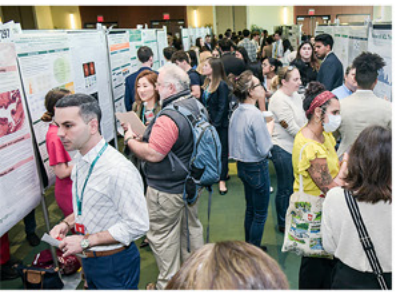

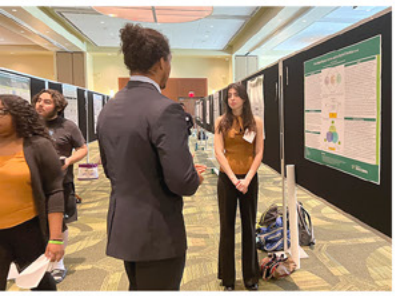

FURC 2025

Florida Undergraduate Research Conference

February 14 – 15, 2025

USF Marshall Student Center

Hosted by

UNIVERSITY of SOUTH FLORIDA

Office of Student Engagement in Research & Innovation (SERI)

Table of Contents

Welcome

Dear Conference Participants:

On behalf of the University of South Florida, I am pleased to welcome you to the 2025 Florida Undergraduate Research Conference. As one of the largest multidisciplinary research conferences in the country, this event reflects the dedication and creativity of undergraduate students across our state who are paving the way for future advancements in a variety of fields.

I also want to extend a special welcome to the Florida Undergraduate Research Association Board of Directors. We were delighted to accept the Association's invitation to host this year's event, as it aligns with our commitment to maximizing the success of our students, to fueling innovation, and to transforming lives.

More than 800 abstracts were accepted from students from across the state to present research posters. In addition to showcasing your hard work, your presence at this conference is an occasion to build connections that will last a lifetime as you network with peers and mentors who share your passion for creating new knowledge. You also will benefit from workshops presented by faculty and staff from Florida colleges and universities, as well as learn about opportunities to advance your education through graduate studies. We are extremely grateful to everyone involved in these activities for sharing their time and expertise.

As a member of the prestigious Association of American Universities—a distinction held by only 3% of all four year-universities in the country—the University of South Florida shares your commitment to advancing knowledge and addressing our society's greatest challenges. I am confident that the insights and innovations that emerge from this conference will contribute significantly to our collective understanding and empower us all to create a healthier future.

Once again, welcome to USF and the Florida Undergraduate Research Conference. I wish you all a productive and inspiring experience.

Sincerely,

Rhea F. Law
President
University of South Florida

Welcome

Dear Students, Colleagues, and Guests:

On behalf of the University of South Florida, I welcome you to the 2025 Florida Undergraduate Research Conference. The Florida Undergraduate Research Conference is a testament to the creativity, curiosity, and perseverance of our undergraduate students across the state. This conference highlights the incredible educational opportunities that equip students with the skills needed to thrive in their careers and contribute as active global citizens.

Congratulations to our student presenters, their teams, and faculty mentors. Your collaboration and guidance are a testament to our shared passion for education, knowledge, and a commitment to the communities we serve.

I also offer my thanks to the Florida Undergraduate Research Association and the USF Office of Student Engagement in Research and Innovation for organizing and facilitating this meaningful opportunity. This conference would also not be possible without the faculty and staff volunteers and mentors. As we come together to celebrate the achievements of these outstanding students, let us recognize that their dedication to research and innovation is paving the way for a brighter future.

I hope you seize every opportunity this conference provides, connect with fellow scholars, and take inspiration from one another. Together, you create a network of scholars highlighting the talent and the strengths of our institutions.

Sincerely,

Prasant Mohapatra

Prasant Mohapatra, PhD
Provost and Executive Vice President of Academic Affairs

Welcome

Welcome to the 15th annual Florida Undergraduate Research Conference (FURC). The University of South Florida is proud to host this state-wide research event in our second year as a member of the Association of American Universities (AAU). USF values the importance of undergraduate research and its role as a high-impact learning experience.

I am grateful to the Office of Student Engagement in Research & Innovation (SERI), which is now part of USF's Research & Innovation organization, for leading the charge of this important conference. We expect to welcome close to 1,000 attendees from Florida's colleges and universities.

Under the leadership of Saundra Johnson Austin, EdD, the SERI staff of Karen Garcia-McGowan, DBA, and Sam Ediger, MLIS, along with dozens of volunteers, have worked diligently to make this one-and-a-half-day event possible. We hope that you plan to take advantage of the 30 workshop presentations that faculty and staff across the State of Florida are presenting on topics that can elevate undergraduate research practice. Additionally, graduate recruiters will be on site to answer questions about attending graduate school. We invite all of you to strengthen your research networks and drive innovation.

Enjoy the conference!

Sylvia W. Thomas

Sylvia Wilson Thomas, PhD
Vice President for Research & Innovation, University of South Florida
President & CEO, USF Research Foundation, Inc.
Professor, Department of Electrical Engineering

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UNIVERSITY of SOUTH FLORIDA

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Conference Schedule

Friday, February 14

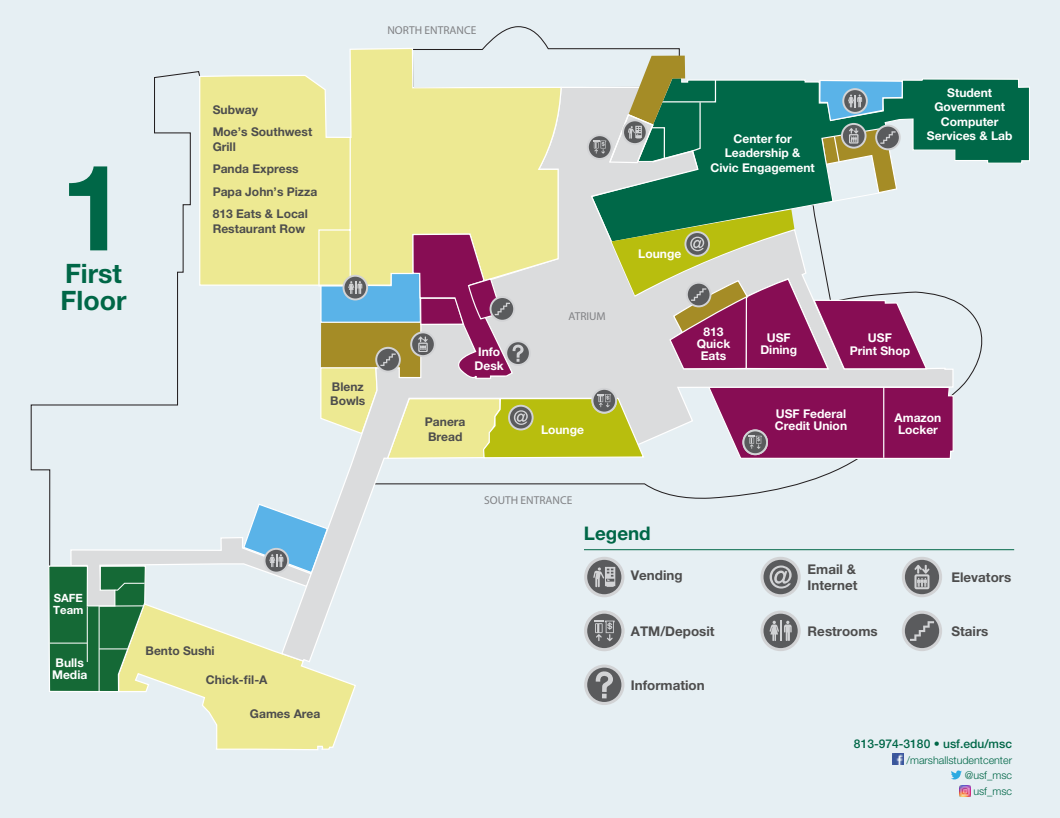
Time	Event
Marshall Student Center (MSC) Atrium	
4:00 p.m. – 8:00 p.m.	Check-In
MSC Ballrooms 2100	
5:00 p.m. – 6:00 p.m.	Reception and Networking
MSC Oval Theater 2500	
6:15 – 7:00 p.m.	Remarks, Mentor of the Year & Entertainment
7:00 p.m. – 8:00 p.m.	Student Panel and Q&A
8:00 p.m.	Dinner on Your Own

Saturday, February 15

Time	Event
MSC Atrium	
8:00 a.m. – 5:00 p.m.	Check-In
9:00 am – 5:00 p.m.	Graduate School Fair
MSC Oval Theater 2500	
8:00 a.m. – 4:00 p.m.	Drop-off/Pick-up posters
MSC Ballrooms 2100	
9:00 a.m. – 9:45 a.m.	Poster Session I
MSC 2nd, 3rd, and 4th floor	
10:00 a.m. – 10:45 a.m.	Workshop 1
MSC Ballrooms 2100	
11:00 a.m. – 11:45 a.m.	Poster Session II
MSC Amphitheater (Outdoors)	
12:00 Noon – 1:00 p.m.	Lunch
MSC Ballrooms 2100	
1:15 p.m. – 2:00 p.m.	Poster Session III
2:15 p.m. – 3:00 p.m.	Poster Session IV
MSC 2nd, 3rd, and 4th floor	
3:15 p.m. – 4:00 p.m.	Workshop 2
MSC Ballrooms 2100	
4:15 p.m. – 5:00 p.m.	Poster Session V

Event Maps

Marshall Student Center



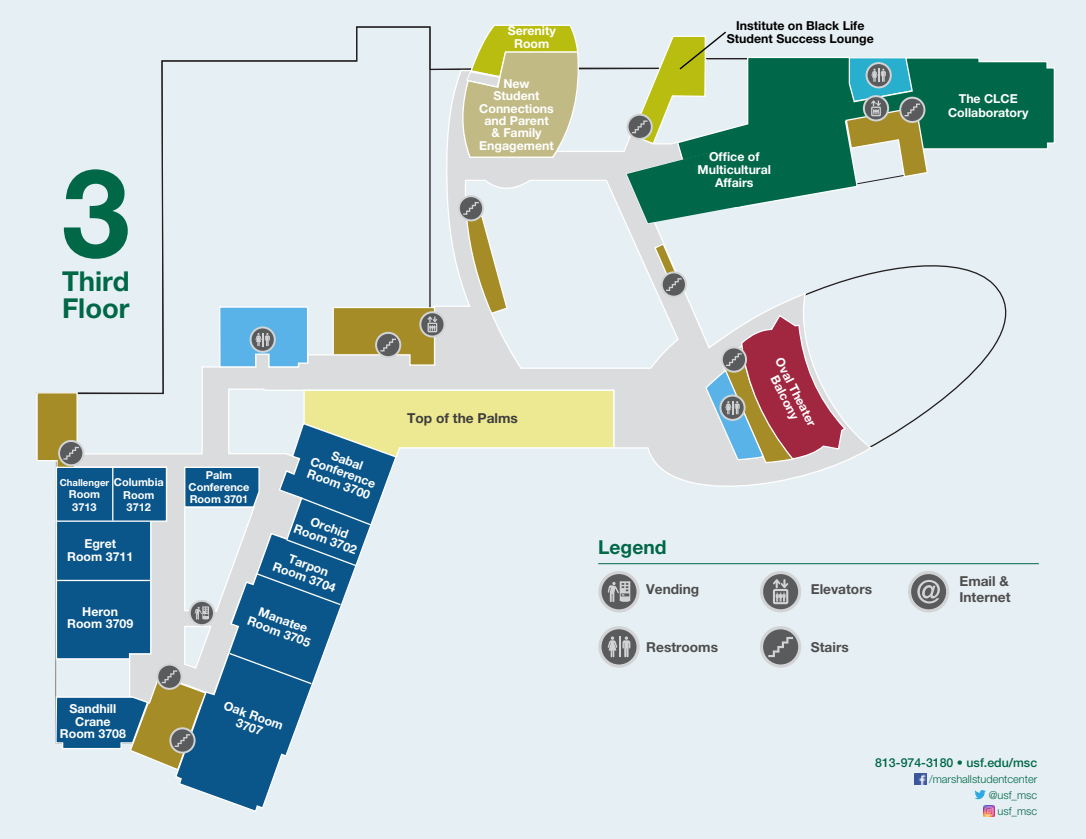
USF Tampa Campus Maps

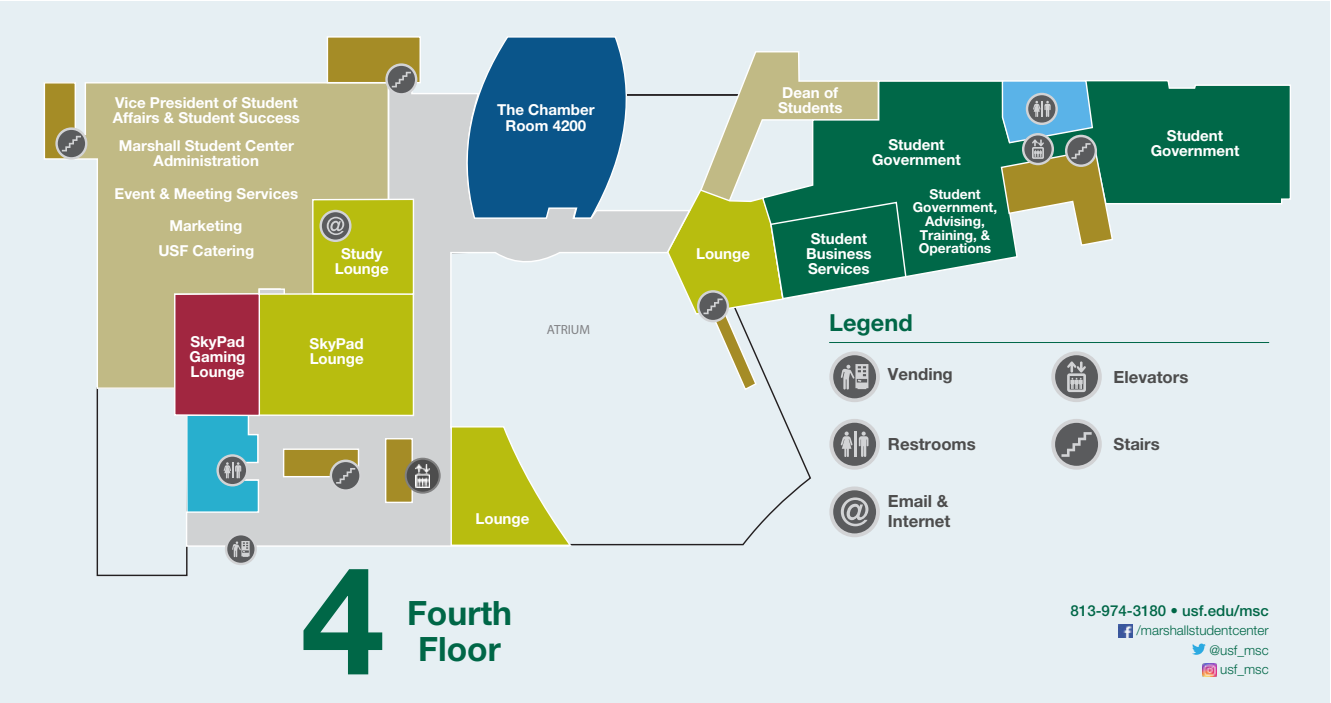
Interactive Map

Parking Map

Event Maps

Marshall Student Center





Mentor of the Year

Florida Undergraduate Research Association's 2025 Faculty Mentor of the Year

Presented by David Reamer, PhD, Associate Professor,
English and Writing, University of Tampa and
Florida Undergraduate Research Association Board Member

Award Recipient: Nancy Diaz-Elsayed, PhD, Assistant Professor, USF

Dr. Nancy Diaz-Elsayed is an Assistant Professor at the University of South Florida in the Department of Mechanical Engineering. She leads the Smart and Sustainable Systems Laboratory (S3 Lab) where her research group applies data-driven methods and leverages IoT technologies to enable the design of sustainable systems. Her projects have spanned discrete and continuous processes, including tool condition monitoring for CNC machining, the characterization of health monitoring capabilities for production equipment, the sustainable design of integrated wastewater management systems, and the development of a digital twin for remote energy monitoring.

For her professional achievements to date and support of the future generation of engineers, she has received several accolades including the 2022 SME Sandra L. Bouckley Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers (SME), a 2022 Luminary Award from Great Minds in STEM (GMiS), and a 2021 William R. Jones Outstanding Mentor Award from the Florida Education Fund (FEF).

Dr. Diaz-Elsayed holds a M.S. and Ph.D. in Mechanical Engineering from UC Berkeley and a B.S. in Mechanical Engineering from MIT.

Message from JM Rahman

Message from JM Rahman, USF Biomedical Sciences, President, Undergraduate Research Society at USF

JM Rahman has a strong passion for medicine and research, particularly in otolaryngology. He intends to attend medical school to further his passion and expertise in hearing and voice disorders. He recently completed a research project on hyperacusis using the Active Avoidance Paradigm under Dr. Joseph Walton at the Global Center for Hearing and Speech Research, where he served as Lead Research Assistant. His study explored the behavioral mechanisms underlying hyperacusis, a debilitating auditory condition affecting sound tolerance.

Beyond this, JM is currently working with Dr. Yael Bensoussan in the Department of Otolaryngology at USF Health, where he advocates for the integration of hearing health in voice data collection for artificial intelligence. His initiative calls attention to the need for incorporating auditory assessments in AI-driven voice research, ensuring that voice biomarkers are analyzed with a more comprehensive understanding of an individual's hearing status. This effort has the potential to improve AI applications in healthcare, particularly in diagnosing and treating speech and hearing disorders.

Fun fact: When he's not in the lab, JM enjoys aviation and holds a sport pilot license.

Student Panel

Keynote Speakers

BULLish on Undergraduate Research: USF Students' Perspective

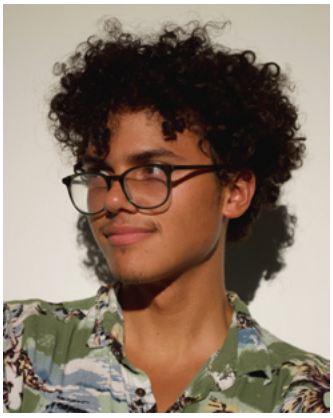
Moderator

Dr. Saundra Johnson Austin, Director, Student Engagement in USF Research & Innovation

Dr. Johnson Austin has dedicated her career to promoting and advocating for student success. She has held leadership positions in secondary, post-secondary, non-profit, industry, engineering public policy, and community development sectors. Her research is grounded in the effective implementation of STEM curricula in middle schools. She is the recipient of The Pennsylvania State University Outstanding Engineering Alumnus Award for Civil and Environmental Engineering. She earned a Bachelor of Science in Civil Engineering from The Pennsylvania State University, a MBA from the University of Notre Dame, and a Doctor of Education in Organizational Change and Leadership from the University of Southern California.

Fun Fact: She enjoys watching the sunset at the beach, yoga, rowing, kickboxing, and Taco Tuesdays!

Panelists



Joseph (Joe) Ambrosino, 4th Year USF student, Political Science and History with a minor in Psychology, and Fulbright Scholar

Joseph has a strong interest in the connections between African American history, mental health, and antiquity. Through this, he has created USF's very first Black Wellness Club, a student organization dedicated to bridging psychological concepts and research to the black experience in America. His passion for history,

Student Panel

and more importantly people, led him to be awarded a Fulbright Scholarship to participate in the Black Humanities Institute at the University of Bristol.

He is an intern at the Institute on Black Life, where under Dr. Ponton's guidance, he researches the history of the KKK in Central Florida. His academic pursuits include participation in the Summer for Undergraduates program at Florida State University College of Law and active roles in the Mock Trial and Debate teams.

Through these skills, Joseph has a firm draw to examine how marginalized communities and traditional ideas of justice and injustice are remediable.

One of Joseph's outlets for this curiosity is involved as the social outreach chair in Stonecatchers, a student organization focused on building more empathetic leadership in all walks of life, and as the Co-Editor-in-Chief for Thread Magazine, where he leads a team of five editors to design literary exhibitions, open-mics, and of course, the magazine volumes.

Fun Fact: In his free time, Joseph practices the piano for his church, skateboards with his brother back home in Lakeland, and helps out with the Judy Genshaft Honors Choir as both Secretary and Bass.

Bethany Jowers, 1st Year USF Master's student, Applied Anthropology, concentrating in Medical Anthropology under Dr. Elena Lesley at the University of South Florida.

Her current research draws from feminist theory and critical medical anthropology to explore overlaps between medicine and policy, with specific focus on reproductive justice and clinical applications. She is also pursuing a graduate certificate in Women's, Gender, and Sexuality studies.

Bethany is an alumna of USF, having completed dual degrees in Biomedical Sciences and World Languages and Cultures in 2024. During her undergraduate studies, she was named the inaugural Student of the Year by the USF Office of Undergraduate Research and the 2024 Ralph C. Wilcox Outstanding Graduate.

Fun fact: Bethany's dream travel location is currently Japan; her partner visited a year ago and she's been jealous ever since!

Student Panel

Brandon Sauval, USF Alum, Bachelor's of Science in Chemistry

Brandon is a native of Palm Beach, Florida. He currently attends Florida State University in pursuit of his PhD in Materials Chemistry. Upon earning his PhD, he is entertaining the idea of pursuing a postdoctoral fellowship with the goal of establishing a lab or company that utilizes in lab chemists and tools of automation and active learning models for commercial low-cost energy materials for people worldwide.

Under his Principal Investigator, Dr. Yan Zeng, his research involves the synthesis of sodium-ion battery materials as disordered rock salts. In addition to energy storage, the lab also utilizes and studies Automation, Machine Learning and Artificial Intelligence as a tool for laboratory work.

Fun Fact: To decompress and relax he recently started playing guitar hero because having a hobby to look forward to after a day's work is essential!

Graduate Recruiters

Graduate School and Research Recruiters

University Recruiters

- Baylor College of Medicine
- Columbia Engineering
- Florida Agricultural & Mechanical University / Florida State University College of Engineering
- Florida Gulf Coast University
- Florida International University
- Florida International University College of Engineering and Computing
- Florida International University Robert Stempel College of Public Health & Social Work
- Florida State University College of Communication and Information
- Florida Undergraduate Research Association
- George Mason University College of Engineering and Computing
- Lynn University
- National Academy of Inventors
- New York University Tandon School of Engineering
- The University of Alabama
- University of Albany State University of New York
- University of Central Florida
- University of Chicago
- University of Florida
- University of North Florida
- University of Rochester
- University of South Florida College of Education
- University of South Florida College of Engineering
- University of South Florida Health Morsani College of Medicine
- University of South Florida Office of Graduate Studies

At USF: Research Experiences for Undergraduates

- National Science Foundation Research Traineeship (NRT) Program for Semiconductors and Microelectronics Technology
- National Science Foundation Cybercorp SFS CREST
- Sloan Research Experiences for Undergraduates
- Research Experience in Functional Materials for Undergraduates in Chemistry

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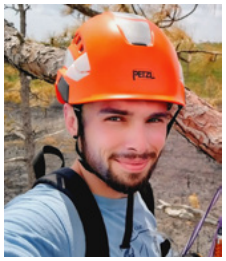
Senior Associate Director
Office of Undergraduate Research and Inquiry
Florida Atlantic University

Kaitlyn Minnicks
Secretary, Executive Board
Coordinator, Office of Undergraduate Research,
University of North Florida

Alicia Batailles
Senior Associate Director
Center for Undergrad Research and Academic Engagement
Florida State University



Dr. Iam Biazzo
Assistant Professor
Environmental Studies
Rollins College

Dr. Daniel Beugnet
Chair, Undergraduate Research Council,
Professor English
Tallahassee State College

Dr. Deborah Bromfield Lee
Associate Professor
Chemistry
Florida Southern University

Dr. Anne Donnelly
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University Of Florida

Shaun Elie
Program Coordinator
Office of Undergraduate Research and Inquiry
Florida Atlantic University

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Dr. Saundra Johnson Austin
Director
Student Engagement in Research and Innovation
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Dr. Alanna Lecher
Associate Professor
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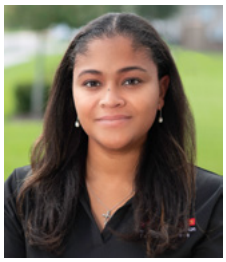
Lynn University

Dr. Mintoo Patel
Instructor, Natural Sciences
South Florida State College

Dr. David Reamer
Dir, Office of Undergrad Research & Inquiry
Assoc Prof, English & Writing
University of Tampa

Amy Reid
Assistant Director
Undergrad Research and Internships, *Florida International University*



Dr. Meloni Sexton
Undergraduate Research Coordinator
Professor Psychology
Valencia College

Dr. Natalia Toro
Director, Office of Undergraduate Research
University of Central Florida

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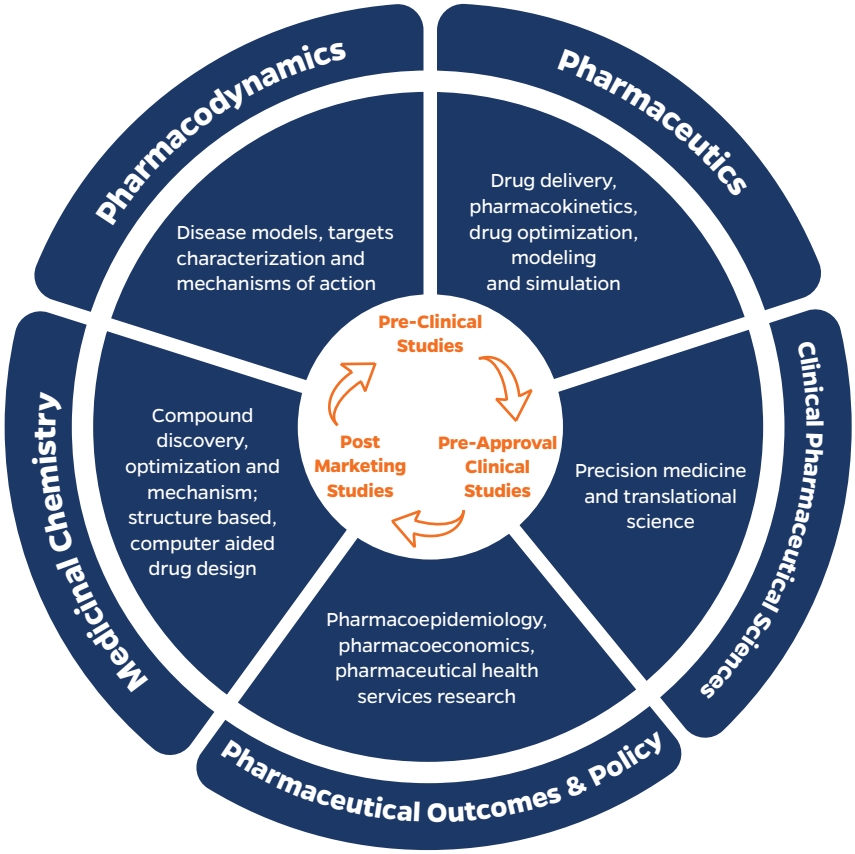

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Workshop Session 1
10:00 a.m. – 10:45 a.m.

Tips for Getting into Undergraduate Research as a Transfer Student
Alicia Batailles, Asli Kaya and Natalia Toro
Room MSC 2702

Creating a Successful Startup Company: Business Model Creation and Validation
Dr. Glenn Whichard
Room MSC 2703

22 DREF Researcher Cohort – NIH All of Us
Dr. Nashika Jackson Ogilvie
Room MSC 2705

Florida Undergraduate Research Journal: Opportunities for Students
Dr. Melodie Eichbauer
Room MSC 2707

Fundamentals of Intellectual Property & Technology Transfer
Michele M. Tyrpak
Room MSC 2708

USF Chemistry Research Experiences for Undergraduates (REU) and Graduate Programs
Dr. Paul Scesa
Room MSC 2709

A Catalyst for Driving Undergraduate Research Forward: Takeaways and Future of the Florida Undergraduate Research Leadership Summit 2025
Sarah Garfield
Room MSC 3701

Frontiers in Aerospace Medicine: Challenges and Innovations in Space Health Research
Natalie Brattain
Room MSC 3702

Breathing in Black Joy: An Actionable Academic Love Letter to Black Undergraduate Students
Dr. Chris Omni, MPH, MLS
Room MSC 3704

Connecting Undergraduate Research to National Scholarships: Why, What, and How
Dr. Sayandeb Basu
Room MSC 3705

Using Artificial Intelligence to Expand Your Voice and Influence
Ray Caputo
Room MSC 3708

Find Your Fit: Discussion on Exploring and Determining Graduate Program
Dr. Ellyn Couillard
Room MSC 3709

Targeting and Selecting Journals for Article Submissions: Library Resources and Impact Measures
Matt Torrence
Room MSC 3711

Social Media Savvy: Building Your Research Impact
Dr. Tracy Costello
Room MSC 3712

Advocacy and Research – Effectively Communicating Your Story
Ronnie Mack
Room MSC 3713

The Art of Research Paper Writing: A Step-by-Step Guide
Olukemi Akintewe
Room MSC 4200

Workshop Session 2
3:15 p.m. – 4:00 p.m.

Your Path to Graduate School & Career Success Starts Today
Betsy Crawford
Room MSC 2702

Straight Paths and Winding Roads: Managing the Unexpected in Research
Marie Mooney
Room MSC 2703

Unlock Your Future: Exploring Graduate Programs at the University of Florida
Erin Rice
Room MSC 2705

Florida Undergraduate Research Journal: Opportunities for Students
Dr. Melodie Eichbauer
Room MSC 2707

Creating a Successful Startup Company: Business Model Creation and Validation
Dr. Glenn Whichard
Room MSC 2708

Research Experiences for Undergraduates in Functional Materials at USF
Dr. Arjan van der Vaart
Room MSC 2709

Role of Mentor in Undergraduate Research and Beyond: Support and Impact Towards Mentee's 360 Success
Vishwa D. Trivedi
Room MSC 3701

Leveraging Social Media for Academic and Professional Success: Strategies for Undergraduate Researchers
Wendy Pioquinto
Room MSC 3702

Making the Most out of Professional Conferences
Dr. Alison Oberne
Room MSC 3704

Converting Undergraduate-Level Research Into Graduate-Level Opportunities in Engineering and Computer Science
Dr. Ali P. Gordon
Room MSC 3708

Find Your Fit: Discussion on Exploring and Determining Graduate Program
Dr. Ellyn Couillard
Room MSC 3709

How to Develop an Innovator's Mindset
Jamie Spurrier
Room MSC 3711

Leveraging AI for Workforce Readiness and Productivity in Your Undergraduate Career
Jenna Molen
Room MSC 3713

Unlock Your Potential: A Guide to Graduate School Applications
Dr. Ruth Bahr and Dr. Tracy Costello
Room MSC 4200

Workshop Session 1 – Descriptions
10:00 p.m. – 10:45 p.m.

Tips for Getting into Undergraduate Research as a Transfer Student

Room MSC 2702
Alicia Batailles and Natalia Toro
Florida State University

As a transfer student, it can be difficult to figure out how to get involved with undergraduate research (UR) at your new institution while getting used to a new campus, procedures, and professors. Yet, if you wait too long, you might miss crucial deadlines for various opportunities, like honors theses, research funding, and national fellowships. This workshop will discuss the unique benefits and challenges of engaging with UR as a transfer student. This workshop will be useful regardless of the institution to which you plan to transfer, and you will leave with tips to help facilitate your own successful transition.

Creating a Successful Startup Company: Business Model Creation and Validation

Room MSC 2703
Dr. Glenn Whichard
University of South Florida

So, you want to be an entrepreneur. How do you convert your research findings and ideas into a sustainable business? Creating a Business Model and engaging in Customer Discovery will give you a better understanding of your customers' needs, and the critical activities you must perform well, thus increasing your probability of creating a successful startup. More startups fail from a lack of customers than from a failure of product development. This presentation describes the Business Model Canvas, which shows the critical components necessary to build a successful startup. The initial focus is on Customer Segments, the people you are trying to serve with your solution, and Value Propositions, the benefits and gains derived from your products.

Customer Discovery, which is the process of collecting information to confirm your initial Business Model Canvas hypotheses, will be discussed. The goal of Customer Discovery is to gather relevant information from potential customers about their needs and purchasing behavior. Conducting Customer Discovery interviews requires practice to ask open ended

questions and appropriate follow-up questions to avoid receiving skewed answers and false insights.

USF teaches this methodology in its National Science Foundation funded I-Corps program. Participants conduct interviews with potential customers and report their findings to instructors who provide feedback aimed at increasing information gathering effectiveness. The goal of the I-Corps program is to assist participants in the creation and validation of their Business Model before they spend time and money developing a product nobody wants.

22 DREF Researcher Cohort – NIH All of Us

Room MSC 2705
Dr. Nashika Jackson Ogilvie
Nova Southeastern University

Learn how one student who participated in the 22 DREF Researcher working group cohort got her university to sign a DURA with the National Institute of Health that expanded the university's research possibilities. According to the Centers for Disease Control and Prevention (CDC), more than 40% of newly diagnosed HIV cases in America are African Americans, and 13% still do not know their status. Florida has the 2nd highest incidence of HIV, and the South Florida Tri-county of Palm Beach, Broward, and Miami Dade was ranked as number 1 in the nation for cases of HIV. A graduate student conducted a regression analysis in the National Institute of Health All of Us Research workbench to prove a hypothesis. The results showed a significant correlation between the high incidence of HIV in the African-American community in Florida and social and structural determinants of health such as income, education, employment, and housing. Research from various disciplines, such as STEM, Arts and Humanities, Business, Medical, and Law, can be conducted using the NIH – All of Us workbench. Members of the 22 DREF Researcher working group have represented three Florida Undergraduate Research Association member universities doing research, publishing work, and being accepted to present at national conferences. This workshop will educate you on the NIH All of Us Workbench, guide you through getting a DURA, and provide the next steps.

Florida Undergraduate Research Journal: Opportunities for Students

Room MSC 2707
Dr. Melodie Eichbauer
Florida Gulf Coast University

The engagement of undergraduate students in research is undeniably on the rise. As more students engage in research, the quality of that research is also increasing and becoming more substantive. These students are undertaking their research both with and independent of their faculty mentor. Depending on the discipline, however, opportunities to publish in journals dedicated to their field of study can be limited. A great number of students are limited to publishing in their university student research journal. Furthermore, students are left out of the publication process and thus have no exposure to professional opportunities, such as peer review, copy editing, and project management.

This workshop focuses on a new effort to address both the publication and professionalization opportunities available to students. This presentation will highlight the Florida Undergraduate Research Journal (FURJ), which is a new publication opportunity for students to share their work with others beyond their campus journals, and the opportunities for students. This journal is an interuniversity collaboration that provides opportunities that go beyond the individual campus journals. It is an explicit collaboration between students and faculty at all stages of the publication process. Students can publish as sole author or in collaboration with other students. Publication opportunities offer students the experience of what goes into disseminating their work in print. Throughout the publication process, student-authors will receive constructive feedback and comments at each stage of the process to foster their research and writing skills as submissions will undergo a tiered review process that assesses the focus of the question, the content, the methodology, and the audience; followed then by a review of the content by those dedicated and committed to high-quality student research. Submissions undergo a tiered review process comprising of a state-wide Student Editorial Board and a faculty reviewer both of whom use a rubric. The Student Editorial Board thus participates in mentorship and professionalization opportunities by engaging in project management, communication, and review. They will participate in monthly board meetings on Zoom, review submissions to see if they are appropriate for disciplinary review, arrange for faculty or graduate students to conduct a disciplinary review, and create an image for the volumes cover. The opportunities provided are critical to future success in academics and/or with employers.

Fundamentals of Intellectual Property & Technology Transfer

Room MSC 2708
Michele M. Tyrpak
University of South Florida

This presentation will address the essential principles of intellectual property (IP) and their pivotal role in fostering innovation and driving economic growth. It will elucidate the core concepts of IP, encompassing patent, trademark, and copyright protection. The discussion will then shift to the critical function of university technology transfer offices (TTOs) in the management and commercialization of IP assets.

Key aspects of TTOs to be explored include:

- Their primary responsibilities and operations
- The step-by-step process they employ
- The advantages of collaborating with these offices

By examining these topics, the presentation aims to provide a comprehensive understanding of how intellectual property is protected and leveraged within academic institutions to benefit both the creators and society at large.

USF Chemistry Research Experiences for Undergraduates (REU) and Graduate Programs

Room MSC 2709
Dr. Paul Scesa
University of South Florida

This talk presents two exciting opportunities for undergraduate students: the USF Department of Chemistry summer REU Program and the Chemistry Graduate Program. The REU program offers a 10-week, research immersion experience for undergraduate students to advance the understanding, design, creation and isolation of molecules with tailored and desirable properties. REU students will learn critical research skills in the laboratory, while workshops will impart key knowledge on scientific communication, research careers, and laboratory safety. In collaboration with the National Academy of Inventors, workshops will be given on intellectual property and entrepreneurship. Participants will receive a weekly stipend and free housing on campus; socials and field trips will be organized.

The Chemistry Graduate Program at USF is an outstanding opportunity for an advanced degree in a research-intensive setting. Our department consists of numerous faculty members with a broad research focus, including groups dedicated to biological, computational, materials and synthetic chemistry. Researchers in our program have extensive access to state-of-the-art instrumentation and resources including those for high performance computing, mass spectrometry, nuclear magnetic resonance and X-ray crystallographic techniques. This setting allows our graduate students to receive advanced degrees which represent considerable expertise in modern scientific methods, making them highly competitive individuals for the current-day job market.

A Catalyst for Driving Undergraduate Research Forward: Takeaways and Future of the Florida Undergraduate Research Leadership Summit 2025

Room MSC 3701

Sarah Garfield, Tushar Desaraju and Dominque Keyes
University of Florida

The Florida Undergraduate Research Leadership Summit (FURLS), the nation's first student-led research conference, catalyzes student-driven innovation by creating a platform for undergraduate researchers to collectively enhance the academic research environment. As we united institutions through a planning committee with student representation across various Florida campuses, we successfully connected, collaborated, and advanced research while fostering a sense of community. The University of Florida, in collaboration with the Center for Undergraduate Research Board of Students (CURBS), hosted FURLS from January 31st through February 1st.

The two-day event consisted of an evening reception and keynote speaker on Friday night, followed by Saturday's full schedule of networking activities, student-led workshops, and interactive roundtable discussions. This workshop is designed for undergraduate researchers and event coordinators interested in organizing impactful student-led conferences. It provides an in-depth overview of FURLS, highlighting its history, goals, themes, and the planning process that contributes to its success. It will also cover methods for securing financial support and managing event costs through registration. Additionally, we will discuss workshops, Q&A takeaways, and explore improvements for future informational sessions and programming. We will conclude with a brainstorming activity that identifies strategies for the ongoing improvement of FURLS with a focus on future opportunities that expand the conference's impact and outreach. By highlighting

actionable approaches to creating an immersive and impactful event and equipping participants with the knowledge to thrive, we demonstrate how the achievements of FURLS can serve as a model for continuous growth and success in advancing undergraduate research culture.

Frontiers in Aerospace Medicine: Challenges and Innovations in Space Health Research

Room MSC 3702

Natalie Brattain and Ashley Lunt
Embry-Riddle Aeronautical University

Undergraduate researchers are key contributors to the evolving field of aerospace medicine, addressing the unique challenges of human space exploration. This workshop, "Frontiers in Aerospace Medicine: Empowering Undergraduate Research for Space Health," provides a collaborative space to explore the contributions of undergraduate research in solving critical space health issues.

The session begins with an overview of aerospace medicine, emphasizing how student-led projects tackle challenges such as microgravity-induced physiological changes, radiation exposure, and behavioral health in isolated environments. Participants will hear about innovative undergraduate research at Embry-Riddle Aeronautical University.

Interactive activities will engage attendees in thought-provoking discussions and group brainstorming. Participants will be invited to work together to design research approaches for addressing specific space health challenges like Spaceflight-Associated Neuro-Ocular Syndrome (SANS) or the impact of microgravity on muscle and bone health. Through these discussions, attendees will collaborate to refine research questions, propose experimental designs, and identify potential research methodologies that undergraduate students can realistically pursue.

The workshop will conclude with a focus on how undergraduates can secure research opportunities, navigate the grant application process, and build connections in aerospace medicine. Participants will leave with actionable insights on how to advance their own research in this field and make meaningful contributions to space health.

Breathing in Black Joy: An Actionable Academic Love Letter to Black Undergraduate Students

Room MSC 3704
Dr. Chris Omni, MPH, MLS
Florida State University

Breathing in Black Joy was designed by Dr. Chris Omni and based on her award-winning dissertation, "Black Joy in Green Spaces: A Nature-inspired, Endarkened Visual Narrative Inquiry about Black Women and Joy." Dr. Omni created this a-typical workshop as an actionable academic love letter to Black undergraduate students because she knew that the effort Black people poured into achieving their various levels of personal and professional success did not directly equate to any greater protective factors when it came to their overall health outcomes (McGee, 2015). With this knowing, she made it her mission to curate moments of health and wellbeing within academic spaces. Moments that amplified Black joy as it explored the power of breathwork.

Breathing in Black Joy serves as an invitation to press pause on the demands of the day. It provides an opportunity to practice self-restoration exercises. Most importantly, it grants permission to engage in the art of simply BE-ing. This adaptive experience will be taught both standing and seated. **Breathing in Black Joy** provides attendees with three key takeaways:

1. A better understanding of the six pillars of Black Joy
2. An introduction to art of chakra breathing
3. An introduction to Dr. Omni's Kujima (pronounced koo-gee-mah) Theory of Collective-Self Motivation. Kujima (KOO-gee-Mah) is a term blended from the fusion of various principles found within the African American celebration of Kwanzaa (pronounced "kwahn-zuh"):

   Kujichagulia (self-determination)
   Kuumba (creativity)
   Ujima (collective work and responsibility)

Worth noting: While understanding that all attendees may not identify as Black, this workshop is also for those who want to bear witness to the power of voice and agency of a Black woman.

Connecting Undergraduate Research to National Scholarships: Why, What, and How

Room MSC 3705
Dr. Sayandeb Basu
University of South Florida

Participation in Undergraduate Research is a way to enrich one's journey in college. Research experience opens up new ways to think about some of the world's greatest challenges across all majors and disciplines. Research products such as presentations and publications also makes a student's profile compelling and competitive for postgraduate studies. This talk will thread an arc connecting undergraduate research to next-steps after FURC and onward toward planning for competitive national and international awards that support graduate studies nationally and globally. It will cover finding enhanced research opportunities through NSF funded Research Experience for Undergraduates (REUs), the nuances to wining a Barry Goldwater scholarship for excellence in undergraduate research as a sophomore or junior and thence to major awards supporting graduate studies in the United Kingdom and the USA. The talk will specifically stress the power of narratives that compel reviewers, and how these narratives emerge from and are shaped through undergraduate research experiences.

Using Artificial Intelligence to Expand Your Voice and Influence

Room MSC 3708
Ray Caputo and Asya Muldrow
Bethune-Cookman University

This interactive workshop explores how one specific type of artificial intelligence (AI), voice-generated artificial intelligence, can expand personal and professional capabilities. As the use of voice-generated AI becomes more widespread, there are unprecedented opportunities for students and practitioners to transcend communication barriers and enhance their global reach. The workshop demonstrates practical applications including real-time voice translation, historical voice recreation, and personalized content generation in the user's own voice.

Special attention will be given to ethical considerations, particularly regarding voice cloning and historical figure recreation. The session will also contextualize voice-generated AI within the broader AI ecosystem, highlighting its complementary relationship with other AI applications that enhance human capabilities.

By the workshop's conclusion, participants will understand how to leverage these emerging technologies to amplify their voice and influence across linguistic, temporal, and cultural boundaries.

Find Your Fit: Discussion on Exploring and Determining Graduate Program

Room MSC 3709
Dr. Ellyn Couillard
University of South Florida

The workshop's objective is for participants to understand the various types of graduate education and how to determine which best fits their goals, academic interests, and personal circumstances and how to capitalize on their current research pursuits to support their decisions. The presentation would start with an overview of different types of graduate education programs (certificate, master's, doctoral, and professional). Then, participants will engage in a few reflective questions to assess their goals, interests, and circumstances. The presenter will then discuss the common decision-making factors students might consider when deciding whether, when, where, and for what level to pursue graduate education based on current research trends. These factors include career path, program requirements (including structure and modality), completion time, faculty access, diversity, fiscal concerns, reputation, and balance with life considerations. The presenter will also discuss how these junior researchers can capitalize on their present research experiences to help inform their decisions. The students attending the Florida Undergraduate Research Conference demonstrate a capacity for research and post-baccalaureate education. However, the decision to attend graduate or professional school is significant; the amount of time, effort, energy, and money that follows that decision can be incredibly extensive. Therefore, it is essential to provide them an opportunity to learn about the types of education they can pursue, reflect on themselves and their prospective futures, and factors for their consideration regarding possible graduate programs.

Targeting and Selecting Journals for Article Submissions: Library Resources and Impact Measures

Room MSC 3711
Matt Torrence and Allison Symulevich
University of South Florida

This workshop will provide an overview of journal metrics and rankings in all academic fields, including traditional impact measures from sources including the Web of Science (Impact Factor) and Scopus (CiteScore) databases. Additionally, general information will be

offered regarding other additional academic impact databases and methods to maximize benefit of any information on journal, author, and subject area data points. Other impact measures will be presented, including Altmetrics tools. Presenters will introduce other topics on relevant author profile and archiving options for immediate and future use, including ORCiD and examples based on the USF Libraries' Digital Commons repository.

Social Media Savvy: Building Your Research Impact

Room MSC 3712
Dr. Tracy Costello
University of South Florida

Come learn how to leverage social media, particularly LinkedIn, to build a strong online presence as a research scholar. We will provide guidance on how to create a professional LinkedIn profile, how to showcase your research expertise, and how to network with peers and potential mentors. By attending, you'll gain valuable skills to enhance your professional visibility, expand your network, and increase your impact in research.

Advocacy and Research – Effectively Communicating Your Story

Room MSC 3713
Ronnie Mack
Embry-Riddle Aeronautical University

Science communication is defined as, "the processes by which the culture and knowledge of science are absorbed into the culture of the wider community" (Mason & Merga, 2019; Bryant, 2003). In a 2021 study, out of 8,800 respondents only 57% stated science has a "mostly positive" impact on society (Viswanathan, 2023). Due to various factors, research is not effectively communicated to audiences outside the science community. In today's dynamic social landscape, access to accurate information empowers individuals, leaders, and organizations to make informed decisions. While researchers generate valuable knowledge, effectively communicating it to diverse audiences remains a significant challenge. This session presents actionable insights for researchers navigating information curation for wider engagement. By mastering effective communication strategies, researchers can transcend the constraints of scholarly journals, generating awareness across various markets and fostering collective advocacy for impactful local and federal policies. Remember, clear and concise communication bridges the gap between research and real-world impact, leading to positive change on both local and national levels.

The Art of Research Paper Writing: A Step-by-Step Guide

Room MSC 4200
Olukemi Akintewe
University of South Florida

Undergraduate research offers a unique opportunity to develop critical thinking, communication, and project management skills that extend beyond academia. This workshop will provide actionable strategies for students to maximize their research experience across disciplines, from STEM to Arts and Humanities, Business, and beyond. Participants will explore techniques for effectively communicating research findings to diverse audiences, leveraging research experience for internships and graduate school applications, and securing funding for projects. The session will include interactive exercises and real-world examples to empower students to navigate the research process, build professional networks, and articulate the broader impact of their work. Designed to be inclusive and engaging, this workshop will inspire students to see research as a launchpad for their academic and professional journeys.

Workshop Session 2 – Descriptions
3:15 p.m. – 4:00 p.m.

Your Path to Graduate School & Career Success Starts Today

Room MSC 2702
Betsy Crawford
Florida State University College of Communication & Information

As an undergraduate student involved in research, you are already a strong candidate for competitive graduate school programs. Learn how earning a graduate degree can support career success and the steps to take now to boost your application. The workshop includes an overview of resources available to create an outstanding application and a preparation timeline that will keep you ahead of the game.

Straight paths and winding roads: Managing the unexpected in research

Room MSC 2703
Marie Mooney
University of North Florida

Have you ever had your best-laid plans suddenly up-ended by an unanticipated challenge? Maybe you planned on zooming through college and on to a PhD or medical school, but then an illness or accident extended your 4-year degree to 8-years? Or perhaps you took a highly coveted position, only to find out you hated the work? In this workshop on resiliency, we investigate support you can build into your education and career path so that no matter what comes your way, you can overcome obstacles and build forward. We'll look at how to overcome poor performance, re-enter training programs or the workforce after disruptive or traumatic events, identify opportunities to enter new fields, and build confidence in defining your own, unique winding path.

Unlock Your Future: Exploring Graduate Programs at the University of Florida

Room MSC 2705
Erin Rice
University of Florida

Are you ready to take the next step in your academic journey? Join us for an engaging workshop introducing undergraduate students to the exciting world of graduate education

at the University of Florida (UF). Discover how UF's diverse range of graduate programs, world-class faculty, and cutting-edge research opportunities can help you achieve your academic and career goals.

This session will cover key topics such as program options, funding opportunities, admissions requirements, and campus resources tailored to support graduate students. You'll also gain insights into what makes UF a top destination for graduate education, with a focus on how we empower students to thrive academically, personally, and professionally.

Whether you're just starting to think about graduate school or planning your next steps, this workshop will provide valuable information and resources to guide your journey. Don't miss this opportunity to learn more about becoming part of the Gator Nation!

Florida Undergraduate Research Journal: Opportunities for Students

Room MSC 2707
Dr. Melodie Eichbauer
Florida Gulf Coast University

The engagement of undergraduate students in research is undeniably on the rise. As more students engage in research, the quality of that research is also increasing and becoming more substantive. These students are undertaking their research both with and independent of their faculty mentor. Depending on the discipline, however, opportunities to publish in journals dedicated to their field of study can be limited. A great number of students are limited to publishing in their university student research journal. Furthermore, students are left out of the publication process and thus have no exposure to professional opportunities, such as peer review, copy editing, and project management.

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at each stage of the process to foster their research and writing skills as submissions will undergo a tiered review process that assesses the focus of the question, the content, the methodology, and the audience; followed then by a review of the content by those dedicated and committed to high-quality student research. Submissions undergo a tiered review process comprising of a state-wide Student Editorial Board and a faculty reviewer both of whom use a rubric. The Student Editorial Board thus participates in mentorship and professionalization opportunities by engaging in project management, communication, and review. They will participate in monthly board meetings on Zoom, review submissions to see if they are appropriate for disciplinary review, arrange for faculty or graduate students to conduct a disciplinary review, and create an image for the volumes cover. The opportunities provided are critical to future success in academics and/or with employers.

Creating a Successful Startup Company: Business Model Creation and Validation

Room MSC 2708
Dr. Glenn Whichard
University of South Florida

So, you want to be an entrepreneur. How do you convert your research findings and ideas into a sustainable business? Creating a Business Model and engaging in Customer Discovery will give you a better understanding of your customers' needs, and the critical activities you must perform well, thus increasing your probability of creating a successful startup. More startups fail from a lack of customers than from a failure of product development. This presentation describes the Business Model Canvas, which shows the critical components necessary to build a successful startup. The initial focus is on Customer Segments, the people you are trying to serve with your solution, and Value Propositions, the benefits and gains derived from your products.

Customer Discovery, which is the process of collecting information to confirm your initial Business Model Canvas hypotheses, will be discussed. The goal of Customer Discovery is to gather relevant information from potential customers about their needs and purchasing behavior. Conducting Customer Discovery interviews requires practice to ask open ended questions and appropriate follow-up questions to avoid receiving skewed answers and false insights.

USF teaches this methodology in its National Science Foundation funded I-Corps program. Participants conduct interviews with potential customers and report their findings to instructors who provide feedback aimed at increasing information gathering effectiveness.

The goal of the I-Corps program is to assist participants in the creation and validation of their Business Model before they spend time and money developing a product nobody wants.

Research Experiences for Undergraduates in Functional Materials at USF

Room MSC 2709
Dr. Arjan van der Vaart
University of South Florida

The Research Experiences for Undergraduates (REU) in functional materials at the University of South Florida in Tampa provides a 10-week, research immersion experience for undergraduate students. Our National Science Foundation and Semiconductor Research Corporation sponsored program will inspire and engage a new generation of chemists in a stimulating and diverse environment. Participants will advance the understanding, design, creation and isolation of molecules with tailored and desirable properties. REU students will learn critical research skills in the laboratory, while workshops will impart key knowledge on scientific communication, research careers, and laboratory safety. In collaboration with the National Academy of Inventors, workshops will be given on intellectual property and entrepreneurship. The program will end with a campus-wide symposium. The USF Chemistry Department has a vibrant culture of undergraduate research and faculty have long and successful track records of mentoring undergraduate students. Participants will receive a $700 weekly stipend and free housing on campus; socials and field trips will be organized. We will discuss available research projects, workshops and program, application process and eligibility requirements.

Role of Mentor in Undergraduate Research and Beyond: Support and Impact Towards Mentee's 360 Success

Room MSC 3701
Vishwa D. Trivedi
Bethune Cookman University

Significance of undergraduate research exposure and experiences for students is well-documented. Moreover, the professional and personal growth students attain is dependent upon high-quality and effective mentoring. Mentors in undergraduate research play a significant role in stimulating their student's intellectual capability. It further advances mentee's aspirations ranging from graduate, professional programs to marketplace opportunities. Undergraduate research is an apprenticeship, where mentors teach, build

and test hypotheses while engaging mentees to address the core concern of a problem. Besides training, mentors take extreme measures to navigate the undergraduate mentee for the next step towards career building. The success of any such goal (graduate, professional, etc., along with scholarship) lies under the true assessment of the mentor in the form of a letter of recommendation. Such a testament is vital for the process as a true litmus test. It is just a beginning of bonding, as such relationships last long after degree completion and ultimately transform into strong professional interactions. This workshop will outline the need and growth of such bonding. Workshop would provide resources and interactive activities and a checklist to highlight the key pillars of mentorship. Workshop will focus on the 4 C's of mentorship, namely communication, clarity, commitment and collaboration. We plan to highlight each element using a series of activities, including crosswords, interactive game scoring, etc. Primarily it would assist participants to develop a strong collaboration with mentors. Undergraduate participants will be in the center of this workshop with a connection to mentors. Both mentor and mentee actively participate, combining their strengths and perspectives to achieve the mentee's goal. As we explore the facets of mentoring, we unravel its profound impact on shaping individuals into confident, capable, and accomplished professionals.

Leveraging Social Media for Academic and Professional Success: Strategies for Undergraduate Researchers

Room MSC 3702

Wendy Pioquinto and David Montez
Florida State University

This presentation is designed to offer undergraduate researchers practical strategies to use social media platforms, such as LinkedIn and ORCID, as tools for showcasing academic achievements and building a professional network. Students will learn how to create compelling profiles that highlight research projects, skills, and career goals while effectively communicating their readiness for graduate programs or workforce opportunities. The session also emphasizes the importance of networking, providing tips on connecting with faculty, alumni, and industry professionals to uncover research collaborations, mentorships, and other opportunities. By leveraging social media features, students can enhance their visibility, build meaningful connections, and position themselves for success in their academic and professional journeys.

Making the Most out of Professional Conferences

Room MSC 3704
Dr. Alison Oberne
University of South Florida

Undergraduate students who participate in research often have opportunities to present their research at professional conferences. Attending professional conferences can be overwhelming for first-time attendees. To support students' success in navigating professional conferences, this presentation will focus on best practices when attending these events. The workshop will focus on providing students with the technical and interpersonal skills necessary for success.

The workshop will focus on three key goals:

1. Preparing for the conference: This discussion will emphasize best practices for reviewing program agendas, identifying critical sessions, travel logistics, and packing for the conference.
2. Networking at conference events: This discussion will include practical skill development such as how to craft an elevator pitch and opportunities to role play with peers.
3. Following up with contacts: This discussion will describe when and how to re-connect with potential faculty mentors or future employers.

Upon conclusion of the workshop, students should feel confident when attending professional research conferences, allowing them to thrive both academically and professionally.

Converting Undergraduate-Level Research Into Graduate-Level Opportunities in Engineering and Computer Science

Room MSC 3708
Dr. Ali P. Gordon
University of Central Florida

Congratulations on reaching the stage at which your research findings are presentable. What are the next steps? What other opportunities are available to you? Have you ever wondered how some undergraduate students are able to leverage their success in research to access graduate-level opportunities? With regards to engineering and computer science graduate programs, the answers reside with graduate faculty and the graduate program directors who represent them. While they are looking for the very

best and brightest undergraduate students to populate graduate programs, they are also searching for specific attributes based on the needs of the program. This engaging presentation details how undergraduate research students can curate their activities leading up to graduation and their interactions with graduate program points of contact for maximum impact. This seminar also overviews the distinctive types of graduate-level opportunities available to undergraduate students.

Find Your Fit: Discussion on Exploring and Determining Graduate Program

Room MSC 3709
Dr. Ellyn Couillard
University of South Florida

The workshop's objective is for participants to understand the various types of graduate education and how to determine which best fits their goals, academic interests, and personal circumstances and how to capitalize on their current research pursuits to support their decisions. The presentation would start with an overview of different types of graduate education programs (certificate, master's, doctoral, and professional). Then, participants will engage in a few reflective questions to assess their goals, interests, and circumstances. The presenter will then discuss the common decision-making factors students might consider when deciding whether, when, where, and for what level to pursue graduate education based on current research trends. These factors include career path, program requirements (including structure and modality), completion time, faculty access, diversity, fiscal concerns, reputation, and balance with life considerations. The presenter will also discuss how these junior researchers can capitalize on their present research experiences to help inform their decisions. The students attending the Florida Undergraduate Research Conference demonstrate a capacity for research and post-baccalaureate education. However, the decision to attend graduate or professional school is significant; the amount of time, effort, energy, and money that follows that decision can be incredibly extensive. Therefore, it is essential to provide them an opportunity to learn about the types of education they can pursue, reflect on themselves and their prospective futures, and factors for their consideration regarding possible graduate programs.

How to Develop an Innovator's Mindset

Room MSC 3711
Jamie Spurrier and Dr. Victoria Stuart
University of South Florida

Do you have an innovator's mindset? As you enter a future defined by rapid technological advancement and complex global challenges, cultivating an innovative mindset is

essential—not only for your research, but also for your career. This presentation explores strategies to develop the key traits of an innovator's mindset—curiosity, creativity, resilience, and collaborative thinking—within the academic research context. The session is designed to empower students to navigate uncertainty, approach problems with creativity, and translate ideas into impactful solutions.

Follow the journey of innovation, which will include inspiring examples of Florida researchers/innovators who overcame adversity (e.g., disability, disadvantages, failures, challenges) to become successful leaders and innovators. Learn the nuances of interdisciplinary, multidisciplinary, and trans-disciplinary research and why collaboration and encouraging diverse perspectives are key components in successful research.

Strategies to overcome fear of failure will be highlighted, focusing on how resilience can transform setbacks into opportunities for growth and developing effective solutions. Through interactive team activities, participants will learn the value of diverse perspectives in collaborative environments, showcasing how interdisciplinary teamwork fosters innovation.

By the end of the session, you will gain insights into how you can embrace experimentation, cultivate a growth mindset, develop their creative and critical thinking, and apply innovative approaches to their academic work as well as their career goals.

Leveraging AI for Workforce Readiness and Productivity in Your Undergraduate Career

Room MSC 3713
Jenna Molen and Marquise McGriff
University of Florida

In this presentation, participants will gain a comprehensive understanding of Artificial Intelligence (AI) and its transformative role in today's digital landscape. We will explore how Large Language Models (LLMs) work, shedding light on their underlying mechanisms to help students develop an ethical framework for use. Attendees will also analyze the far-reaching impact of AI on the workforce, including both the opportunities and challenges it presents in the hiring process and the nature of work across various industries. Finally, the session will focus on practical strategies for leveraging AI tools to enhance productivity and foster academic success, equipping participants with actionable insights to integrate AI into their professional and educational pursuits. By the end of this session, attendees will be empowered to navigate the evolving AI landscape with confidence and purpose.

Unlock Your Potential: A Guide to Graduate School Applications

Room MSC 4200
Dr. Ruth Bahr and Dr. Tracy Costello
University of South Florida

This session will equip you with the knowledge and strategies you need to successfully navigate the graduate school application process. We will discuss why you should consider going to graduate school, how to identify a program that will align with your interests, and tips to prepare your application materials. By attending, you'll gain a competitive edge, increase your confidence, and take a crucial step towards achieving your academic and career goals.

Poster Session I
9:00 a.m. – 9:45 a.m.

Implication of nitric oxide (NO) signaling in Staphylococcus aureus
A'mya Chin

Characterization of Tetratricopeptide Proteins in Borrelia Burgdorferi
Aaditya Balasubramaniyan

The Home Clinic: Development of Highly Reproducible Paper Sodium ISE for Home Testing
Aaron Markowitz & Henry Lopez

Novel Synthesis and Magnetic Properties of van-der-Waals Material PrOI
Aashutosh Pokharel

Evolutionary Optimization of Biologically-Inspired Mechanistic Input-Output Neural Circuit Models in the Auditory Pathway
Abdul-Malik Zekri

The effects of bilirubin on intrinsic apoptotic pathways in MDA 231 epithelial breast cancer cell lines
Abigail Francis & David Mejia

Standard in the Rinse
Abigail J. Crossman

The Effects of Blue and Green Crab Grazing on Eelgrass Transplants in Sage Lot Pond, Waquoit Bay
Abigail Kauke

Anthropogenic Disturbance Affects the Presence of Antibiotic-Resistant Salmonella in Urban Birds
Abigail Kirkpatrick & Alexa Pappalardo

Rover Wheel Trafficability and its Impact on Reflectance Spectra and Thermal Distribution of Engineering-Grade Lunar Highlands Regolith Simulant (LHS-1E)
Abigail S. Glover & Myles Hoskinson

Exploring Amplitude-Induced Variability in the Tree Shrew Visual Cortex: A Computational Approach
Abigail Shepard

The Seasonal Distribution of Polycera hummi in Tampa Bay
Abigail Wilson & Grace Ferguson

Electromyographic Prostheses: A Novel Approach to Evaluate and Train Multi-gesture Controls
Abrianna Lalle

Investigating the Role of Net1 in Motor Exit Point Myelination
Addison Manofsky

Effect of Excess Ca(OH)2 on Initiation of Localized Corrosion of the Steel in a Concrete
Adelia Abdykerimova

Identifying the Link Between Traumatic Brain Injury and Alzheimer's Disease
Aditi Gorthy

Importance of the Pregnant Women's Microbiome to Developing Fetuses
Adrienne Ulany Perez

A Novel Multi-Epitope Vaccine against Clostridioides difficile surface proteins
Adrit Roy

Modulation of Actin Filament Assembly and Mechanics with Gold Nanoparticles
Ahad Ansari

Isolation, Cultivation, and Genomic Characterization of Marine Malassezia from Chondrilla nucula in Tampa Bay
Aidan Elliot

Does neural activation differ between logical and non-logical individuals when identifying fake news, and which group demonstrates greater accuracy?
Ailliy A Garcia

Enhancing the Efficacy of Adoptive T Cell Therapy for Patients with Diffuse Large B-Cell Lymphoma by Ablating Galectin-3–Ligand Interactions
Aizada Berdalinova

Poster Session I
9:00 a.m. – 9:45 a.m.

Evaluating the Healthiness of Lifestyle Features Among College Students: A Judgment Analysis
Akshitha Nimmagadda Sai

Investigating the bi-directional relationship between "high" vs. "low" church experiences and self-transcendent positive emotions
Alanna Allion & Sabrina A. Barella

Investigating Plasmid Diversity in the Bacterial Plant Pathogen Xanthomonas perforans
Albert Sunny

Prevalence and Identification of Microplastics in the Lungs
Alberto Chaves

Lane Detection in Self-Driving Cars: A Neural Network Approach to Accuracy and Speed
Aldridge Kalenga & Buchizya Mwase

Impact of STAT3 Inhibition on Tumour Progression and Immune Evasion in Non-Small Cell Lung Cancer
Alejandra P. Santos Ginorio

Towards a curated psychological research database of object and animal images created by generative artificial intelligence
Alejandro Ibarra

Social Comparison Targets and Topics: Domains of Upward and Downward Comparison Across Social Media Platforms
Aleksandra Masiulis

Examining the Correlation Between Swimming Force, Lower-Body Strength, and Power Metrics in Collegiate Swimmers
Alessia Claassen & Claudia Ashford

The impact of academic entitlement, including EXTERNALIZED RESPONSIBILITY and ENTITLED EXPECTATIONS, on a college student's academic success.
Alessia Zedde

Tsallis Entrophy and Seismic Events: An Examination of Chile's Earthquakes Activity
Alex Vazquez

The State of Investing
Alexander Aranda

Data-Driven Patient Allocation Optimization with Epidemic and Vaccine Modeling
Alexander DeLise

Does the Order Of Questionnaire Administration Affect the Covariance of Socioeconomic Indicators
Alexandra Gilmore

Reshaping Labor Advocacy: The OCAW, Global Alliances, and Environmental Justice in the BASF Lockout
Alexis Persbacker

Novice Weightlifters Bench Press Performance During Visual Occlusion and Social Facilitation
Alexis Smith & Ian Jimenez

Heart Rate Variability Differences Throughout the Menstrual Cycle
Alicia M Kralik & Delaney McDermott

Commuting with Your Blood Pressure
Alicia Reynolds

A Survival Horror Video Game's Impact on Visual Attention
Alicia Sprague

Striae in Cushing's Disease: Exploring Glucocorticoid Pathways and Therapeutic Targets
Alina Jacob

Neuromarketing: Understanding College Student Perceptions of Tobacco Policies on Campus
Allha Akrami & Vishal Patel

Thin for the Win: Effects of Appearance-Related Media on Body Image Perception
Allison Perez

Poster Session I
9:00 a.m. – 9:45 a.m.

Forked Roads: Making A Webcomic
Alyna Santos Bodart

Long-term Neurobehavioral Impact of Prenatal Oxycodone Exposure
Alyssa Green

Long-Term Impacts of Hunting on Frugivore Community Recovery in the Ecuadorian Amazon
Alyssa Michelle Cabrera

Investigating External Factors Influence on STEM Students' Relationship with their Major and Future Profession
Amanda Lindquist

Role of Deliberate Ignorance on Overestimation of Racial Equality
Amara Woodward

Exploring the Therapeutic Potential of Psilocybin: Insights from a Meta-Analytic Review
Amber Fazio

Leveraging ChatGPT to Encourage Shared Decision Making and Trust Between Providers and Elderly Adults in Healthcare Settings
Amrutha Venkat & Rosalie Holderith

Longitudinal Characterization of Resting State fMRI, DTI, and Action-place Spatial Learning in the TgF344-AD rat Reveals Impaired Action-place Learning Emerging at 5-months
Amy Le

Guided Universal Training for Semantic Segmentation (GUTSS)
Amy Wu

Playing Stereoscopic Video Games Enhances the Precision But Not the Accuracy of Depth Perception
Anamaria Rey & Yingzi Luo

Use of qPCR to Detect Genetic Modifications in Various Food Products
Anamichelle Madrid

Sexual Education Experiences among College Students in Florida
Ananda Myers & Joseph Marshall

Preoperative Atrial Fibrillation and Perioperative Outcomes After Robotic-Assisted Pulmonary Segmentectomy
Ananya Siragavarapu

Battleship and the brain I: Pedagogical strategies for directional competence
Andrea Aviles & Isabel Fonseca

Sudden Reductions and Pulsations in Solar Radio Emission: May 11th, 2001, Major Flare
Andrea Torres

Monetary Incentives in Public Health
Andreas Uudmae

Effect of CTSK siRNA-loaded NBs and LIPUS on Osteoporosis
Andres Alayon Mata

Identifying Mechanisms of Capsaicin Treatment in Breast Cancer Cell Lines
Andrew Reidenbaugh

Getting Under Your Skin (and into your Brain): The Problematic Effects of Galactic Cosmic Radiation on Cognition in Long Distance Space Missions
Andy Silva

Evolutionary-Based Identification of Anti-Flavivirus Targets Within Predicted NS5 Structure in Yellow Fever Virus
Angela Dawson

Fatigue Behavior and Microhardness Analysis of Titanium-6Al-4V
Angelena Luciano

Comparative analysis of the Giemsa and Feulgen stain for the micronucleus assay in sandbar shark Carcharhinus plumbeus.
Angelo Cantu

Poster Session I
9:00 a.m. – 9:45 a.m.

Beyond the Classroom: The Power of Discord to Build Community and Enhance Student Learning
Angelys Torres Cancel

Blocking the Oncogenic Wnt Signaling Pathway for Cancer Therapy Using a Novel Small Molecule
Ania Kelegama

E-cadherin expression as a Prognostic Biomarker in Colorectal Cancer
Anika Bhandare

Unsteady Dynamics of Rapidly Pitching and Decelerating Swept Plates
Anirudh Sriram & Matthew Mechlowitz

How Team Roles Impact Stress Through Emotional Regulation and Positive and Negative Emotions in Two-Week Long Space Analog Missions
Anisha Bissessar & Milouni Patel

Corrosion Performance Evaluation of Novel Anodized Aluminum
Ann Jager

Systematic Review of Potential Treatment and Prevention Options for John Cunningham (JC) Virus and Progressive Multifocal Leukoencephalopathy (PML)
Anna Barnes & Zachary Nesta

A Liver-Fat Crosstalk for Iron Flux During Healthy Beiging of Adipose Tissue
Anna Cubito

Preliminary Study of Bidens alba Plant using Thin Layer Chromatography and Antioxidant Essays.
Ann-Adley Claveus

Digital Twin Streetscape Modeling through Integrating LiDAR Vehicle Detection into Simulation Environments
Anton Rajko

Training Coral for the Inevitable
Antonio Tinoco

Impact of Diabetic Retinopathy Severity on the Progression of Primary Open Angle Glaucoma
Anvitha Makkena, Esha Haque, Trisha Pitchala, Megan Watters, Vasco Sanchez Sr., Kayla Cariss, Samika Kalavadia & Shreyas Sathya

What is the Relationship between the Frequency of College Students' Social Media Use and Social Discomfort in Face-to-Face Interaction?
Anwyn R Schiek & Veronica Yanes-Nadal

Harnessing Endophytic Fungi: A Bioassay-Guided Approach to Discover Novel Antifungal Metabolites Against Candida spp
Arshia Esmaeilian

Maternal Investment and Gestational Indicators in in the Atlantic Stingray
Ashlee Locker

Sudoku and Emotional Memory Interference
Ashlee Ross

Identifying extracellular matrices in chondrocyte using click chemistry.
Ashley Flanagan

Investigation on NS5 of the Spondweni Virus as a Therapeutic Target for Broad-Spectrum Antiviral Strategies
Ashley Rosquete

Development of an Organic Chemistry Concept Inventory using Mixed Methods
Ashley Santonil

Mitigation of Harmful Algal Blooms Using Porous Metal Halide Semiconductor (DHT) Bi2I8
Audrey Babcock

Caribbean King Crabs: Coral Reef Restoration and Community Engagement
Audrey Brandt

Post-traumatic Growth Intervention at Valerie's House: A New Horizon for Bereaved Children.
Austin Bradley Wolin, Alexa Gleiber & Ayman Haroon

Poster Session I
9:00 a.m. – 9:45 a.m.

Gendered Depictions of Household Care Responsibilities in Advertisements: A Quantitative Content Analysis
Ava Griner

Masculinity, Protestantism, and Exclusionary Fitness Culture
Avery Solis

Leveraging Machine Learning to Aid in the Utilization of Diagnostic Testing in Thrombotic Thrombocytopenic Purpura
Avery Teman

Characterizing Nos1 Neuron Activity in Non-Homeostatic Feeding Behaviors
Avinash Kanakam

Role of Cadmium Toxicity: A Critical Target in Oxidative Stress
Awab El Ghissassi & Darya Shirzad

Assessing Parental Perceptions of Vulnerability Related to Cancer Treatment Type within Caregivers of Pediatric Cancer Survivors
Ayisha Cardenas

Possible Treatment from the Deep: Effects of Padina gymnospora, Marine Algae, on Breast Cancer Cells.
Aysel Khalil

Master Protocols in Vocal Biomarker Development to Reduce Variability and Advance Clinical Precision: A Narrative Review
Ayush Kalia

BabyMic: A Novel Wireless Device for Non-Invasive Monitoring of Infant Dysphagia
Baylor Reid

'Feathers that Make the Wing' The Compositional Devices of Tchaikovsky's 'Swan Lake'
Bella D. Pantfoeder

Examining Gender Differences in Financial Risk Tolerance and Attitudes Toward Economic Security
Benjamin Friedman

Differences in Prefrontal Cortex Activation During Risk and Ambiguity Aversion
Bhargav Vyas & Milena Alvarado Giler

Impact of Racial Representation in Mental Health Advertisements
Bianca Beliard

Investigating Localized Corrosion-Induced Cracking in Reinforced Concrete Structures
Bibhuti Regmi

Dental Ontogeny and Allometric Scaling as Evidence for Paranthropus Monophyly
Braedon Farkas

Maternal Health in Crisis: Addressing the Impact of Conflict on Pregnancy and Childbirth Outcomes
Brandon Lopez

How Public Figures Play a Controversial Role in Political Campaigns
Brianna Avrilien

Comparative Analysis of Recycled PET and HDPE Filament Production Using Pultrusion for Sustainable 3D Printing
Brinley Jordan

Towards Decolonizing Archival Collections: Promoting Access & Dialogue Through Online Subject Guides
Brittany Renee Marshall Davis

The Impact of Neutrophil Depletion on Aneurysm Healing
Brittney Chang

How Social Interactions vary with Social Status in the Lance-tailed Manakin
Brooke Hagans

Poster Session I
9:00 a.m. – 9:45 a.m.

The impact of Mass Media on the Hyper-Sexualization of Adolescents
Brooklyn Pitre

Complex Emotions in Facial Expressions: Complex Emotional Expression Database Emotionality Ratings and Predictive Models
Bryce Romero & Emily Rancorn

The Innovations of Thermodynamics in Stretchable Materials and Systems
Bryce Sinift & Christopher Oshman PhD, PE

The role of Crocus sativus (Saffron) in reducing migration and Invasion of Breast cancer cells through modulation of MMPs
Burhaan Toor & Andy Holtery

FOS Expression in Respiratory Motor Networks After Cervical Spinal Cord Stimulation and Injury
Caitlin Brennan

Unreal Engine 5 for Synthetic Dataset Creation
Caleb A Fernandes & Justin McMillen

Image Segmentation via Role Extraction with Neighborhood Pattern Similarity Measure
Caleb Stewart

Extracellular Vesicles with Mitochondrial and Viral content induce Myocarditis
Cameron Hartmoyer

Examining wildfire survivorship & post-fire metabolism within forest soil microbiomes
Cameron Johnson

Advancing Socket Design for Customizable Myoelectric Prostheses: Enhancing Comfort and Fit through Innovative Techniques
Cameron Stott

The Relationship Between Religious Importance, Religious Affiliation, and Meaning Presence
Camila Foy

Using Remote Sensing to Identify Seagrass Scars
Caralise Maloy

Algal Innovations: An Integrated Review with Insights into Bioremediation and Bioproducts
Carlos P. Luzuriaga & Kelly Jatib

Generation of Model of Obesity in Zebrafish
Carlos Vazquez

The Perpetuation of Rape Culture in Lisa Wartenberg Vélez's "What is Ours"
Carly Smith

Learning Psychology Through Games
Carlye Waterman, Kaen Freeman, Lori Jacques & Stephen Blessing

Morphometric Analysis of the Human Jaw Through Time and in Relation to Dental Health
Carmela Martinez & Marco Boscolo

Battle of the Sexes: The Impact of Gender on Household Spending and Saving
Carmen Ana Benitez

A Review of Process/Property Relationship for Fused Filament Fabrication Ultem 9085 Resin
Carson Rogers & David Trosclair

The Relationship between AI Usage, such as ChatGPT, for Academic Tasks, and DSC Students' Self-Esteem and Self-Efficacy.
Cassandra Charles & Noah Glenfield

Reptile and Amphibian Populations in Highlands County
Cassidy Albritton

Assessment of Microplastics in the St Johns River in Jacksonville, Florida
Catherine Jeffries & Josephine McKenna

The Negative Impacts of AI in the Animation Industry and its Effect on Future Generations.
Catherine Pacter

ART (Antiretroviral Therapy) Inspires Art: Examining How Visual Art Created by HIV+/ AIDS Patients Helped Decrease the Stigma Around AIDS in Florida
Catherine Smith

Poster Session I
9:00 a.m. – 9:45 a.m.

Cognitive Impairment and Depression in Hispanic and Non-Hispanic Low-Income Older Adults: A Cross-Sectional Study
Cecil Laatta

Visual Scanning Behaviors for Racially Ambiguous Faces are Impacted by Racial Context
Cela Rivera & Emilia Greco

Ultraviolet Exposure Behaviors Among College Students: Examining Risk Awareness, Protection Practices, and Sun Safety Attitudes for Skin Cancer Prevention.
Celia Callahan

The Impact of Cultural Differences on Dynamics of Small Isolated Teams During Global Crisis
Cesar Orue, Andres Kaossar & C. S Burke

Computer-Vision Based Behavioral Coding for Music-Based Interventions: A Pilot Study
Chirantana Dayanandaswamy & Roy Chen

Effect of Donor Blood Stream Infections on Post Liver Transplant Infections and Outcomes
Roy Chen

Poster Session II
11:00 a.m. – 11:45 a.m.

DriveSense: Intelligent Driver Assistance for Enhanced Road Safety
Bongiwe Sandi & Aldridge Kalenga

Safe Space or Save Space: How Genderqueer College Students Navigate the Closure of LGBTQ+ Resource Centers
Charlie Arechederra

Investigating student understanding of Laboratory Errors and Instrument Calibration
Charlotte Disney

Role of Mitochondrial Fission on CVB3 Replication and Myocarditis
Charwan Hamilton

Light Weight Flexible Heat Pipes for Space Applications
Chase Gibson

Employment of AI Recognition Technology in the Emergency Room
Chay Jalloh & Salaheldin Ali

Targeting Inflammation: The Role of JAK Inhibitors in Vitiligo Treatment
Chinaza Munonye

Leveraging Visual Mnemonics in Medical Education: Enhancing Memory Retention through DrawMnemonics.
Chinmay Patil

Impact of the Gut Microbiome on Metabolite Production and Placental Function
Chloe Van Horn

Additive Manufacturing Bio-Inspired Thermosyphons for Thermal Energy Storage
Chris Detky & Ryan Spence

A Meta-Analysis Approach to Examine the Effectiveness of Consumer Graded Warable Device on Physical Activity Level among People with Neurodevelopmental Disability
Christian J Farrell

Exploring Breast Cancer Subtypes, Disparities, and Precision Medicine: Insights from Predictive and Molecular Analyses
Christiana Daria Mihaila & Merna Guirguis

Patterns in Visible and Nonvisible Lattice Points and Polygons
Christina Mark

Mapping Histone H2B-mCherry Genomic Insertion Sites Relative to DNA Replication Chromatin States in Maize
Christine Lezama

Thermal Energy Storage for Stoves
Christopher Relken & Benjamin Tom

Evaluation of the Impact of Nintedanib and Pirfenidone on the Longevity of Patients with Interstitial Lung Disease
Ciara Crocker & Kylie Overstreet

Neural Regeneration in Zebrafish: Investigating Stem Cell Dynamics Following Spinal Cord Injury
Cindia Marra & Brian Avera

Beyond Diagnosis: Tailored Support for Children with Autism and ADHD
Cindy Leon

Hijacking Sci-fi: Alt-Right Intentional Misinterpretation of The Matrix and More
Clair Mallace

The Impact of Language Mixing on Word Class Usage in a Bilingual Person with Aphasia
Clarissa Salas & Kathleen-Linnea Poindexter

Sweetpotato Seed Systems: Advancing National Seed Health in Tanzania through Grower Associations
Claudia-Elena Johnson-Cuellar, Hannah Amaya & Jennifer Laman

4-CzIPN-catalyzed intermolecular [3+2] cycloaddition of cyclopropylamines with indoles in the presence of blue light
Cody Bishir

Pyrene Dicarboxylic Acids: Aggregation and Excimer Formation at Metal Oxide Interfaces
Cody T. Basquill

Poster Session II
11:00 a.m. – 11:45 a.m.

Wastewater Treatment Using Encapsulated Chabazite in Polyvinyl Alcohol-Sodium Alginate Hydrogel Biofilm Carriers
Cooper James

Childhood Home Chaos and Reading Motivation
Cory Balon

Sub-therapeutic Concentrations of Antibiotics Induce Prophage-driven Superinfection Exclusion and Fitness Cost in Pseudomonas aeruginosa.
Cristian Puente

The Relationship between Respect for Authority Figures and Opioid Misuse Among Justice-Involved Adolescents
Dahlia Williams

Cost-Effective Device for Monitoring Postural Control in Lower Extremity Rehabilitation
Damien Krech & Jesse Mitchell

Magnetic Sensor with Enhanced Sensitivity for Biosensing and Healthcare Monitoring
Dan Luu

From Historical Legacies to Long Lasting Peace: Reforms to Combat Inequality in Latin America
Dana Rojas

Utilizing Photorealistic 3D Tiles for Immersive Streetscape Modeling and Urban Planning
Dana Smith

Grandparenthood as a Means of Social Interaction and its Impacts on Subjective and Objective Measures of Cognition: A Mixed Methods approach
Dana Smith

The Application of Low-Cost 3D Scanners for Short-Term Documentation of Fossils, Rocks, and Mineral Specimens in Paleontological Digital Collections
D'Angello Polifroni

Linguistic outcomes of language contact between Quechua and Spanish in Argentina
Daniel Abrill & Sandra O'Connell

Student Reflections on Their Use of Electronic Shared Notebooks in a Large Enrollment General Chemistry Course
Daniel Sebastien

Onset of negative magnetic heat capacity due to spin-vibrational coupling in quantum spin clusters
Daniela Zavala

Rolling the Dice: The Cultural Impact of Mass Media on Sports Betting
Darryl Williams

Reviving The Arcade Culture
David Andino & Jason Markins

Artistic Representation: Dialogue of Themed Design for Prosthetics
David Cardona

Examining Hope as a moderator between Racial Microaggressions and Anxiety in Black Students attending Predominantly White Institutions
David Frazier

Exploring the Mechanical and Structural Properties of Bombyx mori Hydrogels Formed by Electrogelation
David Phuong Tran

Explore or Exploit? The Impact of Different Coordination Structures on Team Performance.
David Switzer & Brooklyn Olesen

Effects of Process Parameters and Annealing on Mechanical Properties of Fused Filament Fabrication Ultem 9085
David Trosclair & Carson Rogers

Using Bioinformatics to Explore NS5 Pockets in West Nile Virus for Future Flavivirus Antivirla Drug Development
Dayanara Leyva

Poster Session II
11:00 a.m. – 11:45 a.m.

Describing E-Health Literacy and Technology Use Habits Among Low-Income Community-Dwelling Older Adults
Dea Chovatia

Analyzing Rates of Suicidality and Substance Use Disorder in Justice Involved Adolescents with ADHD
Deborah Remarais

The Effects of Positive Versus Negative Framing on Risk-Taking Behavior in Decision-Based Tasks
Deepthi Prince

Identifying risk factors in adolescence that contribute to metabolic syndrome in Asian Americans using the National Longitudinal Study of Adolescent to Adult Health
Deidra Newvville & Dev Patel

Assessing the Effect of Elevation Above Substrate on Coral Outplant Growth
Delaney Deinlein

Evaluation of usability and perceptions for a temporalis muscle based EMG wheelchair controller
Delaney Gunnell

Testing the effects of salinity and stress conditions on durum wheat for salt- related genes in DNA and differentially expressing to RNA
Demar Williams

Reel Impact: How Bigotry and Racism Affects the Film Industry
Derrick Taylor

Examining Students' Responses to Biochemistry Creative Exercises
Dev Chary

Pilot Study-Relationship identification between triggers and electrophysiological changes in the brain and the overall human electrophysiology during migraines
Dominic Sandell & Zachary Readdick

Integration of Semiconductor Nanomembranes into Ortho-K Contact Lenses
Dontavious Ellis

Can Invariant Risk Minimization (IRM) overcome shortcut learning?
Duong Xuan Tung Mai

AI-Enhanced Maternal Care: Predictive Models for Maternal Health Risk Factors
Dylan Huston & Roy Chen

Large Language Modeling predictions of Missense Variant Effect via 3D Protein Structure
Dylan J. Tan

The Relationship of Taste Reactivity Behaviors and Fos-Immunoreactive Neurons in the Gustatory Cortex Elicited by Intra-Oral Infusion of Mixtures of Sweet and Bitter Tastes
Elayna Rauscher

Prevention Is Power: The Misinformation Of HIV/AIDS in the Media
Elfridge Arthur

Trade Wars and Domestic Gains? An Analytical Model of U.S. Tariff Policies
Elias Rodriguez

Unraveling the Microbial Diversity of Freshwater Ecosystems Under Environmental Pollution
Elik Esquilin

Analysis of Forensic Science Student Anxiety Levels When Exposed to Forensics Visual Stimuli Tasks via the Evaluation of Galvantic Skin Response.
Elisa Guerrero

Analysing the Rate of Femicide of Indigenous Women in Rural Australia
Eliza Finnigan

Poster Session II
11:00 a.m. – 11:45 a.m.

The Effects of Climate Change on the Geotactic Swimming Response of Larval Stone Crabs
Eliza Patty

How Does the Shape of Sexually Selected Weapons Vary with Body Size in the Insect, Narnia femorata?
Elizabeth Bane

Understanding Museum Educators' Sense of Community in the Workplace
Elizabeth Riotto

Clue'd in II: Time Competency Perceptions using Clinically-Based Board Games
Ella Porter, Trinity Knight & Rebecca Harper

Creatine Monohydrate Supplementation Increases Skeletal Muscle Microvascular Blood Flow
Ella Vizzini

The mouse olfactory bulb receives input from hypothalamic neurons expressing orexin-A and melanin-concentrating hormones.
Ellee Harden

Analysis of Conserved Domains in Promoters of Differentially Expressed Genes
Emalynn Tobias

Orienting GTAs to Stretch-It Questioning using Simulator Training: How can This be Applied?
Emanuella Rose Dolcine

Perceptions of Illicit Drug Use and Perceived Drug Misuse Risks Among Individuals with Military Experience
Emilia Havlicek

We Don't Talk About Bruen: The Future of Second Amendment Jurisprudence
Emilia Shepard

Evaluating Exercise Biomechanics Data Collection Methods for Deep Space Missions Using Inertial Moment Units (IMUs)
Emiliana Del Rosario & Emma Drew

Spatial Navigation Skills In Schizophrenia – A Meta-Analysis.
Emilie Vedder

The Relationship Between Daytona State College Student's GPA and Self-Esteem
Emily Borbidge & Jacquilyn Hudson

Nontargeted Analysis of Per- and Polyfluoroalkyl Substances by Online Liquid Chromatography 21 Tesla FT-ICR Mass Spectrometry
Emily Hughes

Cloud Condensation Nuclei Activity of Fresh and Oxidized Syringic Acid Aerosol Particles
Emily Nortmann

Democracy's Glass Ceiling: Female Candidates & Voter Support for Antidemocratic Behavior
Emma Barrett

Longitudinal Effects of Low-Level Developmental Ethylbenzene Exposure on Zebrafish Survival and Reproduction
Emma Cavaneau

Examining the Effects of Water and Sea Level Rise on Archaeological Gar Scales Through the Application of Diverse pH Solutions
Emma Ditzig & Destiny Perez

The Path to Authentic Relationships: Understanding the Impact of Adverse Childhood Experiences and Emotion Regulation
Emma Heidelberg

Bounded Transient Time Leader Emissions tracking
Emma Lambert & Ainsley Helgerson

Characterization of New Molecular Tools to Detect Branched Ubiquitin Chains
Emma Werner, Isabella Holt, Hannah Maloney & Michael E. French

Indicator's of Partisanship in the United States
Eric A. Bonilla & Dr. Ransford Edwards

Poster Session II
11:00 a.m. – 11:45 a.m.

Bullying Victimization in College: Review of Associations with Psychological and Academic Outcomes
Eric Clayton

Does Receiving a Personalized Noncognitive Skills Profile Influence First-Generation Students' Achievement Compared to First-Generation Students Without a Received Profile?
Erika Shayne P. Tarongoy

Understanding Barriers to Sustainable Behaviors: A Mixed-Methods Study at Brevard Zoo
Erin Stolen

Investigating the Dimerization DNAJB1 Protein
Erina Kotreli & Trang Le

ASCL: The American Sign Computer Language Recognizer for Understanding ASL
Ertis Seferi

Discovering SoulClap: An Intergenerational Auto-Ethnographic Discussion on Black Joy, Health, and Wellness
Eryn Files & Gemini Williamson

Eye on the Target: Robotic Emulation of Mammalian Gaze Fixation Using Computer Vision
Essence Wallace

Evaluate Foundation Model Performance for Dental Radiograph Segmentation
Eswanth Sriram Chengalasetty & Laura Brattain

"Help me, help you, help me" Work From Home: Graduating Seniors' Attitudes on the Pros and Cons of Working Remotely Following Graduation
Eternity Bradshaw

Genomic Epidemiology of Staphylococcus aureus Sequence-type 97
Eva Armao & Sachitaa Senthilkumar

Convenience Robotic Arm for Power Wheelchair Users
Faith El massari & Daniela Zamora Alviarez

The Effects of Music and Visual Arts Training on Response Inhibition in Children (8-12 years)
Faith N. Nwosu & Medha M. Patel

Characterizing the sleep-wake-related dynamics of protein kinase A
Fapianey Alexandre

A Systematic Review of Rapid Urbanization and Coronary Artery Disease in Sub-Saharan Africa.
Faris Hassan & Ethan Joseph

Evaluation of Multiple Choice Questions from Publishers used in Introduction to Forensic Science using Item Writing Flaws Evaluation Instrument
Fatima Khogali

Exploring Hearing Health Beliefs in Hispanic/Latine Populations Suing the Hearing Beliefs Questionnaire
Fiorella Wu

Characterizing Biofilm Formation Potential of Klebsiella pneumoniae MRSN Isolate Strain 564304
Flor Santiago

The First Three Decades of GIS Development
Flora Domitrovic

Optimizing End-Capping Strategies for Enhanced Self-Healing in PDMS Polymers
Forrest Dohner

Detecting Hardware Trojans Using Side-Channel Power Analysis
Franco Mezzarapa & Joshua Joseph

Compound Cavity Formation and Splash Crown Suppression by Water Entry Through Proximally Adjacent Polystyrene Beads
Freddy Zeas & Sebastian Anzola

Poster Session II
11:00 a.m. – 11:45 a.m.

Identification of Key Cytosolic Molecular Chaperones in Tardigrades
Gabriela Serra

Parental Involvement in the development of Social Anxiety Disorder in Children and Adolescents
Gabriella Boykin

Pilot Study: Undergraduate Student Perceptions of Research Groups as a Community of Practice
Gabriella Khazal

Adaptation of an Invasive Tree Frog (Ostepilus septentrionalis) in Response to Hurricane Milton
Gabriella Moraglia

Using Item Writing Flaws Evaluation Instrument to Assess Instructor's Multiple Choice Questions in Introduction to Forensics Undergraduate Classes
Gabrielle Rios

Investigating Effects of Air Pollution on Plant Development Using the Artificial Production of Acid Rain
Gailen Carrasco

Anhedonia, Worry, and Theta Power: Concurrently High and Low Levels of Anhedonia and Worry Attenuate Reward Prediction Error Signaling
Gavin Heindorf

The Vaping Project: Vaping Effects on DNA
Genesis Vega

Evolution of Magnetic Ordering in Kagomé-Lattice Intermetallics, LnT6Ge6 (Ln = Gd, Tb; T = Mn, Fe, Co)
Gerald Ciani

Introductory Guide on Coral Bleaching
Gianluca Talarico

Effect of Task Type and Language of Task Elicitation on Pathological Language Mixing in Bilingual Aphasia
Gianna Mineo & Kathleen-Linnea Poindexter

Males of a fighting insect differ in whether their sexually selected hind leg spines bend or break
Giovanna Avellar Figueredo

Studying Aggression & Theory of Mind Through a Cooperative LEGO Building Task
Grace Flatscher & Jenna Redmond

Aging Popular Exoplanet Host Stars; A Bayesian Analysis of Stellar Evolution
Grace Henry

Exit Flow Characteristics in Planar Symmetric and Asymmetric Nozzles at Different Nozzle Pressure Ratios
Grayson Hayes & Donald Tuten

Impact of Subclinical Hypothyroidism on Cardiovascular Health and Quality of Life
Hadi Quefatieh, Trisha Pitchala, Dea Fejzo, Nikhil Chainani, Edison Johnson, Jalal Jamil, John Lingam & Zein Hamdan

Impacts of Sediment Grain Size on Seasonal Dune Restoration
Hailee Belcher

Do different brands of environmentally friendly paints affect forensic paint analysis?
Hailee Leach

Marlise Muñoz: Trapped on Life Support
Hailey Citrenbaum

Outcomes and Resource Utilization of Normothermic Machine Perfusion and Cold Storage in Liver Transplantation
Hailey Mangio & Giovanna Pires Casarejos Pecin

UV-Altered Macrophages: Impact of UV Radiation on Phagocytic Receptor Expression in M2 Macrophages and Implications for Tissue Repair and Immunosuppression
Hala Hafez

The Role of Threat Responses in PTSD Severity Among Youth Polyvictims: Exploring Fight, Flight, and Freeze Responses as Moderators
Halli Van Den Heuvel

Poster Session II
11:00 a.m. – 11:45 a.m.

Investigation on Singaporean Information Literacy Practices
Han Le

Understanding Cultural Genocide in Current Political Contexts: Three Errors in Scholarship
Hanna Kobs

Enteral Nutrition Intolerance among pALS: a Retrospective Chart Review
Hannah Baumer

Fanfiction as a Reflection of Available Representation: A Critique on Mass Media
Hannah Benton

Beard Length and the Efficacy of an Aviator Oxygen Mask
Hannah Lyons, Courtney Louderback & Allysa Hayden

The Relationship Between the Time Spent on TikTok and Instagram and College Students' Self-Perception of their Social Media Addiction
Hannah Zuniga, David Jimenez, Tobias Garland, Lily Achins, Evan Casterline & Eliana Sharper

Analysis of Neogloboquadrina pachyderma (N. pachyderma) and Neogloboquadrina incompta (N. incompta) in the North Atlantic (N. Atlantic) as a Proxy for Ocean Temperatures from ~280-11,600 yrs ago
Hannah-Louise Burd & Mackenzie Taylor Cole

Investigation of Health Literacy as a Critical Determinant of Asian American Immigrant Health
Harrison Tsai & Ngan Mai

Exploring Treatments for Depressive Symptoms in Patients with Parkinson's Disease
Roy Chen & Madison Bonaventura

Viola-Jones Algorithm Integration for Face Detection and Recognition in Autonomous Vehicles
Buchizya Mwase & Bongiwe Sandi

Identification of Regulatory Roles for Stress Responsive Transposable Elements in Rice
Emalynn Tobias

Ecomorphological Variation Across Urban vs Rural Populations of Invasive Cuban Treefrog (Osteopilus septentrionalis)
Abigail Kirkpatrick

Poster Session III
1:15 p.m. – 2:00 p.m.

Preference of a Weevil Pest, Listronotus Sparsus, for Six Apiaceous Crops Grown in Florida
Hayden Mickley

Purposeful Play in Action: Extending Museum Engagement to the Home
Heather A. Berwanger & Allison R. Wieland

Pododermatitis (Bumblefoot) in Seabirds: Treatment and Prevention at Pelican Harbor Seabird Station
Heather Rose Hernandez

AI Chatbots affect on Social Connections
Hedda Forsman & Hyann Jimenez Ruiz

Bridging the Gap Between Brain Activity and Prosthetics with AI and Neuroimaging
Henrique Oliveira Gamonal de Castro & Anthony Valverde Kong`

Are Black Holes Actually at Their Maximum Spins?
Holly Zeyl

Comparative Analysis of Vascular-Organs-on-Chip Technology to Standard Treatments of Vascular Conditions
Ian Broadman & Kristy Tran

Nuclear Membrane Rupture as a Cell Killing Mechanism for Paclitaxel and Carboplatin in Lung Cancer Cells
Ibrahim Nasim

Socioeconomic Drivers of Crime in France: Analyzing the Relationship Between Immigration, Poverty, and Criminality
Imadeddine Zmarou

Potential Causes for the Early Onset of Colorectal Cancer (EOCRC)
Irfan Mahadi Sharif & Stuti Dibbur

Baroque Influence in the Structure of the Venezuelan Piece 'Suite Para Cuerdas: Fuga Con Pajarillo'
Irsia Ruíz Guzmán

Feeding biomechanics and native and invasive fish species in the Florida Everglades
Isabel K. Knuteson & Grace Magnacca

Shifting Influences: Social Media and Substance Use Perceptions Among College Students
Isabel Santos de Oliveira

Expanding the Application Space within Polyverif and Integrating Neuroevolution
Isabella Acosta & Hannah Ramsden

Security Public Schools: A Comprehensive Review of Scalable School Safety Strategies Through Statistical Analysis of Security Mechanisms
Isabella Ensign

The Influence of Pre-Pregnancy Obesity on Dietary Consumption of Sugar-Sweetened Beverages and Processed Meats on Infant Birth Weight
Isabella Guenzler & Zara Haruna

The Role of Bimanual Coordination in Music Learning
Isabella Ramsaroep

Stress Relaxation Dynamics and Rheological Behavior of Silk Fibroin Hydrogels
Isabelle Gerzenshtein

Two-way communication system - AMERICAN SIGN LANGUAGE to ENGLISH using AR Glasses
Jack Leser & Trevor Chessnoe

Literary Visions of Postmodernity in the Post-Colonial in Jünger and Guyotat
Jackson Griffis

Navigating Justice: Gender Perspectives on AI's Role in Court
Jacobo Fabregas Navas

Surveying the Scroll: A Mixed-Methods Study of College Students' TikTok Privacy Literacy
Jad Dargam

Poster Session III
1:15 p.m. – 2:00 p.m.

Understanding Honors Students' Perspectives on ChatGPT in their Academic Activities
Jada Lessen

Investigation on MicroRNAs for Canine Congestive Heart Failure
Jada Prignano

Exploring Anxiety and Academic Motivation In Students Enrolled In Chemistry Courses
Jaden Salameh

Effects of Finasteride on Cell Regeneration Using Planaria as a Model System
Jahann M Hannor

Modeling Stellar Isochrones during the Evolution of Young Star Clusters
James Egdorf

Slaves, Hillbillies, and Fine Young Ladies: The Banjo's Transition into and out of Mainstream Society
Jane Cohen

PhotoVOICE: Revealing and Amplifying Faculty and Student Voices for Equity in STEM
Janet Provitera & Erika Tarongoy

The Arm-Leg Interactive Coupling Exosuit (ALICE): A Medical Device Transforming Gait Rehabilitation
Jannah Barakat & Giovanni Padron-Calero

Afrocentric Empowerment & Storytelling in Hip Hop: Amplifying Marginalized Voices in Little Simz's Album No Thank You
Jaquoi Dorsett & Dr. Armin Langer

Exploring Silicon as a Viable Alternative to Carbon in the Formation of Extraterrestrial Life
Jasmine Francois

Empowering Marginalized Youth Through Sports: Developing Marketing and Brand Strategies for Community-Based Athletic Programs and Media Engagement
Jasmine Grant Sutton

Water Quality and Anatomy of Selected Plant Species Growing at Tomoka State Park and Riverbend Nature Park, Volusia County
JDeja Evans & Mackenzi Thompson

Correlating Trait Disinhibition and Stimulus-Locked Event-Related Potentials in the Go/no-go Context
Jeffrey "Zach" Helms

The Role of MEK Signaling in Drosophila Melanogaster Dorsal Patterning
Jeiselli Archer & Abraham Hernandez

Studying Desire for Control & Theory of Mind Through a Cooperative LEGO Building Task
Jenna Redmond & Grace Flatscher

Potential Druggable Pockets from NS2A in Zika Virus for Antiviral Development
Jennifer Samantha Santana

Angiopoietin-like 4 as a potential therapeutic target for clear cell renal carcinoma
Jeremy Kleberg

Dynamic Nearest Neighbor Search: A Comparative Study and Visualization Framework
Jessica Lourenco & Zhengxiao Wang

Fundus Reflex Assessment for Healthcare Providers Not in Ophthalmology: A Simulation-Based Training
Jessica Olivera

Can an Invasive Species Change Native Behavior? An Investigation into Cannibalism Among Mangrove Crabs Associated with the Invasive Brazilian Peppertree.
Jessie Wahlers

Transcriptional Differences in Intrinsically Disordered Proteins Associated with Obesity in Danio Rerio
Jillian Arzoumanian

Behavioral Validation of Salicylate-Induced Hyperacusis in CBA/CaJ Mice Using an Active Avoidance Paradigm
JM Warith Rahman

Poster Session III
1:15 p.m. – 2:00 p.m.

Is that Supposed to be an Ant: An Undergraduate DNA Barcoding Experience
Joan Go, Samantha Cruz, Kalel Garcia-Herreros, Kylie Labra & Jesus Ruiz-Cantellano

Hormonal Contraceptive Status and Women's Relationship Dynamics: A Study of Satisfaction, Commitment, Investment, and Interest in Alternatives
Joanna Gerges

Analysis of Antibiosis in Capsicum Annuum Varieties Against Thrips parvispinus
Jon Declan Sullivan

Anthropogenic Impacts on Stone Crab Physiology: Temperature Tolerance in Menippe Mercenaria
Jonathan Ballard

Enhancing Streetscape Digital Twin Modelings through Automated 3D Building Model Refinement
Jonathan Lalla & Jinwoo Jang

Water Quality Analysis In the St. Johns River
Jonathan Venable

Exploring Sex Differences: A Cross-Sectional Analysis of Risk Factors and Substance Use Disorder in Sexually Abused Justice-Involved Adolescents
Jordan Barringer

Temporal and Spatial Differences in Mercury Exposure in Sandbar Sharks (Carcharhinus Plumbeus) from the U.S. East Coast
Jordyn Bharratsingh & Dakota Jacks

Impact of Cryptococcus Neoformans Capsular Polysaccharide Release on Microglial Purinergic Receptor Expression and Chemotaxis
Jose David Valles

Automated Protein Function Prediction using a Novel Structural Feature Set
Joseph Cagle & Omar Elfayoumy

Assessment of Federal Reserve's Expansionary Policies Impact on the Housing Market
Joseph Duran, Alex Tapia & Alex De La Portilla

Microhabitat Manipulation at Display Sites by Male Lance-Tailed Manakins (Chiroxiphia lanceolata).
Josephine Whelan

The Role of Aberrant Tyrosinase in Vitiligo in Pediatric versus Geriatric patients?
Joshua Diaz

Multi-Shock Instability Effects on a Dense Distribution of Particles in a One-Dimensional Regime
Joshua Gillis

The Impact of Fentanyl and Xylazine on Respiratory Control Mechanisms
Joy Yang & Ananya Prakhya

Assessing the Impact of North Carolina Teen Court on Recidivism
Joziah Burnett & Varun Raju

STAT3: A Potential Therapeutic Target for Plaque Psoriasis
Judah Olugbemi

Bouncing Back: Investigating the Interplay of Team Resilience, Positive Affect, and Performance
Julia Devoe & Dana Smith

Chemotherapy vs Microrna Therapy in Non-Small Cell Lung Cancer
Julian David Guinand Rincon

3D Bioprinting of Soft Magnetic Bacterial Flagella-Inspired Microswimmers
Juliana Castelli

The Intersection of PANoptosis and Lung Cancer: A Literature Review
Julio Cesar Blanco III & Saiba Khan

GDNF-Based Neuroprotection in Parkinson's Disease: The Role of Advanced Nanotechnological Delivery Systems
Jumana M. Ahmed

Poster Session III
1:15 p.m. – 2:00 p.m.

Cognitive and Psychosocial Effects of Piano Training in Patients with Cancer Diagnosis
Kadence Relente, Lucas Lee & Pranav Kanthala

Identification of Neuronal Populations in the Anterior Cingulate Cortex Active During Chronic Pain
Kaleigh Harbin

Multidimensional Connectedness as a Facilitator to Attaining Wellbeing among Men and Boys
Kamalie Thomas & Khushi Chauhan

Investigation of the Potential for Neural Inflammation Induced by Continuous and Repeated Peripheral Nerve Stimulation Using Ultrahigh Field MRI (21.1 Tesla) and a Rat Model
Kara Lane-Lightfoot & Alexander Campbell

Assessment of Neurodegeneration in the Cerebellum of Slc39a14-Knockout Mice
Karam Abilmouna

A Systematic Review of the Efficacy of Tumor-Infiltrating Lymphocytes (TIL), an Adoptive Cell Therapy, in Improving Overall Survival and Response Rates in Patients With Advanced Melanoma
Kareem Suleiman & Faris Hassan

Evaluating the Effects of Bidens Alba Plant Extracts for Anticancer Activity
Karla Perez Vazquez

The Truth and their Versions: Florida Lawmakers and Academic Freedom Across K-12 and Higher Education
Kassandra Faylun

Association between Oral Health and Metabolic Syndrome in Cancer Survivors from UK Biobank
Katelyn Disler

Exploring the Emotional Intelligence of Domesticated Companion Animals: Implications for Support and Empathy
Kayla Domres

Using Immunohistochemistry to Gauge the Role of Cholesterol Dysregulation in Alzheimer's Disease
Kayla Win

Molecular Insights into Sex Differences in Distinct Taste Cell Types
Kaylee Perez

A Systematic Review of Memphis Acidalia
Kaylie Johnson

Moscow in the Harlem Renaissance
Kaysyn Jones

Fake or Real? Unmasking the Role of Personality, Cognitive Reflection, and Modulating Factors in News Perception
Kazi Salsabil & Dr. Nichole Lighthall

UNet-Flood Mapping
Keanna Forbes & Aldridge Kalenga

Feasibility of Atmospheric Brakes on Mars Ascent Vehicle for Nominal Orbital Insertion
Keanu Brayman

Transformation and Polymerization of 0D "Buckyballs" Buckminsterfullerenes into 2D Polyfullerenes and Graphullerenes
Keegan Phayden Suero

Patterns and Determinants of Post-Diagnosis Cardiovascular Disease in Hispanic Breast Cancer Survivors
Keidy Bello

Brain-wide Mapping of Adaptive Feeding States in Astyanax Mexicanus
Keisha Bansal

Using ChatGPT to Improve Readability of Spasmodic Dysphonia Patient Education Websites
Kelly Clevenger

The Role of the Proteasome in the Plasmodium Falciparum Life Cycle
Kelvin Asare

Poster Session III
1:15 p.m. – 2:00 p.m.

Inflammatory Transcriptional Signature Can Discriminate De Novo and Secondary AML
Ken Dao

Human Hepatocyte Expansion in Microfiber Scaffolds for 3D Bioprinting Applications
Kennedie Cearlock

Cookie Cutter Girls: A Content Analytic Investigation of the "Clean Girl Aesthetic" on TikTok
Kenson Moore

Chromatography Analysis and Preliminary Phytochemical Screening in Medicinal Plant Extracts
Kenya Arozarena

Predator and Prey: Genomic resources for the Pink Sundew and its Herbivore the Sundew Plume Moth.
Kerissa Tarpley

Biophysical characterization of neurons in the subthalamic trajectories of Parkinson patients during DBS surgery
Khanh Linh Hoang

Outcomes in Liver Transplant Patients with Gastroparesis: A Retrospective Cohort Study
Kiera Johnson & Siyona Praveen

Comparison of Visual Outcomes Between ICG and BBG Dyes Used in Macular Hole Surgery
Krish Ghosalkar

The Mitochondrion-mediated Apoptosis in Thyroid Cancer Cell (MDA-T41): The Role of the Melatonin
Ksenia Lynn Greene & Colten Denby

Beneath the Bloom: The Emotional Impact of Early Breast Development and Polycystic Ovary Syndrome (PCOS) on Young Women's Self-Image
Kyla M. Smith

Pulmonary Complications of CAR-T therapy, the Mayo Clinic experience
Kylie Overstreet & Ciara Crocker

Awareness of Your Dating Status Enhances Memory of Relatively Attractive Faces
Kylie Rubino & Vivek Kiluk

Adverse Childhood Experiences and Working Memory
Lake Miller

Mathematical Models of Projectile Motion
Landon Tillman & Claire Hart

The Legal, Ethical, Economic, and Financial Impacts on Community Redevelopment Agencies (CRAs) in Florida since the Passage of Florida House Bill 9 in 2019
Laurel Richmond

YBX1 Functions in the Drosophila Fat Body to Regulate Sleep
Lauren Campbell

Cryptic Diversity of Ligia novizealandiae Isopods from Te Ika-a-Māui / North Island of Aotearoa New Zealand
Lauren Gardner

Investigating the Interaction of Class B JDPs with Hsp70
Lauren Gledhill

Mitigating Heat Strain in Construction Workers Through Artificial Neural Networks
Lauren Nunag & Joseph Spagnoli

TikTok and Distractibility
Leah Jensen & Victoria Mena

Re-Imported Sexuality: Orientalism, Heterotopia, and Prostitution in Nineteenth Century French Art
Leah Lentz

A New Normal? Synthesizing the Documented Impact of the COVID-19 Pandemic on Latina Breast Cancer Survivorship
Leah Scott & Sofia Cuello

Examining Fatalism in Hispanic/Latina Breast Cancer Survivors
Liara Lopez Torralba

Poster Session III
1:15 p.m. – 2:00 p.m.

Tissue Specific Compensatory Regulation of Gene Expression Associated with Copy Number Variants in Danio Rerio
Lillian Cavanagh

The Effects of Guardian Death on Development of Personality Disorders.
Lillian Paulitz

From Tools to Teammates: Developing a Trust Framework for Human-AI Collaboration
Lily Hayes & Taina Pimental

Developing a DNA-based Molecular Calculator
Lindsay Trent

The Role of YTHDF1 in Regulating Neuroinflammation Induced by Lipopolysaccharide
Linh Nguyen

Cuba's Cultural Mosaic: The Impact of Old and New World Influences on Religion and Society
Lisbet Vidal

Shoot First, Ask Later": The Relevance of the Military Police in the Culture of Fear and Violence in Favelas of Rio de Janeiro.
Livia Guimaraes de Oliveira

Personality Traits, Financial Strain, and Stress: Insights into College Student Well-Being
Livia Hertel

What do Americans think about the death penalty?
Livia Vieira

Documenting Vocal Responses to Adult Song in Wild-Caught Sparrows
Liz Linares

No Association Between Changes in Leg Lean Mass and Muscle Strength Following Short-Term Resistance Training Among Older Adults: Preliminary Findings
Logan A. Banks & Vanessa C. Cabrera

Distribution of Psorospermium Haeckeli in South West Florida
Logan Chandler

The Cognitive Abilities of College Students and their Relationship to a Personal Sense of Uniqueness
Logan Denney

Wireless Data Transmission for Children with Mobility Impairments: Enhancing Rehabilitation Monitoring
Logan Licini & Da'Qwan Fredericks

Hooked on Sweetness: Testing Light Attraction in Planaria with Alternative Sweeteners
Logan-Marie Torry

Investigation into the correlation between Signal Transducer and Activator of Transcription 3 (STAT3) Pathways and the Development of Glaucoma
Lori Nguyen, Ada Lau, Kadence Relente & Steven Nguyen

EsperSense: A Monitoring Device for Trimethylaminuria (TMAU)
Lucas Bonassi & Megan Perusse

Behind the Screen: How Personalized Ads Shape Your Social Media Experience
Luisa Lucigniani

After the Storm: Protecting the Integrity of Clinical Research Data Against Future Natural Disasters
Luis-Francisco Guevara & Bryan Robleto

Effects of Two Substrates on the Growth and Development of an Endangered Cactus
Luke McCall & Thomas Laura

Utilizing Engineered Base Editors to Target Therapeutically Relevant Sites
Madeline Sheppard

Belonging and Engagement in the College Classroom: The Role of Course Modality
Madison Choice

Poster Session III
1:15 p.m. – 2:00 p.m.

Regenerative Potential of Cannabidiol in Chemically Ablated Olfactory Epithelium
Madison Klick

Examining Organizational Capacity Pre/Post Implementation of Evidence-Based Interventions to Increase Adolescent Human Papillomavirus (HPV) Vaccination: Preliminary Results from the HPV MISTICS Trial
Madison Matos

Mathematical Problem Solving for Students with Disabilities
Madison Zelner

Making Predictions of Bacterial Population Dynamics Using a Metropolis-Hastings Algorithm
Mahathi Tallapragada

Development of Value Sets to Study Immune-Related Adverse Events in Cancer Therapy
Prerana Patibandla & Roy Chen

Development of Impedance Biosensor with an Increased Chemically Reactive Surface Area using Gold Nanoparticle-Coated Cellulose Nanofibers
Rahela Dolha

Genetic Factors Controlling Pathologies Across the ALS-FTD Spectrum of Disorders
Roy Chen & Ramzia Sorathia

Poster Session IV
2:15 p.m. – 3:00 p.m.

Balancing Nature's Rights and Human Needs: Evaluating Ecuador's PachaMama Law and Its Potential Application in U.S. Conservation
Rylie Brooker

Oral Microbiome Dysbiosis as a Mechanistic and Socio-Cultural Driver of Metabolic Dysfunction
Sammi Rather

Domain Knowledge Synthesis for AI-based Predictive Modeling in Rice Cultivation
Emalynn Tobias

Investigating the Effect of Vitamin D on Host-Pathogen Co-Evolution
Jessica Olivera

The Relationship Between Cadmium Exposure and Cancer Due to Epitranscriptomic Mechanisms
Karla Evangelista De La Rosa & Joshua Diaz

Physiological Effects of Autistic Masking in High Functioning Adults
Lillian Paulitz & Megan Kaiser

Enhancing Voter Equity in Volusia County through Vote by Mail Enrollment and Reenrollment Research and Initiatives
Mahogony Jules

Hearing the Unheard: Understanding the Lived Religious Experiences of Queer LDS Women in Utah
Maiya Johnson

Uncovering the Pharmacogenetics of Ticagrelor, a Potent Inhibitor of Platelet Aggregation
Makenna Myrick

Cognitive and Physiological Moderators of Anxiety's Impact on Adaptive Functioning in Young Adults
Makenzie Kennedy

The Estrous Cycle Phase Influences Exercise Capacity Without Altering Dehydration in Mice During an Exertional Heat Stroke Protocol
Malaica Ashley

Morphometric Analysis of the Human Jaw Through Time
Marco Boscolo & Carmela Martinez

Hostile or Non-Hostile: The Impact of Attributional Ambiguity on African Americans' Spontaneous Impressions and Mental Health
Margherita Pallanti

Navigating Truth and Deception: Detectable vs. Deniable Lies in Individual Decision-Making
Maria A. Fernandez

Evaluation of Anchoring Effects on Political Survey Assessments
Maria Gonzalez

Perceived Political Misalignment and Group Conformity: The Role of Intragroup Threat on Polarized Political Beliefs
Maria Gullesserian

Biocompatibility of new polyurethane-based polymeric materials for sports mouthguard fabrication
Maria Melara

Effects of Running on Mental Health (Anxiety and Depression)
Maria Parra Gil

Membrane Palmitoylated Protein 2 (MPP2) as a Target for Improving Memory in Young Adult and Aged Mice
Mariam Uddin

Complications and Resource Utilization Following Liver Transplantation from Donors after Circulatory Death
Mariana Silveira Vilani & Thrisha Acharya

Poster Session IV
2:15 p.m. – 3:00 p.m.

The Legal Challenges of Ibogaine-Based Psychedelic Treatments for U.S. Military Veterans
Marianne Ruschman

Environmental Assessment of Nitrate Pollution in Wagner Creek and Little River Canal, Miami, FL
Marielca Mondesir

The Cost of Being Female: A Survey on the Pink Tax
Marjon Borjian

Endo-fights: A Study of Antifungal Secondary Metabolites from Endophytic Fungus
Mars English

The Influence of GENDER and CULTURAL BACKGROUND on COPING MECHANISMS within SPACE ANALOG ENVIRONMENTS
Mary Marcella & Claudia Allocca

SCUBA Science: Method Comparison of ROVING DIVES and STRIP TRANSECTS in Sub-tidal Sea Star Population Surveys
Mary Schneider

Accelerating Real-Time Inference with FPGA-Implemented Logic Gate Neural Networks
Matheus Kunzler Maldaner & Raul Valle

Parents Use Restrictive Mediation to Prevent Cyberbullying Across Grade Levels
Matthew McGovern

Bacteria-Mediated Regulation of Host Stress Responses
Matthew Tibi

Study Design for Stroke Prevention in Young Adults within Underserved Communities
Mauricio Gallardo-Fuentes & Jadyn Arter

The Impact of Space Debris on Launches
Max A. Blumenfeld

Optimizing CRISPRi Gene Silencing of Putative Drug Targets in Mycobacterium Abscessus
Max Ivanov

Efficacy and Safety of PCSK9 Inhibitors in Pediatric Heterozygous Familial Hypercholesterolemia
Mebaliah Luchini de Almeida Torres

Differences in Health-Related Quality of Life Among Breast Cancer Survivors by Hispanic Origin in a Cross-Sectional Study
Meera Lakshmanan

Mangrove Menagerie: The Future Pharma-Sea
Megan Dillman

Impacts of Digital Technology on the Preservation and Transmission of Heritage and History
Megan Meese

Nourishing Smiles: The Vital Link Between NUTRITION and ORAL HEALTH
Mena Armosh

Hypertension Management in Menopausal Women through Physical Activity
Meriam Naguib

The Outcomes of Implementing CARS-2 for Faster ASD Diagnosis and Access to ABA Therapy on Different Insurances
Meybelyn C. Bauza

Macrophages and Cancer: Exploring DNMT3A Mutation in Bone Marrow-Derived Macrophages
Mia Morin

Ultra-high Molecular Weight Polymer Synthesis via Aqueous Dispersion Polymerization
Micayla Vereb

AI-Driven Post-Silicon Root Cause Analysis for Hardware Defects
Michael Castiglia

Graft Copolymerization of Methyl Methacrylate on Corn Pulp
Michael Floreal

Poster Session IV
2:15 p.m. – 3:00 p.m.

Feeding the Mind: The Emotional and Attitudinal Pathways Linking Binge Eating to Body Image
Michael Valuta

Intermarriage and Resilience: Exploring the Role of Cross-Cultural Bonds During the Holocaust
Michelle Garrett Di Scala

Rescue and Prolonged Protection from Fentanyl Overdose with Novel Bioorthogonal Covalent Mu Opioid Receptor Antagonists
Michelle Kirkpatrick

Lost Homelands, New Beginnings: A Virtual Exhibition of Displacement and Resilience.
Miguel E. Bermudez

Assessing the Impact of Medicare Part D on Health Outcomes: A Post-COVID-19 Analysis
Minh Pham

Enhancing Small Language Models with Retrieval Augmented Generation: A Big Data Approach
Minh Tam Nguyen

Investigating the Impact of Theory of Mind on Sarcasm and Empathy Detection
Miranda Kraenzlin

Using CRISPRi to Identify Optimal Target Profile for Beta-Lactam Antibiotics
Miriam Hinds

How the Age of Black Defendants and Victims Affects Mock Jurors' Decisions: A Look Into the Methodology
Miriam Mami & Abigail Heffner

Investigating the Effects of Socioeconomic Status on Employment Associated with ADHD Symptoms
Mitali Chaudhari & Sneha Bhaskarla

Therapeutic Approaches to Treating Chronic Traumatic Encephalopathy and Related Traumatic Brain Injuries
Musa Tumsah Tijjani

Tracing the Footprint of Contamination: Hillsborough County's Environmental History and its Impact on Community Health through Case Studies
Natalie AmRhein

Spaceflight Associated Neuro-Ocular Syndrome
Natalie Brattain & Ashley Lunt

Can Low-Cost 3D Scanning Produce High-Quality Digital Images for Museum Paleontology?
Natalie Giraldo

Towards Cryogenic Noise Thermometry in Nanostructures
Nathan Rao & Glen Romano Gillia

The Impact of Different Modalities of Mental Health Treatment on Drug Treatment Program Participation in Justice-Involved Adolescents
Nebiyou Daniel

Resveratrol Analogs: A New Frontier in Glioblastoma Stem Cell Therapy
Neha Jasti & Brianna Calderon

A Memory and Time Profiling Comparison of Different Processing Modes for the Divisive Amplicon Denoising Algorithm 2 (DADA2) Software
Neha R. Kashyap

A Systematic Literature Review on Water Quantity and Water Quality Modeling Tools
Ngoc Trieu

The Need to Pass: An Analysis of Self-Worth and Societal Expectations
Nicholas Geller

Association of Language Preference and Food Insecurity Status within Caregivers of Pediatric Cancer Survivors
Nicholas M. Beskow

Algorithms for Characterizing Motion-Based Energy Harvesting Reproducibility
Nicholas Rose

Poster Session IV
2:15 p.m. – 3:00 p.m.

The Economics and Politics of Education: A Comparative Analysis of How Public Education Funding Leads to Long-Term Economic Growth and Political Stability
Nicole Ramos Lobato

Art and Anatomy: The Use of Medical Wax Models in the Early Modern Period
Nicole Van

A Study of Cislunar Periodic Orbits in the Circular Restricted Three-Body Problem
Nicole Weeden Martins

First Report of Horsehair Worms (Phylum Nematomorpha) from Plethodontid Salamanders in North America
Nina Haag

Treatment Efficacy of Receptor-targeted Therapy in Migraines
Niveditha Chandrakanth & Javier Todd

Isolation and Host Range Testing of Pseudomonas Aeruginosa Bacteriophage from Florida Water Samples
Niya Patel

Snow Crash: How the Metaverse Enhances Advertising for both Companies and Consumers
Noah J. Levin

Few Places to Learn, Few Spaces to Talk: Reproductive Health Literacy Among Gen Z Women
Noelani Segree

Hispanic Patients with IBD who Underwent Bowel Resection are Less Likely to Receive All-Cause Opioid and Non-Opioid Agents used in Multimodal Pain Management
Nofel Iftikhar

GPCRs in Psoriasis: The Role of CCL20 Chemokine Receptors in Skin Inflammation
Nora Eid & Darya Shirzad

From Boredom to Purpose: How Self-Concept Affects Motivation in the Workplace
Norma Sauri Cintron

Impact of Community Health Workers within Rural Dominican Republic
Olivia Pinilla

Accuracy of Wearable Activity Monitors in Individuals of Different Skin Tones and BMIs During Exercise
Olivia Roeder & Alexis Smith

BIN1: Significant Alzheimer's Risk Gene Mitigating Tau Propagation
Om Patel

Investigating the Impact of Artificial Sweeteners on Viability, Gastrointestinal Motility, and Cancer Metastasis Using Drosophila Melanogaster
Om Patel

Comparative Genomics across Ganoderma Species to Identify Secondary Metabolite Clusters with Cytotoxic Properties
Omobolanle Ayangade, Abril Chao, Emily Abraham, Maya Pasapuleti & Fatima Muhammad

How COVID-19 Impacted the Physical and Mental Health of Latino/Hispanic College Students Before, During, and After the Pandemic.
Ornella Vintimilla & Dr. Fernando Rivera

Scanning Nearfield Optical Microscopy of Polymers
Oscar Sang

Uncovering the Impact of Defaunation on Amazonian Snakes
Owen McCool

CyberGator: A Resilience Assessment Framework for Adaptive Cyber Defense against Advanced Persistent Threats
Ozlem Polat

Correlation Between Beck's Depression Inventory Score and Cardiovascular Reactivity During Submaximal Exercise in Young Adults
Pannonica Silvestri

The Role of Vacancies and Crime in Determining Home Prices
Parker Ridaught & Eliza Terziev

Poster Session IV
2:15 p.m. – 3:00 p.m.

Proteomic Profiling of Tribolium Castaneum via Stearoyl and Oleoyl Fatty Acid Amide Probes
Patrick Jessup

Investigating the Influence of Canvas Mastery Paths in General Chemistry
Paula Libos

Age and Health Predictors of Cannabis Substitution for Alcohol Among Women
Paula Martinez de Pinillos, Dinamaris Aguilar, Radhika Venkatesan & Maiara Fascina

The Impact of Gender and Ethnicity on Subgroup Formation
Payton Wolnik & Livia Nogueira

An Evaluation of the Effect of Gender on Perceptions of Analysts in the U.S. Intelligence Community
Pedro Armona & Samuel Mallay

Monoids Motivated by DNA Origami
Peter Alspaugh

Differences in Heat Tolerance within Coral Algal Endosymbionts
Peter Fisichella

"Problemas Sencillos": Perspectives on Mental Health Disparities Among Working-Class Latinas
Peter Kyriacou

What are 'Western values': Defining the Western canon in higher education humanities
Peyton Harris

Efficient Quantum State Estimation Through Adaptive Bayesian Measurements
Phillip Cornett

Mild and Efficient Cs_2CO_3-Promoted Synthesis of Silyl (Dithio-)Carbonates and Silyl (Dithio-) Carbamates
Phillip Gray III & Colby Lavigne

Misdemeanor (In)Justice
Phoenix Ricketts

Assessing Sublethal Toxicity on Lipid Regulator of Atorvastatin in Embryonic and Larval Zebrafish (Danio Rerio)
Phyllis Wah

Analysis of Chemistry GTA Attitudes on Inclusive Classroom Practices
Pocahontas Halperin

Non-Canonical Relaxin Receptor Agonism to Treat Vascular Calcification
Polina Evdokimova

Antimicrobial activity of Marine Bacteria isolated from Gulf Toad Fish: Opsanus beta
Pragati Adesh & Jose Masso Maldonado

Revealing the role of glia in the evolution of behaviors in Astyanax mexicanus
Pranav Jambulingam

Investigation of Selective Cyclic Peptide Inhibitors Against Mesotrypsin as a Therapy for Tumor Metastasis
Preston Ackerman

Evaluating Conservation Strategies for the Perdido Key Beach Mouse
Providence Pangira

Narratives of Choice: The Role of Media Framing in Shaping Abortion Perspectives
Quenae DeSue

An Automated Approach to Medication Management in Parkinson's Disease
Quinn Yuan

Probiotic Modulation of Inflammation in Multiple Sclerosis: A Study on Lactobacillus paracasei Stimulating Myelin Regeneration
Rachel Abramovici & Laman Aliyeva

Role of Dopaminergic Neuronal Projections from the Medial Orbitofrontal Cortex to Nucleus Accumbens Core Pathway in Cognitive Flexibility and Impulsivity
Rachel Evans

Relevantly Defining an Objective Reality Through Core Theories of Modern Physics
Rachel Tuyet-Nhi Nguyen

Poster Session IV
2:15 p.m. – 3:00 p.m.

The Apocalypse of Zephaniah in Light of the Apocalyptic Genre
Rachel Warren

Cryptococcus neoformans is involved in diverse microbial interactions in pigeon excreta
Rafael Garcia

Utilizing Neural Networks to Predict Italian Roe Deer Movements Overtime
Raul Castillo

Computational Analysis of the Interactions of 3-Aminopropyltrimethoxysilane and 3-(2-Aminoethyl)-3-Aminopropyltrimethoxysilane with Trimethoprim to Develop MIPs to Mitigate Antibiotic Pollution in Water Bodies
Raul Rivero

Finding Lost Archaeological Sites with AI
Raul Rojas & Olivia Zhang

Clue'd in I: Perceptions of Misdiagnosed Clients using Game-Based Pedagogy
Rebecca Harper & Isabel Fonseca

Twahamwe: Reconceptualizing Gikuyu Agency in the Creation of Forest Scouting in Kenya
Rebekkah Hudson

Impact of Prescription Stimulant Misuse on Cognitive Function and Academic Performance Among College Students
Renee B. Korkoske

Implications of Ozempic: A Semaglutide with Peptide (GLP)-1 Receptor Agonists Misused for Cosmetic Weight Loss
Renee Reardon

Evolution of Sequencing Technologies and Implications for Transposon Research
Renita Varghese & Jasneen Meghadri

The Paradox of Pride: Exploring the Suppression of Intellectual Humility in Honor Cultures
Ria Shah

Quantifying Host and Viral PROTEIN REMODELING during HIV REACTIVATION from Latency
Ricardo Roure

Spring-variable mass system: Study with Different Fluids
Ricardo Uzcategui & Paula Pazos

Investigation of a "Snake-Like" Eversion Locomotion Robot for Search & Rescue
Richard Chavez & Alexander Ouellette

Mapping Palmetto Junction: Utilizing CAD and GIS Software for Archaeological Perspective and Methodology
Richard Shoemaker

My Body, Your Choice: How the overturn of Roe v. Wade is emblematic of the U.S. government's abusive treatment of women
Riley Alvero

The Fungal Pharmacy: Techniques of Isolation of Novel Secondary Metabolites from Fungal Species
Riley Grace Bulnes

Contributions of ovarian hormones to executive functioning in aged female Fischer 344 X Brown Norway F1 hybrid rats
Rishi Karpur

Disparities in Maternal Healthcare: Examining the Impact of Social Determinants on Provider Care Quality
Rishita Anumukonda

Investigating the Interaction of Gram-Positive Lactobacillus Species with Mucin In the Context of Barrett's Esophagus.
Ritisha Suresh

Poster Session IV
2:15 p.m. – 3:00 p.m.

Socioeconomic Status as an Indicator of Perceptions about AI as a Healthcare Resource
Rosalie Holderith & Amrutha Venkat

RAISE (Reveal, Amplify, and Implement Strategies for Equity) Qualitative Data Analysis and Next Steps
Rowan Taber-Richardson

Stem Cell-Based Treatments for Spinal Cord Injuries
Roy Chen & Vaishnavi Kota

Hydrophobicity and Water Absorptivity in Fused Filament Fabricated Ultem 9085
Ryan Spence & Carson Rogers

Investigating Resveratrol and its Mechanisms on Drug Resistant Breast Cancer
Ryan Stewart

Federal and State Legal Obstacles to Religious, Personal, and Medical Psychedelic Use
Ryder Rucco & Mason Marks

Predicting a di-Higgs mass through the use of Neural Networks
Ryne Starnes

Global Environmental Injustice and Respiratory Health: The Impact of Redlining, Pollution, and Alveolar Damage in Detroit, São Paulo, Johannesburg, and Delhi
Sammi Rather & Rylie Brooker

Glioblastoma Invasion Relies on Actomyosin Contractility and Metalloproteinase Activity
Shiv Patel, Vidhisha Gautam & Taylor Gogolen

Poster Session V
4:15 p.m. – 5:00 p.m.

Influence of Corrosion Inhibitors on Post-Tensioned Steel Tendons: Mechanisms and Corrosion Monitoring
Sofia Paula Cherrez Reivan

Investigating the Effects of Simulated Microgravity on Yeast Growth and Pathogenicity in Candida parapsilosis and Rhodotorula mucilaginosa
Takara Keely Edamura O'Brien

Validating a Nonintuitive Electrostatic Prediction Through Analytical and Numerical Conformal Mapping
Thach Nguyen

Development of Sulfonyl-γ-AApeptide PROTACs for ß-catenin Degradation and Inhibition of Wnt Signaling in Colorectal Cancer.
Ting Chao

Identifying Orally Bioavailable Compounds Effective at Inhibiting HIV Proliferation
Vishwa Murugappan

Comprehensive Review of Current Literature Surrounding Potential Treatment and Prevention Options for John Cunningham (JC) Virus and Progressive Multifocal Leukoencephalopathy (PML)
Zachary Nesta & Anna Barnes

Tikkun Olam: The Role of Judaism in Achieving Women's Suffrage in the United States
Megan Meese

Motivation for Social Media and Social Media Disorder
Miranda Kraenzlin

Nano-Scale Spectroscopy and Imaging of Biological Assemblies
Ryan Mead & Oscar Sang

Examining the Effect of a High Fat Diet on the Expression of Adipokines in a Murine Model of Barrett's Esophagus
Saagar A. Shah

Genomic Epidemiology of Staphylococcus aureus Sequence-type 72
Sachitaa Senthilkumar & Eva Armao

Femicide Across Borders: South Korea vs. USA
Sadeel Ghazawnah

Activation of human microglia by LPS and neurotensin and human mast cells by Substance P release chemokine IL-8 that is implicated in neuroinflammatory and neurodegenerative disorders
Sai Puneeth Kothuru & Rhitik Samir Joshi

Dietary Supplement use amongst NOVA undergraduate students
Salena Patra

Information Overload
Salvador Victor

The Role of Tallahassee, Florida, in the Civil Rights Movement
Samantha Hall

Kaempferol Exerts Selective Cytotoxicity against Glioblastoma Cells
Samantha Jacynth Louis

Smart Platform for Intelligent Dynamic Exploration and Robust Walking (S.P.I.D.E.R.)
Samantha Kammerer & Ethan Shelstad

Summer Fashion Trends Among College Students in the United States and Italy
Samantha Luc & Dr. Wendy Chase

A Tale of Two Networks: Unraveling the Role of Crime Generators and Attractors in Neighborhood Offending Patterns
Samantha Waterston

The Psychological Effects of Prison on Pregnant Female Inmates
Samantha Yearwood

Barriers And Facilitators To Music Therapy Implementation In Nursing Homes For Dementia Patients: A Scoping Review
Samanthaka Nandam

Poster Session V
4:15 p.m. – 5:00 p.m.

Exploring Gender Differences in Perceptions of AI's Impact on Social Media
Samkit Bothra

Bacterial Art: Connecting Art, Biology, Engineering and Entrepreneurship
Sammi Rather, Rylie Brooker, Anika Bhandare & Jarrod Wheelus

The Black Panther Party and the Pursuit of an Equitable America
Samuel Addo

Does Activation of mTOR Promote Increased Alzheimer's Disease Pathology?
Samuel Whitehead

CuNi2Zn As Potential Hydrogen Evolution Reaction Electrocatalyst
Samuel Won

The Ultimate Defense: Investigating Neutrophil Mechanisms Against Aspergillus Fumigatus
Samyukta Kandarpa

Racial Narratives, Cultural Identity, and Maternal-Infant Health: A Critical Discourse Analysis of Race and Breastfeeding in Black Media
Sanjana Bhatt & Mahi Patel

Salivary MicroRNAs: Biomarkers for Oral Cancer
Sarah Baydoun

Digging Deeper Into Tell Yunatsite: Insights From the 2024 Field School Excavation
Sarah Boyd

Exploring Protein Networks Driving Heart Regeneration in Axolotls
Sarah Newcomb

Catholicism, Gender-Affirming Care, and the Transgender and Gender Non-Conforming Community
Sarah Wutzler

The Effect of Parasitism on Coquina Clam (Donax spp.) Burial Behavior
Sarah-Kate Srivastava

The Use of Cannabidiol (CBD) as a Combination Treatment for Glioblastoma
Sashank Bikkasani

How Intellectual Humility Affects certain Bias Blind Spots
Scott Karnes, Everett Robertson & Ingrid Escalante García

Fire Ants Survive Raindrop Collision Forces and Dispersed by Outspreading Drops
Sebastian Anzola & Freddy Zeas

Assessing the efficacy of various myelin enhancing compounds with Lumbricus terrestris
Sebastian Lopez & Ekansh Puri

In silico NCS1 and DREAM Conformational Variation Based On Binding Metal Identity
Sebastian Scavuzzo & Britnis Blanco

ScrA, a novel regulator of adhesion, is controlled by a coordinated and complex network of regulation in Staphylococcus aureus
Selina Walker

Association Between Body Mass Index and Cardiovascular Responses During Eucapnic Voluntary Hyperpnea Among Young Adults
Sequoia Ernst

Building a Bimetallic Tripod Pincer System Catalyst for Investigating Electrocatalysis of CO_2 Reduction
Shaaz Mumtazali

The 10 Year Check-Up: Assessing Syngnathid Populations in the Indian River Lagoon
Shakira Brown & Keyaira Waring

Decoding Parental Vaccine Decision-Making and Hesitancy through Social Media Discourse
Shania Shahab

Microplastic Presence at surface and depth on high-density and low-density Sea Turtle nesting Beaches in Volusia County, Florida
Shaunace Bowen & Trinity Resnover

Poster Session V
4:15 p.m. – 5:00 p.m.

Tooth by Tooth: Investigating Isolated Crocodyliform Teeth from the Paleocene-Eocene of Tropical South America
Shion Newsom

Yoga Nidra Enhances Mood Through Neural Engagement and Sleep Modulation
Shravya Konatam & Bharath Burri

Exploring the Role of Relaxin-3 Peptides in Metabolic and Eating Disorder Pathophysiology
Siddharth Yerrajennu & Junjie Zheng

Entrepreneurs Make You Fly: The Business of Private Aviation
Sierra Nevins

Survey of Reproductive and Digestive Health Symptoms: The Effects Oral Hormonal Contraceptives on Young Women's Health
Silviana-Elena Buzatu

CD25-targeted IL-2 therapy during Influenza A virus infection does not impede the generation of virus-specific antibody
Siva Annamalai

NGC 2168 Cluster Age
Skylar Butler

What is the Relationship Between the Perceived Availability of Third Places and the Self-Reported Loneliness of Gen Z?
Skylar Holm-Martinez & Skyler Krampitz

Role of Latrophilins in Cancer Biology
Sneha Bhaskarla & Sharmitha Suresh

Investigating Mechanisms of Antioxidant Treatment on Drug Resistant Breast Cancer
Sofia Ines Cuello

Effects of media composition and temperature on the morphology and motility of a halophilic archaeon
Sofia Jolley

Evaluating Inhibitor Performance for Corrosion Protection of Post-Tensioned Tendons
Sofia Paula Cherrez Reivan

Targeting STAT3: An Approach to Reducing Neuroinflammation in Autism Spectrum Disorder
Sofía Profeta

Prestige Orientation and Crucial Feedback
Sofia Villanueva

An Analysis of the Relationship between TikTok Screen Time and Intensity of Political Beliefs Amongst Daytona State College Students
Soleil Skrocki

GPCR Dysfunction in Schizophrenia: Role of Serotonin and Dopamine Receptors
Sona Patel & Darya Shirzad

Parents' Attitudes Regarding Therapy: Understanding how Parents' Opinions on Their Adolescents Autism Diagnosis Impacts Their Child's Developmental Progression
Sophia Alvarez

Composition and Light: The Lady of Shalott in a Pre-Raphaelite Mirror
Sophia Calderon

Minimal Degradation of Pha Straws in Tampa Bay Summer Conditions
Sophia DiPaola & Maggie Tomaszewski

Bridging Minds: Attributing Consciousness to AI and Trust Implications
Sophia Sakakibara Capello

Cytotoxicity and Toxicological effects related to e-cigarettes use
Sophia Victoria Jerez, Trinidad Argüelles M.S., Ed.D, Claudia Sánchez MSFS & Maria M. Monzon Ph.D.

Blood Pressure Reactivity During Isometric Handgrip Exercise Between Adults With and Without Obesity
Sophia Vizoso

Lacquer and Legacy: Opening the Box to Soviet Narratives and Post-Soviet Realities
Sophie Maclayne Works

Poster Session V
4:15 p.m. – 5:00 p.m.

Sexual and Reproductive Health Access Among Racial/Ethnic Minority College Students
Srithanvi Pasunuri

Parental Support with College and Career Guidance in Adolescence
Sriya Grandhi & Roy Chen

The Future of Active Learning: The Efficacy of AI-infused Study Techniques
Stacey Hoffmeister, Mary Morgan & Jacob Gay

Fabrication & Characterization of Composite PEG Granular Scaffolds with Aligned Micropatterned Pores
Stephanie Manrique

Associations of Physical Activity with Activities of Daily Living, Instrumental Activities of Daily Living, and Cognitive Impairment Among Chinese Older Adults
Stephanie Morera & Hannah Haddick

Modeling the Effect of Tumor Associated Macrophages (TAMs) on Ovarian Cancer Population Dynamics and Acquired Resistance
Steven Robles Blasini

The Relationship Between a Novel Measure of Dating and Sexual Protective Behavioral Strategies (PBS), the Sexual and Negative Dating Inventory (SANDI), and Alcohol Use
Sthefani Paitan & Joliza Maynard

The Intersection of ASD and Mental Health: A Focus on College Students
Sudeepta Matha

Ethical Implications of Artificial Intelligence (AI) in Surgical Robotics
Sudhiksha Maramraju & Aditi Ragothaman

Integrating Technology and Empathy in Postpartum Depression Education
Sujehnna Walker

Green Generation Gap
Sumaia Naga

Beyond The Pink Tax: An Exploration of Personal Finance & The Economy
Sydnee Scully

Determination of Morphological Differences Between Bottlenose Dolphins Based on Sex and Age
Sydney Haas

Investigating Biomarkers for Neural Plasticity Using Non-Invasive Brain Recording
Syed Yahya Raza

Method Development for the Qualitative Analysis of Biochars
Sylvia Long

Exploring the Relationship between Exposure to Disinformation on Climate Change Posted on Instagram and DSC Students' Outlook on the Future
T. Corey Bickley & Aidan T. Hale

Enhancing Inflammatory Bowel Disease Treatment with pH-Sensitive Drug-Polymer Complexes and Advanced Electrospray Methods
Takara Keely Edamura O'Brien & Rahela Dolha

Designing Small-Peptide Inhibitors Targeting the N-Terminus and Central Hydrophobic Core of Aß40
Tatiana McFarlane

Using Environmental DNA (eDNA) to Understand the Biological Diversity of Soil Microbiomes in South-Central Florida
Tatiana Guerra

Exploring Dental health and perceptions of holistic dentistry among community college students.
Tatianni Pinkston

How an Occupational Exoskeleton Affects Users' Comfort and Perceived Exertion
Tatyana Balashova & Satabdee Purkayastha

What Chemical Cues Do Larval King Crabs Use to Find a Home?
Taylor Alexis Queen

Poster Session V
4:15 p.m. – 5:00 p.m.

The Universal Mass Function and its Applicability to Organic Molecules
Taylor Butler & Raquel Walton

What is the effect of dietary carbohydrate load on postural symptoms in POTS patients?
Taylor Combe

In the Eyes of the Consumer: Food Label and Safety in America
Taylor Smith

Beyond Algorithms: How Artificial Intelligence Could Pose as A Threat to Humanity
Teray Sylvester Bembery

Local Electric Fields Dictate ReactivityTrends in a-Ketoglutarate Dependent Non-Heme Iron Enzymes
Terence S Oscar-Okpala

Resistance of Thin Film and Spherical Shell: A Two-Node Approach
Thach Nguyen

Isothermal Viral RNA Amplification and Detection with an Electrochemical Microfluidic System
Thais Ortiz Rodriguez

Antibiotic Research Communication Through Video
Theodore Fenske

Investigation of Fe(otf)3 as a Photocatalyst
Thomas Brumback

Laboratory Investigation of Laser Propagation Decay in Scattering Media
Thomas Deyo

Using Drawings to Compare Groupmates' Experiences in an Introductory Physics Lab
Tiffany Snow & Charlotte Dries

Selenocysteine, the Forgotten 21st Amino Acid, and its U-shaped Effects on Cancer Development
Ting Chao & Sandra Mampilly

Basigin Expression in Adolescent Mouse Neural Retinas Is Not Affected by the Stress Hormone Cortisol
Tireign Lindsay

Exploring Neuroevolution: Can Evolved Neural Networks Detect Cyberattacks?
Tyler Donay & Regan Bossie

The Impact of Adverse Childhood Experiences on Binge Eating in College Students
Tyler Favier

Insights on AApeptides as they relate to Inhibiting the p300 CH1 domain
Tyler JT Lambert

Of Course She's A Cynic: An Exploration of Agency and Cynicism in The Women of Lavinia by Ursula Le Guin
Tyra DiMatteo

Generative AI Policy Use in U.S. Master's in Health Informatics Programs
Uloma Odigbo & Anya Wong

Argentinian Mate
Valentina Spalletta

Happiness Among Puerto Ricans in Florida: Factors and Considerations
Varun Nannuri

Advancing Gene Therapy Techniques for Type 1 Diabetes: A Meta-Analysis Review
Vedaant Mutha & Eavin Valerio

Comparison of Biochar-Enhanced Bioretention Systems with Free- and Elevated-Drainage for Nitrogen Removal from Urban Stormwater Runoff
Vicky Lopez & Julia Manser

The Conundrums of Consciousness
Victoria Adelina Montalvo

Virtual Battles, Real Consequences: Casualty Aversion by Subject Matter Experts in Virtual Combat Scenarios
Victoria Becker Steiner

Poster Session V
4:15 p.m. – 5:00 p.m.

Fruits and Vegetables: Catalase Inhibitors
Victoria Hendricks

Stearoyl-CoA desaturase 1 (SCD1) CRISPR-Based Knockout in Hepatocellular Carcinoma and its Impact on cell Metabolism
Victoria Rios Ocasio

HBA1/2 mRNA Expression in UV Exposed Melanoma Cells
Victoria Sulaman & Victoria Woodcock

Traction Force Microscopy in Glioblastoma Invasion
Vidhisha Gautam & Taylor Gogolen

Lactate Receptors in Muscular Function and Disease.
Vincent Yang & Nathan Tran

The James Museum's Art in Mind Program Evaluation
Violet Adams & Isabel Reiter

Utilizing pneumatic muscles to simulate wingbeat kinematics for a morphing wing
Vireli Anbarasu & Roshan Ramnarine

Targeting Proton-sensing Receptors in Cancer
Vishwa Murugappan & Matthew Lim

Evaluating University Faculty Perceptions of AI in Higher Education: A National Survey
Willa Gutowski

Understanding Consumer Response to Polarizing Promotions: An Eye-Tracking Analysis
William Hartman

The Modern Panopticon: Performance and Behavioral Outcomes of Advanced Employee Performance Monitoring
William Tang

Increased Longevity of Hydrophilic Property of PDMS for Capillary Pumping Pressure
Wyatt Smith & Sayyada Harry

SCANDAL OF THE STARS: Hollywood's Cancel Culture Carnage
Xavier Harris

Lumped Element Modeling of High-Temperature Piezoelectric Pressure Sensors for Space Applications
Xiya Zhou

Prevotella corporis prevents and reverses toxic protein aggregation by activation of a protecitve stress response
Yoan Manuel Argote

Development of Tumour-targeting Plasmids for Salmonella-based Cancer Therapy
Yu Wei

Kaempferol Induces Apoptosis in Glioblastoma cells via a Pro-oxidative Mechanism
Yuliet Martinez

Innovating Hope: Commercializing Affordable and Accessible TMA Biosensor Technology
Zachary Asarnow & Ava Polly

Differentiation of Nylon Samples Exhibiting Visually Indistinguishable Fluorescence via Synchronous Fluorescence Spectroscopy
Zachary Holender

The Potential Role of Molecular Chaperones in NGLY1 Deficiency
Zachary Jones

The Role of SLC6A Gene Variants in Neuropathologic Function: A Systematic Review
Zachary Nesta & Anna Barnes

Water Entry Dynamics of Hydrophobic Spheres Through Cylindrical Pipes
Zamar Joseph & David Vidana-Fuentes

Out of Bounds : The Impact of Social Media on Student Athletes
Zoe Jordan

Poster Session V
4:15 p.m. – 5:00 p.m.

Investigation of Structure-Function Relation of Oxalate Decarboxylase
Zoe Ringewald, Morgan Bonk, Zoey Chang, Nitish Nandineni, Mahi Athar & Dr. Angerhofer

Investigation of Social Anxiety Subdimensions in Response to Approach-Avoidance Task
Zoe Steelman

AI Course Companion
Zyad Abd-Elrahman

Poster Session I – Abstracts

Implication of nitric oxide (NO) signaling in Staphylococcus aureus

A'mya Chin

Dr. Kelly C. Rice and Connor Meenan

Staphylococcus aureus poses a significant health threat due to its metabolic versatility and antibiotic resistance. S. aureus nitric oxide (NO) production modulates its respiration and contributes to virulence. To understand if this NO affects non-NO producing S. aureus cells, we are optimizing the use of green fluorescent protein (GFP) NO sensors. We will also engineer Escherichia coli (E. coli) to express GFP when exposed to NO, and will use this strain in co-culture to determine if S. aureus NO is sensed by E. coli. These studies will determine if S. aureus NO can travel intercellularly, and if it impacts non-NO producing cells.

University of Florida

Characterization of Tetratricopeptide Proteins in Borrelia Burgdorferi

Aaditya Balasubramaniyan

Dr. Mollie Jewett

Lyme disease or Lyme borreliosis (LB) is the most common vector-borne disease in the United States. LB is caused by spirochetes from the genus Borrelia with Borrelia burgdorferi (Bb) being most prevalent in the US. Currently, there is no vaccine for LB and treatment is based on the use of antibiotics. To fully understand and treat LB, we must understand Bb's mechanisms of infection. However, approximately 60% of Bb proteins have unknown functions. The Bb chromosome encodes 14 annotated tetratricopeptide repeat proteins (TRPs). TRPs are specialized polypeptides involved in protein-protein interactions and play important roles in many bacterial pathways due to their exceptional binding variety. 11 of the 14 Bb TRPs have no known function. The Bacterial Adenylate Cyclase Two-Hybrid System Kit (BACTH) is a system that detects protein-protein interactions using the catalytic domain of adenylate cyclase (CyaA). CyaA is made up of two fragments, T25 and T18, which together produce cyclic AMP (cAMP). Proteins of interest can be cloned as in-frame fusions with T25 and T18 and an interaction between them results in cAMP production which is detected by a colorimetric assay or bacterial growth on a selective medium. The BACTH system will be used to identify the proteins that interact with TRP proteins in Bb. Seven TRPs have been successfully cloned into pKT25 and are in the process of being transformed with pUT18 Bb genomic DNA library. Identifying the protein binding partners of the TRPs can provide insight into the unknown functions of these crucial proteins.

University of Central Florida

The Home Clinic: Development of Highly Reproducible Paper Sodium ISE for Home Testing.

Aaron Markowitz & Henry Lopez

Dr. Karin Chumbimuni Torres

Ion selective electrodes (ISE) are a unique, versatile analytical tool that have potential use in clinical testing, with current testing methods often being invasive, expensive, and time-consuming. This often causes these vital health procedures to become inaccessible to many people. There is now a need for cost-effective, accessible, and reliable testing methods that people can access without the need of a clinic or professional, and that can be produced efficiently with minimal preparations and time. Herein, we propose the use of highly reproducible paper sodium ISE's for at home testing without the need of a calibration step. Paper electrodes were fabricated by integrating single-walled carbon nanotubes (SWCNTs) with poly(3-octylthiophene) (POT) and applying them on a filter paper substrate. These electrodes were tested with 150 µL sample of artificial saliva and should demonstrate high reproducibility, and low standard deviations in their potentiometric readings. It is our hope that these tests will lead to the development of affordable and reliable at home tests for different diseases or health concerns.

University of Central Florida

Novel Synthesis and Magnetic Properties of van-der-Waals Material PrOI

Aashutosh Pokharel

Dr. Michael Shatruk

The discovery of 2D materials beyond graphene had also revived interest in the study of low-

dimensional magnetic systems, especially regarding 2D magnets that can demonstrate unusual evolution of magnetic properties as a function of the sample thickness. Such 2D magnets hold promise as materials for next generation spintronics and integrated circuits. Even though extensive studies have been dedicated to this research area in recent years, the scalable synthesis and heterostructure assembly of such magnetic nanosheets remain challenging and underexplored. These challenges can be overcome by the development of liquid-phase exfoliation methods that can provide a scalable pathway to the synthesis of 2D magnets and further investigation of their chemistry and assembly in solutions, akin to the evolution of the chemistry of nanoparticles over the last four decades.

In this contribution, we present results of our studies aimed at the synthesis and large-scale exfoliation of PrOI, a layered oxyhalide. The oxyhalides of rare-earth elements have been an intriguing candidate for the exploration of magneto-structural studies. We have synthesized layered PrOI by chemical vapor transport and the material crystallizes in the tetragonal space group P4/nmm. We have developed a new synthetic strategy for the large-scale production of PrOI and optimized the reaction conditions to the desired product we needed. We have extensively investigated the material through X-Ray Diffraction and Electron Microscopy. We discuss the effectiveness of the exfoliation methods for this material and the evolution of their magnetic properties as a function of the exfoliation conditions.

Florida State University

Evolutionary Optimization of Biologically-Inspired Mechanistic Input-Output Neural Circuit Models in the Auditory Pathway

Abdul-Malik Zekri

Dr. Ankur Mali

Understanding how neural circuits compute specific cognitive functions is a fundamental challenge in neuroscience, with profound implications for artificial intelligence, neuromorphic computing, and neurological health. This study employs evolutionary meta-heuristic algorithms to optimize a mechanistic input-output spiking neural network (SNN) model of the cochlear nucleus, a key circuit in the auditory pathway. The research integrates biologically inspired initialization, iterative optimization, and empirical validation to explore how connectivity and topology influence input-output relationships in neural circuits. SNNs are initialized with biologically plausible parameters, and their connectivity, synaptic weights, and delays are refined using spike-timing-dependent plasticity (STDP) and other learning rules. Fitness is evaluated based on the accuracy of replicating experimentally observed input-output patterns. The optimization is performed in parallel across a population of networks to enhance computational efficiency, with characteristic motifs in the optimized architectures analyzed to uncover their functional significance. This approach not only seeks to replicate the computations of biological circuits with high fidelity but also provides insights into the principles underlying neural circuit architecture. Preliminary findings are expected to demonstrate that SNNs can accurately mimic biological computations, offering a scalable methodology for computational neuroscience. This work also has the potential to reduce the computational and time demands of traditional connectomic reconstruction by learning circuit architectures directly from empirical input-output data. Additionally, these results could inform the design of energy-efficient neuromorphic hardware, test hypotheses about auditory signal processing, and guide neural architecture search (NAS) methods for artificial neural networks.

University of South Florida

The effects of bilirubin on intrinsic apoptotic pathways in MDA 231 epithelial breast cancer cell lines

Abigail Francis & David Mejia

Nicole Verity

Bilirubin, an essential constituent of cellular signaling pathways, may play an important role in mediating the cell cycle and initiating apoptosis in breast cancer cells, although the biochemical relevance still remains unclear. The purpose of this research project is to investigate the molecular mechanisms underlying bilirubin-induced apoptosis and cell cycle arrest in epithelial breast cancer cell lines. Given this, it is hypothesized that bilirubin will induce apoptotic pathways in MDA 231 breast cancer cells by mediating growth inhibition and promoting cell cycle arrest. This will be accomplished by conducting the trypan blue cell viability assay followed by apoptotic immunofluorescence and the expression of apoptotic and cell-cycle related genes via RT-qPCR, both before and after bilirubin treatment. Will this project, I hope to establish a relationship between bilirubin and cell viability, intrinsic apoptosis via mitochondria membrane permeability, and cell proliferation via cell cycle arrest through the analysis of four crucial genes,

p53, Bax, AhR, and cyclin D1. This research attempts to establish a link between bilirubin and intrinsic apoptosis by increasing the levels of pro-apoptotic proteins and decreasing the levels of mitochondrial-mediated cell death.

University of Central Florida

Standard in the Rinse

Abigail J. Crossman

Dr. Willis Jones

Standard in the Rinse (SIR) is a novel calibration method in which the calibration curve is prepared by "rinsing" the instrument suite with a standard containing all analytes of interest instead of a clean blank solution. All measured samples are spiked with an internal standard (IS), used to monitor the amount of sample present in the system during the measurement. The "rinse" solution contains all analytes of interest at known concentrations, and a second IS. The instrument measures the changing signal levels as the autosampler switches from sample to rinse, resulting in an increase of the IS in the rinse, a decrease of the IS in the sample, and the corresponding change in the analyte signals. This setup completely bypasses the need to prepare a series of standard solutions of known concentrations, as samples are simply loaded into an autosampler, and the calibration is performed by rinsing out the sample with the standard solution. Two curves are prepared for each analyte, with analyte signal on the y-axes and the two IS species on the two x-axes. The y-intercepts of these two plots give the analyte signal measured purely in the sample and the rinse, respectively. The concentration of analyte in sample is calculated using only the two y-intercepts and known concentration of analyte in the rinse solution. Proof-of-concept measurements for SIR were obtained using a suite of analytes spiked into purified water, and the method was further validated through the analysis of certified reference materials with recoveries ranging from 98-109%.

University of North Florida

The Effects of Blue and Green Crab Grazing on Eelgrass Transplants in Sage Lot Pond, Waquoit Bay

Abigail Kauke

Mirta Teichberg

Eelgrass, Zostera marina, has been disappearing from the Atlantic coasts of North America and Europe since the 1930s. Within Massachusetts, Cape Cod and Buzzards Bay have lost 65% of their seagrass within the past three decades. To assess the feasibility of seagrass restoration in Waquoit Bay, seagrasses from a local donor site, Little Pond, were transplanted into Sage Lot Pond in Waquoit Bay. Over the course of a month, transplants had only a 4% survival rate. It was hypothesized that crabs were grazing on the transplants. To test this, exclusion cages and open plots with seagrass transplants were placed into Sage Lot Pond. Seagrass loss was high in open plots while seagrasses in the cages were left untouched. To further investigate the feeding behavior of crabs in the Bay, blue (Callinectes sapidus) and green (Carcinus maenas) crabs were placed in tanks with seagrass transplants and monitored. Over four days, crabs were found to graze rhizome and sheath tissue. This study shows that both native blue crab and invasive green crab grazing can have a negative effect on attempted seagrass restoration and that measures need to be taken to prevent crab grazing on transplants in future restoration projects in the region.

Eckerd College

Anthropogenic Disturbance Affects the Presence of Antibiotic-Resistant Salmonella in Urban Birds

Abigail Kirkpatrick & Alexa Pappalardo

Dr. Amber Brace

Since the discovery of penicillin and the subsequent "Golden Age" of antibiotic discovery and use, humans have been driving the rapid evolution of antibiotic resistance in bacteria, which has emerged due to overuse in domesticated animals. As antibiotics continue to be introduced to the environment through irresponsible practices, selection for resistance genes in bacteria is resulting in increased exposure of wild animals to antibiotic-resistant pathogens. Additional pressures on wildlife, including rapid and extensive urbanization, cause inevitable increases in physiological stress, leading to increased infection risk in these animals. When species congregate around resources such as feeders, the higher density of individuals also has the potential to increase pathogen spread, including antibiotic-resistant Salmonella species. In turn, these resistant bacteria can spillover into human populations, especially in urban areas where human-wildlife interactions are common. Indeed, urban bird species such as blue jays, mourning doves, and cardinals are known carriers of zoonoses, including pathogenic Salmonella. Here, we used camera-trapped bird feeders to examine the relationship between environmental

disturbance and the prevalence of antibiotic-resistant bacteria (ostensibly Salmonella) in an urban population of birds. Our results suggest that increased levels of anthropogenic disturbance lead to a higher likelihood of antibiotic-resistant bacteria on and around bird feeders. This research will help elucidate whether differing levels of human disturbance can represent potentially greater risks for human and animal health.

University of Tampa

Rover Wheel Trafficability and its Impact on Reflectance Spectra and Thermal Distribution of Engineering-Grade Lunar Highlands Regolith Simulant (LHS-1E)

Abigail S. Glover & Myles Hoskinson

Dr. Kerri Donaldson Hanna

The Lunar Vulkan Imaging and Spectroscopy Explorer (Lunar-VISE) mission will explore the Moon's Gruithuisen domes to investigate undisturbed and disturbed rocks and regolith properties through high-spatial resolution spectral imaging. As the rover traverses the lunar surface, interactions between its wheels and the regolith surface layer may alter the terrain's physical properties, potentially impacting spectroscopic observations and interpretations of pristine rock and regolith composition. Understanding these interactions is crucial for ensuring the accuracy of Lunar-VISE's findings and enhancing our ability to study lunar geologic phenomena to prepare for long-term exploration and habitation.

Spectral data on engineering-grade Lunar Highlands Simulant (LHS-1E) was collected under loose and compacted conditions using the contact probe on an ASD LabSpec 4. The reflectance was measured with the probe in contact with the simulant and slightly above its surface to simulate potential variability. Within the Regolith Interactions for the Development of Extraterrestrial Rovers (RIDER) testbed, thermal distribution changes were evaluated in LHS-1E under varying compaction states due to a 100 N force from an Astrobotic Polaris rover wheel. Heat was applied to the simulant's surface, and images were captured using a FLIR Boson thermal camera.

Preliminary results suggest that rover activity does not significantly influence regolith reflectance through compaction. Beyond Lunar-VISE, this research offers broader implications for lunar exploration, informing the design of sustainable infrastructure and operational protocols. By understanding how surface interactions impact regolith properties, scientists can better prepare for long-term habitation, resource utilization, and constructing permanent extraterrestrial bases.

University of Central Florida

Exploring Amplitude-Induced Variability in the Tree Shrew Visual Cortex: A Computational Approach

Abigail Shepard

Dr. Rodrigo Pena

The visual cortex constitutes an integral part of the brain responsible for processing external visual stimulation. Neurons in this area have preferred responses to orientation, a phenomenon known as orientation selectivity. While gathering firing responses from the tree shrew cerebral cortex, collaborators from the Max Planck Florida Institute at the Fitzpatrick Lab observed a new avenue of response variability linked to the amplitude of the stimulation. We hypothesize that the network architecture coupled with selective activation of the specific neurons can explain this phenomenon. As a proof of concept, we aimed to develop a biophysical computational model to replicate the amplitude-induced response. Our findings show that specific populations targeted by stimulus activation replicate observed response patterns. We have also linked the patterns to specific simulated connections utilizing artificial neural networks, and we expect that this framework will allow seamless identification of network architecture.

Florida Atlantic University

The Seasonal Distribution of Polycera hummi in Tampa Bay

Abigail Wilson & Grace Ferguson

Dr. Michael Middlebrooks

Despite their bright colors and ecological significance, many nudibranch species are significantly under-represented in literature. One such understudied species is Polycera hummi, which inhabits the east coast of the United States in subtropical waters. While P. hummi has been previously recorded in Florida, little is known about the nudibranch's population structure, feeding habits, and reproductive behavior. The goal of this study is to assess the seasonal distribution of Polycera hummi and gather ecological data on its diet, with a focus on its proposed prey Bugula sp. Sampling is conducted monthly in a seagrass bed in Tampa Bay to describe the population abundance of P. hummi and Bugula sp. Collected specimens of P. hummi are examined to record

the size of P. hummi and any variations throughout the year. Data will also be analyzed to examine the relationship between the sea slug and its prey. Preliminary data suggests a correlation between the abundance of Polycera hummi and Bugula sp. populations. In May, 30 P. hummi individuals were collected, along with 848 individual colonies of Bugula sp. However, by September and November sampling, both P. hummi and Bugula sp. were absent from the collection site. This indicates a significant decline in the population of P. hummi from summer to fall, corresponding with the decrease in Bugula sp abundance. A better understanding of the population dynamics and ecology of Polycera hummi will provide valuable insights into the species' life history and ecological role, paving the way for future research on this nudibranch.

University of Tampa

Electromyographic Prostheses: A Novel Approach to Evaluate and Train Multi-gesture Controls

Abrianna Lalle

Albert Manero

Upper limb prostheses must meet functional demands of daily life [1]. Electromyographic (EMG) prostheses have gained popularity for having increased capabilities and fewer reported cases of device abandonment [2]. Lack of functionality is cited as a factor of upper limb prosthesis rejection rates [3]; thus, there is a need to assess and expand physical capabilities with EMG prostheses [4, 5]. Despite growing availability of myoelectric devices [6], there is little data providing insight into how many gestures can be feasibly handled by novice users compared to experienced users. With more gestures to perform, there may be a tradeoff of training time and cognitive workload [2, 7] required to differentiate various controls [8, 9]. This study seeks to explore performance and perceptions with a maximum of 5 distinct surface EMG gestures in one session. A training and evaluation instrument was developed based on our pre-existing calibration app technology to evaluate multi-gesture performance [10]. First-time EMG users will participate, and cohorts differ in the number of distinct zones of control. Providing three rounds of fifteen randomized cues assessed performance in accuracy among four cohorts. Results will cultivate a better understanding of how the general population first interacts with this multi-gesture training and progression of distinct muscle contraction intensities. Continued work will consider cognitive workload and performance benchmarks to suggest appropriate progressions of gesture capabilities, including a comparison between a new and experienced user. Insights will help researchers standardize initial capabilities and progression among future device users.

University of Central Florida

Investigating the Role of Net1 in Motor Exit Point Myelination

Addison Manofsky

Dr. Laura Fontenas

For over a century, Oligodendrocytes and Schwann cells have been known to myelinate central nervous system (CNS) and peripheral nervous system (PNS) axons, respectively. Recently, a unique glia responsible for myelinating the region between these two cell populations at transition zones, Motor Exit Point (MEP) glia, was discovered. This cell type originates in the developing spinal cord, migrates to the periphery, and restricts movement of oligodendrocyte precursor cells (OPCs) into the PNS. The mechanisms that control MEP glia specification, migration, and regulation of OPC passage into the periphery remain largely unknown. We previously identified neuroepithelial cell transforming 1 (Net1), a Rho guanine nucleotide exchange factor (GEF) implicated in cell proliferation, invasion, and migration, as being expressed in zebrafish MEP glia at their time of migration. Here, using primer design, CRISPR/Cas9 gene editing, Sanger sequencing, and fluorescence microscopy, we generate Net1 crispants and evaluate Net1's role in MEP glia's regulation of OPC migration and MEP transition zones. Our data demonstrate that Net1 is crucial for preventing ectopic OPCs in the periphery and maintaining proper organization of myelinating glia at and surrounding the transition zone. With their unique, migratory nature, central and peripheral characteristics, and role in regulating the CNS/PNS barrier, MEP glia present a potential treatment avenue for demyelinating diseases, which often affect half of the nervous system and have no known cures. By highlighting the role of Net1 in MEP glia's regulation of the CNS/PNS barrier, this study paves the way to potential breakthroughs in the treatment of neurological diseases/injuries.

Florida Atlantic University

Effect of Excess Ca(OH)2 on Initiation of Localized Corrosion of the Steel in a Concrete

Adelia Abdykerimova

Cristopher Alexander

Steel-reinforced concrete is known for its strength and durability, yet corrosion of the embedded steel can lead to structural deficiencies and costly repairs. The high pH of concrete pore solution promotes a protective passive oxide layer on steel surfaces. However, exposure to atmospheric carbon dioxide or chlorides can result in steel reinforcement corrosion, often initiating as localized pits due to a local drop in pH. Fortunately, concrete formulations typically include dispersed calcium hydroxide particles that act as pH buffers.

This research examines the effect of excess calcium hydroxide ($Ca(OH)_2$) on the initiation of localized corrosion of steel in concrete, aiming to understand its role in maintaining the passive state and increasing the chloride threshold for corrosion initiation. The study involves simulating steel-concrete conditions by depositing a layer of $Ca(OH)_2$ on a steel surface and examining corrosion initiation through visual observation, electrochemical testing, and the Scanning Vibrating Electrode Technique (SVET). SVET was employed to detect localized anodic and cathodic sites, providing spatially resolved insights into the onset and progression of corrosion activity.

Electrochemical methods included monitoring open circuit potential (OCP) and periodic electrochemical impedance spectroscopy (EIS) to assess the corrosion state. The presence of $Ca(OH)_2$ is expected to delay corrosion initiation, enhancing steel's durability in concrete.

Understanding $Ca(OH)_2$'s role in preventing localized corrosion has significant implications for maintaining durable concrete structures. This research highlights mechanisms of corrosion inhibition, potentially guiding improved construction practices and more durable infrastructure. Future studies will verify these findings under varied environmental conditions and expand SVET's applicability.

University of South Florida

Identifying the Link Between Traumatic Brain Injury and Alzheimer's Disease

Aditi Gorthy

Dr. Coleen M. Atkins

In the United States, most traumatic brain injuries (TBI) are mild and only result in transient neurological abnormalities. However, a history of mild TBI (mTBI) increases the risk of developing Alzheimer's disease (AD). Clinically, individuals with either AD or mTBI alone present with hippocampal-dependent learning and memory deficits. Hippocampal neurons are prone to mitochondrial dysfunction after TBI due to their high energy demands. Mitochondrial functioning is associated with cAMP/PKA signaling and upon injury or AD onset, there is decreased cAMP/PKA signaling due to an increase in cAMP hydrolysis mediated by phosphodiesterases (PDEs). Inhibition of PDEs, specifically the isoform PDE2, improves learning and memory in models of AD. We hypothesized that mTBI during the pre-symptomatic phase of AD would worsen lesion volume and inhibiting PDE2 would reduce these effects. To test this, male and female wild-type and pre-symptomatic AD mice received either an mTBI or sham surgery at 2 months of age and were treated daily with vehicle or the PDE2 inhibitor, Bay 60-7550 for 3 days, starting 30 minutes post-surgery. One month post-surgery, animal brains were removed, fixed, sectioned into a stereological series, and stained. Another group of animals was assessed at 3 months post-surgery for cognitive functioning using contextual fear conditioning. AD mice that received mTBI demonstrated significant cognitive deficits which were rescued with Bay 60-7550. Current studies are underway to determine if these improvements with Bay 60-7550 are mediated by a reduction in lesion volume. These findings will enhance our understanding of the pathophysiology of mTBI and AD.

Nova Southeastern University

Importance of the Pregnant Women's Microbiome to Developing Fetuses.

Adrienne Ulany Perez

Mintoo Patel

The placental microbiome is an important factor in a woman's pregnancy and a major factor in the health of both her and her fetus. Many studies have shown that periodontal disease and pre-existing conditions such as preeclampsia and leaky gut syndrome can affect the outcome of a woman's pregnancy and cause imbalances in her hormones and overall health. Specific bacteria such as Firmicutes, proteobacteria, and lactobacillus have shown significant differences between healthy and non-healthy pregnant women that have correlated to risky pregnancy. The development of the fetus requires a healthy placenta which can be affected by a multitude of reasons such as stress, socioeconomic status, race, and overall health. This project aimed at analyzing how the microbiome of

a placenta affects the health of the baby during and after birth, what disease may be caused by lack of proper nutrients, and how could we potentially screen pregnant women to determine what type of bacteria they may have? We conducted a Pubmed review to select studies for meta-analysis to address these questions. Results are expected to reveal the connection between maternal microbial profile, specific microbial strains and diseases in the mother and fetus. This analysis will be enlightening to discover treatments, testing, and prevention methods for pre-term maternal infections.

South Florida State College

A Novel Multi-Epitope Vaccine against Clostridioides difficile surface proteins

Adrit Roy

Dr. Xingmin Sun

Clostridioides difficile is a gram positive, spore-forming, obligatory anaerobic bacteria that causes diarrhea and colitis within infected individuals. One of the major problems with C. difficile infections (CDI) is the high rates of recurrences, which are mainly caused by persistent C. difficile colonization. Vaccination for prevention of CDI could be cost-effective over a range of C. difficile risk. However, there is no commercialized vaccine available. Various cell wall binding protein Cwp2 [2] and Cwp84 [3]; spore proteins CotA [4] were reported to be immunogenic and confer protectiveness against C. difficile infection. The goal of this project is to develop epitope-based vaccines targeting C. difficile colonization. A multi-epitope novel vaccine was generated by integrating potential epitopes from the C. difficile surface proteins by immunoinformatic approach. Both T cell and B cell epitopes were screened and 3 Cytotoxic T Lymphocytes (CTL) epitopes, 3 Helper T Lymphocytes (HTL) epitopes, and 4 B-Cell epitopes were finally selected. These epitopes were linked together with linkers and a peptide adjuvant was added to the final fusion vaccine. Structural modelling and refinement helped to develop a stable structure of the chimeric protein. The refined structure of the fusion protein was used for molecular docking with immune cell receptors including Toll-like receptors (TLRs), Major histocompatibility complexes (MHCs), and B-cell receptors (BCRs) to ensure interaction and stability to elicit immune response. Further studies will be conducted in-vivo to establish its efficacy in the host.

University of South Florida

Modulation of Actin Filament Assembly and Mechanics with Gold Nanoparticles

Ahad Ansari

Dr. Ellen Kang

Actin is an essential protein that plays a vital role in the structural integrity of the cytoskeleton and many important cell processes. Gold nanoparticles have been used in cancer treatment as well as many different drug delivery mechanisms, however, their cytotoxic effects may hinder the integrity of actin filaments. The interaction between actin and nanoparticles has not been well established. In this study, we investigate how bovine serum albumin coated gold nanoparticles can modulate actin filament assembly and mechanical properties using Total Internal Reflection Fluorescence (TIRF) microscopy. By obtaining images at specific time increments, the actin filaments were analyzed using the Persistence Software to determine a numerical bending persistence length (L_p), as well as the end-to-end filament contour length. Our results can provide insights into the mechanisms occurring between actin and nanoparticles and further applications of gold nanoparticles in the cell.

University of Central Florida

Isolation, Cultivation, and Genomic Characterization of Marine Malassezia from Chondrilla nucula in Tampa Bay

Aidan Elliot

Dr. Haydn Rubelmann

In the marine environment, sea sponges are often seen as ideal symbiotes for microbial communities. Their filter feeder nature provides perfect internal environments for microbial growth. A 2023 study conducted by Sofia Carranza and Haydn Rubelmann sought to characterize the microbiome of Chondrilla nucula, a sponge native to Tampa Bay, via culturing techniques and next-generation sequencing (NGS). The results of the study showcased the species Malassezia dominating the fungal microbiome, implying this species may have a major effect on the microbial diversity within the sponge. Malassezia is a genus of fungus associated with skin diseases in mammals. However, many studies have shown an abundance of Malassezia species within the microbiome of sponges and other marine invertebrates. Despite this, little is known about Malassezia's role within the sponge and marine environment. This experiment intends to isolate and identify a species of Malassezia found in abundance within the marine sponge Chondrilla nucula. Microbial cryostocks were made from 17 sponge slurries and 6 water column samples.

Thus far, 2 sponge slurries have been grown using a combination of spread and streak plating techniques on CHROMagar plates, an anti-bacterial medium designed for cultivating and identifying Malassezia. This yielded 5 isolates with 3 distinct morphotypes. These isolates will be identified through first-generation sequencing (FGS) and cryostocked for storage. Malassezia isolates will then be sent to CD Genomics and undergo whole-genome sequencing (WGS) via hybrid Nanopore/ Illumina WGS. This experiment will result in the first Malassezia strains to be isolated and sequenced from the marine environment.

University of Tampa

Does neural activation differ between logical and non-logical individuals when identifying fake news, and which group demonstrates greater accuracy?

Ailliy A Garcia

Dr. Nichole Lighthall

The Cognitive Reflection Test (CRT) assesses an individual's ability to override intuitive, non-logical responses in favor of reflective, logical ones. Previous research has suggested that CRT can predict performance on biased cognitive tasks, with higher scores correlating to a lower likelihood of accepting non-logical outcomes. In other words, the less logically one thinks, the more likely they are to accept non-logical consequences. However, the underlying mechanisms driving this relationship remain unclear, leaving questions about cognitive abilities and thinking dispositions unanswered. This study seeks to address these gaps by investigating whether neural activation in the pre-frontal cortex differs between logical and non-logical thinkers when identifying fake news and which group demonstrates greater accuracy. Participants will complete the seven-item CRT, followed by a task in which they will determine the authenticity of news headlines. Neural activity will be analyzed using functional near-infrared spectroscopy (fNIRS), with data preprocessed and analyzed using statistical parametric mapping (SPM 2. Accuracy will be measured by calculating the percentage of correctly identified headlines per participant or hits as defined by signal detection theory. It is hypothesized that logical thinkers will show higher accuracy and greater neural activation during the task. While limitations such as the issue of numeracy and broader cognitive ability measures are anticipated, this study aims to narrow the existing gaps in the literature and enhance our understanding of how logical reasoning impacts decision-making when encountering misinformation.

University of Central Florida

Enhancing the Efficacy of Adoptive T Cell Therapy for Patients with Diffuse Large B-Cell Lymphoma by Ablating Galectin-3–Ligand Interactions

Aizada Berdalinova

Dr. Charles J. Dimitroff

Diffuse large B-cell lymphoma (DLBCL) is a major form of non-Hodgkin lymphoma that impacts over 10,000 individuals annually. This malignancy often relapses and is refractory to initial standard therapeutic approaches, underscoring the need to develop innovative therapies. Chimeric Antigen Receptor (CAR)-T cell therapy is a promising immunotherapy approach using patient T cells engineered to express CARs targeting cancer cell surface markers adoptively-transferred back into patients to elicit anti-tumor activity, but there is a need to develop a more effective CAR-T cell formulation with enhanced anti-tumor efficacy and in vivo persistence. Early data from our laboratory suggest that DLBCL patients exhibit heightened serum levels of galectin (Gal)-3 that could bind Gal-3 ligands on CAR-T cells, dampening functional activity and inducing cell death. We hypothesize that interference of Gal-3 binding to CAR-T cells could protect CAR-T cells from the immunodampening effects of Gal-3, thereby enhancing CAR-T cell therapy against DLBCL and improving outcomes. In this project, we will evaluate the effects of a novel orally-active Gal-3 inhibitor, GB1107, designed to block Gal-3 binding to its ligands on cell surfaces. We will conduct flow cytometry-based assays using GB1107, recombinant human Gal-3, annexin-V/ propidium iodide probes, and CAR-T cells to assess whether GB1107 blocks Gal-3 binding and protects CAR-T cells from Gal-3-mediated cell death. These findings will inform new therapeutic strategies targeting galectin overexpression in DLBCL and other cancers.

Florida International University

Evaluating the Healthiness of Lifestyle Features Among College Students: A Judgment Analysis

Akshitha Nimmagadda Sai

Dr. Jason Beckstead

People may think differently about what makes a healthy lifestyle. Relatedly, people may have

different standards about what makes a healthy lifestyle for men versus women. The purpose of this study is to assess the subjective weights assigned to various cues, or lifestyle features (Exercise, Vaping, Eating a Vegetarian Diet, Gender) as student participants form judgments of the healthiness of hypothetical students. The secondary purpose is to determine the extent to which the gender of the hypothetical student influences judgments of healthiness. A questionnaire included 16 hypothetical profiles (2x2x2x2 factorial design) and participants were asked to rate each profile on a scale from -10 (extremely unhealthy) to +10 (extremely healthy). The SONA system was used to recruit participants, 56 completed the judgment task. SPSS was used to determine the correlation between each of the cues and judgements of health. These correlations indicate the strength of each cue's influence, and were cluster analyzed to explore subgroups who used the cues differently. Analysis revealed that the Exercise and Vaping cues received the most weight when participants judged the health of the hypothetical students. The Gender cue showed a small and positive average correlation, indicating a slight bias towards considering females as more healthy than their male counterparts. Cluster analysis revealed that most participants perceived a Vegetarian Diet as healthy, but a small minority perceived a Vegetarian Diet as unhealthy relative to a Typical American Diet. Future studies building on these findings could examine how medical students and physicians make similar judgements.

University of South Florida

Investigating the bi-directional relationship between "high" vs. "low" church experiences and self-transcendent positive emotions

Alanna Allion & Sabrina A. Barella

Dr. Erin C. Westgate

There is a robust link between religious experiences and self-transcendent positive emotions (STPEs). But which religious experiences and which STPEs? These experiments probe the link between religious experience and STPEs by examining two disparate worship styles within Christianity—high church (traditional, ritualistic) versus low church (contemporary, spontaneous) contexts—and their unique relations to three STPEs: awe, gratitude, and elevation. We hypothesize that awe will be positively associated with high church contexts and gratitude will be positively associated with low church contexts, using elevation as a comparison condition. Study 1 investigated the causal direction of religion on STPEs through a field experiment. Ninety-two Christians participated in matched high/low church services and then journaled on 6 religious prompts. These qualitative responses are being analyzed using the LIWC STPE dictionary. Examining the opposite relationship, Study 2 uses an online experiment to investigate how STPEs influence worship preferences. We hypothesize that awe will lead to preference for high church contexts, gratitude will lead to preference for low church contexts, and elevation will lead to no preference. 432 Christians will be assigned to experience awe, gratitude, or elevation then rate 47 standardized church interior images on a 7-point scale based on preference. A mixed-effects model will analyze STPE effects on preference, using averaged ratings from a separate Christian sample to determine a consensus on church lowness/highness. This research aims to enhance Existential Psychology's understanding of the relationship between socioecologies and STPEs, illuminating the importance of considering the specific forms of these variables when studying religion.

University of Florida

Investigating Plasmid Diversity in the Bacterial Plant Pathogen Xanthomonas perforans

Albert Sunny

Dr. Erica Goss

Plasmids play a key role in horizontal gene transfer, significantly contributing to bacterial evolution by facilitating transfer of genes related to pathogenicity, antibiotic resistance, and other adaptive traits. This study focuses on understanding the role of plasmids in the evolutionary diversification of Xanthomonas perforans, a devastating plant pathogen causing bacterial spot disease in tomato and pepper. Our in silico-based plasmid prediction using the MOB-suite tool revealed the presence of diverse plasmids ranging from ~15 kb to ~235 kb across different phylogenetic groups defined by chromosomal genes. A network approach based on shared k-mers content was implemented, uncovering distinct plasmid cliques. Interestingly, these plasmid cliques were confined to specific phylogenetic groups suggesting potential incompatibility or restricted plasmid movement between groups. Furthermore, some of these predicted plasmids cliques were found to carry virulence genes coding for type III effectors (T3Es), including transcriptional activator-like effectors (TALEs), and genes related to biocide resistance such as copper. Overall, these results provide

foundational insights into plasmid diversity in Xanthomonas perforans with further implications for studying the role of these mobile genetic elements in genome dynamics, their persistence and adaptation.

University of Florida

Prevalence and Identification of Microplastics in the Lungs

Alberto Chaves

Dmitry Voronin

The pervasiveness of microplastics (MPs) in biological systems, specifically in humans, has raised questions about their possible negative health effects on humans. This study aims to determine the prevalence and type of MPs in Bronchoalveolar lavage fluid (BALF) and any potential correlations with respiratory illnesses. BALF samples were collected, digested, and processed through vacuum filtration to isolate the MP particles. Using optical microscopy, the particles were located and classified by color and morphology. Raman spectroscopy was used for definitive classification as MPs through their spectra. Preliminary findings include Raman spectra and optical photographs of many MPs from various patient samples. The spectra have also been processed for background interference. By employing Raman spectroscopy and optical microscopy this research provides critical insights into the potential effects of MPs in respiratory pathology and contributes to understanding their broader implications on human health.

University of South Florida

Lane Detection in Self-Driving Cars: A Neural Network Approach to Accuracy and Speed

Aldridge Kalenga & Buchizya Mwase

Juan Calderon

This study explores the use of Artificial Neural Networks (ANNs) to enhance lane detection systems in self-driving cars. By training the network on a comprehensive dataset that incorporates diverse road scenarios, including varying lighting conditions and road markings, the research aims to advance the vehicle's perception capabilities. Extensive testing highlights the model's strong performance in real-world conditions, underscoring its potential to drive progress in autonomous driving technology.

Departing from traditional pixel-based segmentation methods, this innovative approach reimagines lane detection by treating it as an anchor-driven ordinal classification task inspired by human visual perception. By leveraging global features and a sparse row-anchor-driven representation, the method effectively mitigates challenges related to efficiency and localization errors.

The results demonstrate state-of-the-art performance in both speed and accuracy, offering a highly efficient and reliable solution for lane detection across a wide range of real-world scenarios. This work represents a significant step forward in developing robust, real-time perception systems for autonomous vehicles

Bethune-Cookman University

Impact of STAT3 Inhibition on Tumour Progression and Immune Evasion in Non-Small Cell Lung Cancer

Alejandra P. Santos Ginorio

Dr. Hector Gomez

Signal Transducer and Activator of Transcription 3 (STAT3) is a critical transcription factor that regulates cell growth, survival and immune responses. It is implicated in Non-Small Cell Lung Cancer (NSCLC), the most prevalent form of lung cancer categorized by aggressive tumour progression and high metastatic potential. NSCLC's aggressiveness stems from the overactivation of STAT3, promoting cancer cell proliferation, survival, and invasion through mechanisms including genetic mutations, cytokine signalling and inflammatory pathways within the tumour microenvironment. This heightened STAT3 activity not only supports tumour growth but also suppresses anti-tumour immune responses and fosters an immunosuppressive environment. Currently, treatment for NSCLC patients involves cancer therapies that reduce tumour cell proliferation. This study investigates the impact of STAT3 inhibition in NSCLC that suppresses the anti-tumour immunity and epithelial-mesenchymal transition in the cancer cells. This article utilizes the PubMed database to retrieve a total of twenty articles regarding the effects of STAT3 on cell growth and metastasis, specific STAT3 inhibitors such as W2014-S, IL-37, MicroRNA-148a, RITA and WP1066, and investigating their effects on NSCLC. Inhibiting STAT3 reduces tumour cell proliferation while enhancing T-cell activation and reducing immunosuppressive factors within the tumour microenvironment. Some studies observed the role of STAT3 inhibitors with both in vitro and in vivo samples, highlighting the therapeutic potential. STAT3 clearly has a crucial role in aggressive

pathogenesis seen in NSCLC due to increased immune evasion; thus, the inhibition would help reduce the tumour invasiveness, offering a promising therapeutic approach to mitigate NSCLC progression and enhancing the efficacy of existing treatments.

University of South Florida

Towards a curated psychological research database of object and animal images created by generative artificial intelligence

Alejandro Ibarra

Dr. George Buzzell

Visual stimuli represent a crucial component of experimental paradigms designed to understand the human mind and brain. Image databases, commonly derived from real-world photographs, are widely used in psychological studies. Images in these databases are typically standardized through participant ratings along dimensions such as valence and arousal. However, most existing image databases are limited in terms of image quality, resolution, variety, and sample size. These limitations restrict the scope of research they can be used for. Recent advances in generative artificial intelligence (AI) models have enabled the rapid creation of large, diverse, and highly-detailed images that can overcome the challenges of traditional image databases. However, intermediate steps are required to ensure quality control, as well as to acquire normative ratings from human observers. To these ends, this study introduces an AI-generated image database of objects and animals that was rated by human participants across four dimensions: animacy, familiarity, valence, and arousal. The database includes over 800 diverse animal and object images, curated by psychological researchers to ensure each image meets standards for image content, composure, size, and resolution. A total of 80 participants rated the images, with each image receiving 20 individual ratings. Exemplar images and normative ratings across the four examined dimensions will be presented. Potential use cases will be discussed. Collectively, these data demonstrate the potential of generative AI models for creating scalable and high-quality stimuli for a wide range of psychological research experiments.

Florida International University

Social Comparison Targets and Topics: Domains of Upward and Downward Comparison Across Social Media Platforms

Aleksandra Masiulis

Benjamin Johnson

Social media provide countless opportunities for individuals to compare themselves to other users. A large body of research into social media-induced social comparison has largely focused on the negative impacts of comparisons, especially with regard to young adults, identity development, or fear of missing out (FOMO). There is less research into the mix of positive and negative effects that come from social media-induced social comparison, and even less investigation into the facets that people compare on, from appearance to conspicuous consumption to social activities. These facets of comparison are nuanced and are likely to differ between platforms. To that end, we conduct a study of N =165 American adults to examine their social comparison activities on three distinct and popular social media platforms: Facebook, Instagram, and LinkedIn. Our study design maximizes realism by having participants first answer questions about their usual social media use and newsfeed, then browse their social media during the study and report back their experiences and feelings. The results suggest that SNS users typically post about their personal life and work, which then become the basis of comparison for most of their peers. A difference in frequency and intensity of upward social comparison between LinkedIn and Facebook may also imply that apparent professional success is the most highly valued aspect of users' online image. Future research could focus on whether professional social comparison is also the most compared facet offline, or to what extent professional success affects self-esteem.

University of Florida

Examining the Correlation Between Swimming Force, Lower-Body Strength, and Power Metrics in Collegiate Swimmers

Alessia Claassen & Claudia Ashford

Konar Smith

This research explores the correlation between the force production in swimming, measured with a Destro machine, a land-based tethered system, and other power metrics, such as one rep max squat and vertical jump height. The Destro Machine is a system that allows swimmers to push off the

wall with different amounts of resistance. The hypothesis is that swimmers with greater lower-body strength and power measures will achieve higher maximum loads on the Destro machine due to the biomechanical similarities in power generation between swimming push-offs and land-based movements. Exploring this relationship could provide valuable insights into how dryland training contributes to swimming-specific strength and performance. The amount of resistance where swimmers fail to get off the wall is the peak of force generated in the water. The results from the peak force generation in the water is then compared to the 1RM max squat, an indication of lower-body strength, and the vertical jump test, indicating lower body explosive power of the participant. Participants will perform trials with various amounts of resistance, which is increased up to 300. The study will include collegiate swimmers aged 18–25 with at least one full year of competitive experience and familiarity with dryland strength training, while excluding those with recent injuries, lack of strength training experience, or ongoing rehabilitation.

St. Thomas University

The impact of academic entitlement, including EXTERNALIZED RESPONSIBILITY and ENTITLED EXPECTATIONS, on a college student's academic success.

Alessia Zedde

Dr. Patrick Cooper

Academic entitlement is characterized by students' belief that they deserve favorable treatment in academic settings, often without regard to their effort or engagement. This entitlement often manifests in two ways: Externalizing Responsibility (ER), where students deflect accountability for their academic success onto others, and Entitled Expectations (EE), where students expect special accommodations from instructors. This study explores two psychological constructs, ER and EE, and the association with college students' academic outcomes.

A sample of 251 college students completed the academic entitlement scale (AES), which included 15-items examining ER (10-items) and EE (five-items). Three academic outcomes were measured: (1) course failures (Fs), (2) course withdrawals (Ws) and (3) academic self-efficacy, as measured by the Educational Self-Efficacy Scale (5-items). It was hypothesized that students with higher ER and EE scores would have more Fs and Ws as well as a strong negative correlation between ER and EE and an individual's academic self-efficacy.

Correlation analysis suggests that ER is moderately positively associated with Ws, but not Fs. EE was not associated with Ws or Fs. Both ER and EE were negatively correlated with academic self-efficacy.

These results support the hypothesis that students who rely on external support from others may lack the confidence derived from their own academic responsibility. Such insights emphasize the need for educational programs that promote self-efficacy and personal accountability, potentially reducing reliance on external supports and encouraging resilience in academic pursuits. This study highlights the importance of fostering academic accountability and self-efficacy to reduce maladaptive academic behaviors.

Lynn University

Tsallis Entrophy and Seismic Events: An Examination of Chile's Earthquakes Activity

Alex Vazquez

R. A Martinez Celorio

In concrete, we analyze the earthquakes that occurred in Iquique, Chile from 2007 to 2014 to explore in concrete the earthquakes of 8.1 magnitude that took place in early 2014. Using these phenomena as an axis point, we study the frequency throughout different software such as MATLAB to obtain a program capable of measuring the frequency and mutability of the dataset. This Database was acquired from the USGS and IPOC respectively and later compared to use the most accurate dataset to study. Finally, the study concludes with the analysis and comparison of the Tsallis entropy throughout the events and his consequent mutability. The study is made in order to compare the relations between this factor and its relative coincide in the result, presenting with that, a new procedure to determine with cancelation the occurrence of those massive earthquakes

Miami Dade College

The State of Investing

Alexander Aranda

Eric Levy

Amid continuing economic volatility, according to the Aspen Institute, 44 percent of American workers are earning a median hourly wage of $10.22. What are they going to do with that money is the next question. The theme of this research is to understand individuals' investment strategies. To this end, a 15 question survey was administered using Amazon turk to individuals 18 and older

across the United States. The survey examined 150 respondents from a variety of backgrounds, income levels, gender, political party, education levels and age range. I tested two hypotheses. First, is there a significant difference between gender and investment strategy; and second, is there a significant difference between gender and obtaining a retirement account. I used IBM SPSS to analyze the data and found that there is a statistical significant difference in both hypotheses at the one percent level. I found that women are more risk averse, while men tend to be willing to take on more risky investments. For example, 33% of men said they would invest in crypto currency while only 10% of women would invest in this type of investment. Another key finding was that men seem to have a more proactive stance obtaining a retirement account compared to women. Overall, the results of this research look to compare key differences with how men and women think about investing and their exposure to different risk levels.

Florida Atlantic University

Data-Driven Patient Allocation Optimization with Epidemic and Vaccine Modeling

Alexander DeLise

Dr. Arda Vanli

Pandemics strain healthcare systems worldwide, creating urgent challenges in allocating limited resources like hospital beds while controlling disease spread. Effective patient allocation during such crises is critical to minimizing unmet healthcare demand and ensuring equitable healthcare access across regions. This study addresses these issues by developing a mixed-integer nonlinear mathematical model that integrates the Susceptible-Infected-Recovered-Vaccinated epidemic framework with a patient transfer and allocation framework to improve patient distribution during outbreaks. Our approach also factors additional disease transmissions caused by the assignment of patients to different regions into both the mathematical model and the epidemic framework. The model minimizes unmet demand for hospital beds while limiting patient transfers between regions, incorporating healthcare capacities, spatial constraints, and dynamic disease transmission effects. By leveraging real-world data from all Florida counties during the COVID-19 pandemic, the model simulates patient allocation while accounting for disease-spread dynamics influenced by resource constraints and patient transfers. We observe total unmet demand for hospital beds diminish after pandemic infections peak and fewer total patient transfers across all decision periods. This research demonstrates the potential to significantly enhance pandemic response strategies. The model provides policymakers and healthcare administrators with a robust, data-driven tool to make informed decisions, reducing strain on overburdened facilities and improving patient outcomes during pandemic scenarios.

Florida State University

Does the Order Of Questionnaire Administration Affect the Covariance of Socioeconomic Indicators

Alexandra Gilmore

Chris Martin

The order in which questionnaires are administered seems to alter responses across various domains. Previous literature has shown that interest levels in politics is increased when participants are first queried about salient topics (McFarland, 1981), and people are less likely to report on socially undesirable behavior after being asked to report their levels of disapproval for such behavior (Standing et al, 2010) or their religiosity (Rodriguez, 2014). Perhaps less obviously, the ordering of questionnaires measuring similar constructs can change the relationship between those two constructs. For example, Lee et al. (2016) asked participants to report on their life satisfaction and their health, randomizing which questionnaire appeared first. When participants answered health questions before life satisfaction questions, the correlation between health and life satisfaction was doubled. The current study extends this investigation to subjective social status (SSS) and objective measures of socioeconomic status (SES) in 2,280 young adults recruited via social media to complete a survey online. Participants completed the MacArthur Scale of Subjective Social Status which asks them to rank themselves on a scale of 1-10 compared to other people in the United States and also reported on objective SES measures including family income, monthly expenditures, education, and healthcare quality. Participants were randomized to complete either SES measures or the SSS question first. Surprisingly, there was no significant interaction between order of questionnaire administration and any of the objective SES variables in predicting SSS, indicating that no ordering effects are present. Relevant sociodemographic moderators will be examined.

Florida State University

Reshaping Labor Advocacy: The OCAW, Global Alliances, and Environmental Justice in the BASF Lockout

Alexis Persbacker

Dr Robert Cassanello

This project, part of an Honors Undergraduate Thesis under the advisement of Dr Robert Cassanello, examines how globalization influenced the bargaining strategies of the Oil, Chemical, and Atomic Workers (OCAW) union during the BASF lockout in Geismar, Louisiana. It highlights how the union mobilized international alliances, including the International Federation of Chemical, Energy and General Workers Unions (ICEF) and the German chemical workers union IG Chemie, to address occupational health, environmental violations, and corporate accountability on a global scale. The study builds on existing literature on labor-environmental alliances and global labor struggles, using a Gramscian-regulationist framework to analyze how OCAW united diverse stakeholders. By linking workplace safety to community health, the union embedded environmental concerns into labor advocacy, offering a model for transnational collaboration. The research is set to employ archival and secondary source analysis to explore the material and ideological dimensions of OCAW's coalition-building strategies. It investigates how the union overcame globalization's logistical and power imbalances to amplify its demands through cross-border solidarity. The findings are expected to reveal how these coalitions reshaped industrial-pollution debates, transformed worker consciousness, and strengthened labor movements globally. This case demonstrates globalization's dual role as both a challenge and a resource for advancing collective labor and environmental justice. By providing a historical and sociological framework for transnational activism, this research contributes to understanding how unions can navigate corporate power and foster transformative change in an interconnected world.

University of Central Florida

Novice Weightlifters Bench Press Performance During Visual Occlusion and Social Facilitation

Alexis Smith & Ian Jimenez

Jason Kostrna

Proprioception is a sensory ability that allows individuals to become aware of their body's movements without visual input. When integrating visual cues, proprioception uses information from past experiences to inform predictions about the characteristics of a given object. In unfamiliar circumstances, these estimations can be inaccurate and enable manipulation of resistance to influence exerciser's perceptions, beliefs, and performance. Furthermore, during sensory incongruence it is hypothesized that mediators such as social facilitation are intensified. A total of 36 novice weightlifters (individuals who have not lifted more than twice a week for the past three months) from 18 to 50 years old will be recruited and complete three exercise sessions over the course of three weeks. During the first session, researchers will determine participants' 10 repetition-maximum (10-RM) on bench press. During the second and third session, participants will perform a bench press task until failure under three randomly ordered conditions: visually unoccluded (10-RM weight), visually occluded (10-RM weight), and visually occluded with an additional five percent weight above their 10-RM. In addition, the two experimental sessions will be randomly assigned to either include social facilitation during lifts or not. Between each exercise set, participants will report their motivation, perceived exertion, arousal, and pleasantness. The three by two repeated-measures design will test the hypotheses that an individual's bench press performance and psychological response will improve when exposed to social facilitation, especially when the weight is visually occluded. Data collection is ongoing and (n =5), preliminary data will be presented.

Florida International University

Heart Rate Variability Differences Throughout the Menstrual Cycle

Alicia M Kralik & Delaney McDermott

Dr. Hansen Mansy

Understanding the impacts of the menstrual cycle on heart rate variability (HRV) is important for improving HRV assessment of female cardiovascular and autonomic nervous system health. Although HRV studies have been extensive, many studies focus on male participants, limiting the applicability of this research to menstruating females. This study aims to understand sex-based differences and how these differences might be correlated to hormonal differences due to the female menstrual cycle. This preliminary study recorded four 25-minute ECG data from 13 male and 9 female participants correlating to the different phases of the menstrual cycle. For comparison, male participants were given a start date, and recording days were completed within the same interval based on the female menstrual cycle. The goal is to analyze the relationship between fluctuating hormone levels and HRV

analysis, including frequency domain, time domain, and non-linear features of HRV. Anticipated findings could include a phase-specific association between different stages of the menstrual cycle and some HRV features. This study could also provide valuable information into the physiological changes that occur in females compared to males who do not have a menstrual cycle. These findings could give clinicians and researchers insights into tailoring treatment plans and future research to female-specific physiological changes and improve healthcare outcomes for menstruating patients.

University of Central Florida

Commuting with Your Blood Pressure

Alicia Reynolds

Dr. Amy Bohan

High blood pressure, also known as hypertension, is an unknown poison that affects many individuals. Many factors can contribute to extensive blood pressure, including an overlooked yet frustrating daily component of life: traffic. To investigate, blood pressure readings from 310 participants of varying ages and genders were checked upon exiting congested and light traffic. Individuals who drove in congestion had higher blood pressure readings than their lighter traffic counterparts and displayed a +19 mm Hg in systolic and +9 mm Hg in diastolic blood pressure. This is very worrying because, after a prolonged period, one may develop hypertensive disorders simply by an act of transportation. As the world becomes increasingly populated, so will the roads and the number of vehicles. So, if areas of highly dense populated people incorporated more promising systems for conveyance, individuals wouldn't have the stress of commutes, traffic, and their health. Overall, congestion on the road and blood pressure are distinctly correlated and significant to comprehend.

New College of Florida

A Survival Horror Video Game's Impact on Visual Attention

Alicia Sprague

Dr. Raymonde Neal

Acknowledging that video games have recently become a popular media choice among the greater population, it is important to consider the psychological implications that this media may have on individuals, whether positive, negative, or neutral. Specifically, the psychological concepts of visual attention and anxiety levels are of interest in the current research. The main research question is whether playing a survival horror video game will increase the visual selective attention of the player. This study will examine how visual attention and anxiety levels differ after playing a survival horror video game and whether an individual's gaming preferences affect these concepts. The research consists of the preliminary evaluation of participants' visual attention abilities and anxiety levels through psychological tasks. They will then play Resident Evil 4: Chainsaw Demo, the selected survival horror video game for this study. After playing the demo, participants will repeat the previous psychological tasks, and their results will be compared. It is expected that a player's visual attention and anxiety levels will increase after playing a survival horror video game, and a player's experience with similar video game genres may affect their scores in the above categories. For those who struggle with the cognitive function of visual attention, video games could be implemented in a psychological or educational sphere to improve the functioning of the affected individuals in a creative and appealing way. Findings could benefit a diverse age range of older and younger populations in improving visual attention.

University of Central Florida

Striae in Cushing's Disease: Exploring Glucocorticoid Pathways and Therapeutic Targets

Alina Jacob

Dr. Hector Gomez

The cutaneous manifestations associated with Cushing's disease, particularly the hallmark feature of purple striae, are well-documented, yet the underlying mechanisms driving their formation are not fully understood. This study investigates the pathways contributing to striae development in Cushing's disease, with a focus on identifying potential therapeutic targets for symptom management. Research was conducted in two parts: (1) a review of clinical and diagnostic aspects of striae using keywords such as "cutaneous manifestations of Cushing's disease" and "diagnosis of striae with elevated cortisol," yielding 120 articles, of which 30 met inclusion criteria; and (2) an analysis of molecular pathways, including cortisol's effects on collagen and elastin, using search terms like "glucocorticoid receptor signaling" and "collagen degradation pathways," yielding 45 articles, of which 11 were included. Findings suggest that chronic activation of the glucocorticoid receptor (GR) by elevated cortisol disrupts fibroblast activity, impairs collagen and

elastin synthesis, and contributes to skin thinning, fragility, and the development of purple striae. Specifically, GR-regulated genes such as FKBP5, COL1A1, and TGF-ß signaling pathways seem to play critical roles in these processes by altering extracellular matrix remodeling and weakening skin structure.

This review highlights glucocorticoid receptor pathways as potential therapeutic targets, emphasizing the need for further research to confirm these mechanisms and explore interventions aimed at improving skin health and quality of life in individuals with Cushing's disease.

University of South Florida

Neuromarketing: Understanding College Student Perceptions of Tobacco Policies on Campus

Allha Akrami & Vishal Patel

Dr. Claudia Parvanta

The use of e-cigarettes, also known as vaping, has become increasingly more prevalent among young adults. The main concern of vaping products is nicotine, a highly addictive substance that causes harm to brain development and worsening symptoms of depression and anxiety. Tobacco-free campus policies have been recommended and supported as ways to decrease tobacco and nicotine use; however, gaps still remain in the understanding of how college students perceive how vaping relates to these policies and its messaging. The aim of the study is to understand how college students interpret and respond to campus anti-tobacco policy and its messaging. Participants were exposed to various forms of health communications material including campus anti-tobacco policy language, enforcement, and communication vehicles (particularly related to campus signage), social media posts generated by campus stakeholders, and websites offering cessation resources. Their eye movement across the communication material was tracked using a 30Hz eye-tracking sensor, their facial expressions were recorded with a webcam and analyzed with facial expression software, and survey data was collected using closed- and open-ended questions. Neuromarketing metrics combined with survey results and open-ended questions provided insight into students' perceptions and responses. Participants responded best to signage with positive messaging and use of words like 'pride'. Through the various communication materials, the most effective messaging was positive reinforcement in the anti-tobacco policies and informative messages. These findings indicate that message campaigns around anti-tobacco campus policies should use positive reinforcement to inform people about these policies and to quit vaping.

University of South Florida

Thin for the Win: Effects of Appearance-Related Media on Body Image Perception

Allison Perez

Dr. Jesse Cougle

In recent years, TikTok has become an incredibly popular app where the continuous viewing of triggering content has spread, often leaving women to feel insecure about themselves after a prolonged amount of exposure to certain types of content. This study aimed to investigate the emotional and cognitive effects of exposure to thinspiration videos on the body image of young adult women. With a quasi-experimental design, female undergraduate students attending Florida State University were asked to view two video compilations – one featuring triggering body image content and the other animal videos – and then tasked with answering various questions that assess their negative mood and body image concerns. We hypothesized that exposure to thinspiration content would result in heightened appearance concerns, greater appearance importance, and greater negative mood when compared to the control condition. We found that following the body image video, participants reported greater social comparison, appearance concerns, appearance importance, and negative mood. This research adds to the existing literature on social media's effect on body image perception by focusing on TikTok, an app whose popularity has only recently grown and thus is not as studied when compared to other platforms. In addition, our study provides parents, educators, and mental health professionals with insight into the harm that may arise from social media usage.

Florida State University

Forked Roads: Making A Webcomic

Alyna Santos Bodart

Professor Kevin Curry

My Project, "Forked Roads: Making A Webcomic" centers on the research and creation of my original webcomic about teenage nekomata, or shapeshifting cat yokai from Japanese folklore.

The project focuses on a 15-year-old introverted nekomata who struggles to get used to her

chaotic new roommates, who are also nekomata; the project's themes include neurodivergence, loneliness, social awkwardness/isolation, relationships, multiculturalism, humanity vs. instinct, folklore, and shapeshifting.

My process included performing research on folklore about the nekomata from Japanese folklore as well as webcomic conventions, then writing the script. Utilizing Procreate on my iPad, I then sketched out the layout of all 21 pages of the first episode of the comic. After the sketching phase, I proceeded to create character and set design. After that, I completed the inking using the sketches as a guide. I finished off the art with coloring and shading and added the dialogue to finish.

My project resulted in the completion of the first episode of my webcomic, "Forked Roads," complete with color and line art.

I conclude that the project will add to the fast-growing world of webcomics; it also utilizes obscure folklore from the Edo Period about the nekomata while also diving into themes of neurodivergence, loneliness, and the pressure to conform to a world that does not accept the characters' differences. The project will teach the audience about this folklore while also giving social commentary about modern relationships and how we present ourselves both in society and our close relationships.

Florida State University

Long-term Neurobehavioral Impact of Prenatal Oxycodone Exposure

Alyssa Green

Dr. Surya Pandey

The opioid epidemic is a critical public health crisis, with opioid misuse contributing to 75% of overdose deaths in the U.S. annually. Pregnant women who use opioids face significant risks, while their offspring frequently experience neonatal abstinence syndrome (NAS) and long-term behavioral and neurobiological deficits. However, the mechanisms driving these lasting effects remain poorly understood. This study explores how prenatal oxycodone exposure affects adult behavior and brain connectivity, focusing on the orbitofrontal cortex (OFC) and its interaction with the basolateral amygdala (BLA). Using a mouse model, pregnant C57BL6/J females were exposed to oxycodone or saline throughout gestation. Male offspring exposed to oxycodone exhibited impulsive-like behavior and increased reward sensitivity, as revealed by behavioral assays. Disrupted BLA-OFC connectivity was identified through virus-based tracing experiments. Furthermore, to investigate causality, we utilized DREADD-based chemogenetics to manipulate BLA-OFC activity and employed calcium imaging to measure OFC dynamics. Preliminary findings indicate hyperconnectivity within the BLA-OFC pathway and altered OFC activity, correlating with the observed behavioral dysfunction in male mice.. These findings provide critical insights into the neural mechanisms underlying cognitive and emotional regulation deficits in offspring exposed to prenatal oxycodone. By identifying affected pathways, this work lays the foundation for targeted interventions and informs strategies to mitigate the impact of the opioid epidemic.

Florida Atlantic University

Long-Term Impacts of Hunting on Frugivore Community Recovery in the Ecuadorian Amazon

Alyssa Michelle Cabrera

Dr. Bette Loiselle

Tropical forests are heavily exploited via anthropogenic activities, like hunting, which disproportionately impacts larger-bodied wildlife because they reproduce slowly and are targeted for bushmeat, while smaller-bodied species (e.g. rodents) benefit from this decrease in competitors and predators. The resulting shift in faunal communities, termed 'defaunation', has been a topic of concern because it affects key interactions, like animal-mediated seed dispersal and rodent-driven seed predation. Although defaunation has been documented in tropical forests globally, the ability of faunal communities to recover after hunting-induced defaunation has not been widely evaluated. This is particularly relevant now given that some rural communities in the last decade have begun to decrease their hunting activity due to rapidly evolving socioeconomic situations. To address this, we compared the wildlife communities in an unprotected, previously defaunated site and in a protected, never defaunated site and evaluated if wildlife communities have recovered since an initial study 15 years ago, which found the non-protected site was negatively impacted by hunting relative to the protected site. We used camera traps to evaluate the functional and species-level diversity, composition, and mean body mass of terrestrial wildlife and trail surveys to focus on avian and arboreal frugivore communities known to be impacted by hunting and critical for forest regeneration. Surprisingly, preliminary results

indicate no differences in community composition between the two sites. These results may indicate some level of faunal recovery in recent years and highlight the need for ongoing and long-term wildlife monitoring to understand the trajectory of current global change patterns.

University of Florida

Investigating External Factors Influence on STEM Students' Relationship with their Major and Future Profession

Amanda Lindquist

Dr. Nicole Lapeyrouse

As shown by research, students who develop a strong connection to their profession are more likely to stay within their field. However, there is a high attrition rate for post-secondary STEM (Science, Technology, Engineering, and Math) students. There is a high national demand for students to not only choose a STEM major but also to graduate and enter the workforce to become professionals. This study explores a students' connection with their major and identity within their future profession. Students enrolled in post-secondary chemistry courses completed a questionnaire related to their STEM identity. The survey was administered to courses taught in the chemistry department at the beginning and end of the semester, and those willing to participate signed up for an online interview. The following presentation will focus on the responses from the zoom interviews that were recorded for transcription and coding purposes. The results for the interviews show that students have found advantages in that their major is preparing them for their future goals and are optimistic about future employment. However, some have voiced disadvantages, including employment concerns. Additionally, the resources and experiences students engage with, for example, clubs and internships, are impacting how they view themselves in their future careers. The results of this study will help understand factors that impact STEM undergraduates and find what affects their relationships with their majors.

University of Central Florida

Role of Deliberate Ignorance on Overestimation of Racial Equality

Amara Woodward

Trisha Dutta

The pervasiveness of racial inequality may be due to the misperception of many that racial inequality is a vestige of the past. It's not always clear if people's misperception about racial inequality is based on deliberate or unintentional ignorance, but regardless, ignorance of the oppression of a significant percentage of people in the United States presents a barrier to impactful progress toward eliminating racial inequality. In this study, we investigated whether participants would choose to remain ignorant or seek to inform themselves regarding potentially new information about race-related issues and how seeking such information would impact their misperception of racial inequality. In the study, participants were randomly assigned to either a race or non-race condition, where they had an opportunity to reflect and read on hypothetical scenarios and popular misconception about race-related or non-race related topics. We found deliberate ignorance to be positively associated with overestimating modern racial equality and information seeking was negatively associated with overestimating modern racial equality in the race-condition. Further, we found that condition significantly affected overestimation of racial equality; people in the race-condition were less likely to overestimate present-day racial equality than people in the non-race-condition. This study suggests that when misperceptions on racial inequality prevail, it seems to be caused more by deliberate rather than unintended ignorance, and when accurate information on racial issues was made available, and people were willing to engage with them, people were willing to learn and incorporate new information into their understanding of racial equality.

Florida State University

Exploring the Therapeutic Potential of Psilocybin: Insights from a Meta-Analytic Review

Amber Fazio

Dr. W. Steven Saunders

This research dives into the relationship between pre- and post-psilocybin study reports and the implications this has on depression symptomology. Psilocybin, which contains psychoactive properties found in specific mushrooms, also known as "magic mushrooms", has increasingly shown its potential therapeutic use and impacts on mental well-being. With Western society becoming more open to more novel therapeutic interventions, recent studies have investigated psilocybin regarding depression scores from a single dose.

Using a systematic literature review, pre-and post-treatment and paired sample studies from

2010 to the present about single-dose psilocybin's impact on depression symptomology scores were analyzed using quantitative analyses. With twelve studies fitting specified inclusion criteria, effect sizes for all studies were calculated, with all individual effect sizes showing a large decrease in depression symptomology scores, with the overall pooled effect size at 2.5 and the overall pooled effect size for Cohen's d at 1.7. With limitations present in this analysis including heterogeneity and variability between studies, further investigation is needed.

With statistical evidence that just a single dose of psilocybin has such a significant impact on depression symptomology, this provides a catalyst for future psilocybin treatments, with the potential to go beyond depression symptomology. Deepening the understanding of psilocybin's potential to lessen depression symptomology can provide insights into more holistic methods of mental health treatments that could benefit people as an alternative to current mental health practices. This meta-analysis highlights the need for more research on psilocybin treatments to address the limitations of this analysis.

University of Central Florida

Leveraging ChatGPT to Encourage Shared Decision Making and Trust Between Providers and Elderly Adults in Healthcare Settings

Amrutha Venkat & Rosalie Holderith

Dr. Ashleigh Bennett

With the recent advancements in artificial intelligence, AI tools like ChatGPT are having a widespread impact across disciplines, including healthcare. For older adults who often do not feel included in their health decisions, ChatGPT could be a resource to bridge knowledge gaps. A national survey with 398 respondents was conducted on SurveyMonkey including participants residing in the United States above the age of 18. Quantitative analysis showed 19% of total respondents were above the age of 60. 54% of participants over the age of 60 reported being familiar with ChatGPT prior to the survey. When asked on a Likert scale, 59% of elderly participants responded with "Strongly Agree," "Agree," or "Neutral" for the idea of using ChatGPT to make decisions about their health and 72% indicated trust in the information it provides. 36% of elderly respondents reported feeling more comfortable asking ChatGPT medical related questions than their own health care provider. Major themes that emerged from the inductive qualitative analysis of "What are some things that would stop you from using ChatGPT to help you make healthcare decisions," were lack of trust, unreliable information, and preferring in person provider interactions. These findings show that while elderly individuals show receptiveness to using ChatGPT to aid in healthcare, there are barriers to overcome. Using education and trust building measures to address these issues could permit ChatGPT to serve as a valuable tool for fostering shared decision-making in healthcare for elderly individuals, who are often portrayed as unwilling to engage with technological advancements.

Nova Southeastern University

Longitudinal Characterization of Resting State fMRI, DTI, and Action-place Spatial Learning in the TgF344-AD rat Reveals Impaired Action-place Learning Emerging at 5-months

Amy Le

Dr. Aaron Wilber

A hallmark of preclinical Alzheimer's Disease (AD) is spatial disorientation. One potential cause is disrupted exchange between egocentric and allocentric reference frames. Both the parietal (PC) and retrosplenial cortex (RSC) are known for roles in encoding and transforming information between these reference frames. We hypothesized that pathology development in TgF344-AD rats lead to brain network dysfunction, which causes impaired allocentric and egocentric coordination. In TgF344-AD rats and littermate controls, reference frame coordination was assessed at 3, 5, & 8.5 months with an action-oriented spatial navigation task. Rats were required to associate actions (e.g., left turn) with locations. Days to criterion, number correct, incorrect and no response, side bias, head scanning, and procedural errors were measured. Graph theory was applied to longitudinal MRI data acquired at 2, 4, 6, 10, 12, 16 & 18 months in vivo at 21.1T to assess functional and structural connectivity alterations by rsfMRI, and structural diffusion tensor imaging (DTI), respectively. We found that at 3-months, rats in both groups could not achieve criterion and declines in action-orientation performance emerged at 5-months of age. These alterations coincided with changes in the hippocampus and the entorhinal cortex of TgF344-AD rats, with a delay in changes in weighted degree to later in life than controls. The 5 months group made fewer correct choices and had more no response trials than littermate controls. These findings highlight a new focus for understanding cognitive deficits by using

allocentric and egocentric coordination as a novel predictor of early declines in Alzheimer's Disease.

Florida State University

Guided Universal Training for Semantic Segmentation (GUTSS)

Amy Wu

Dr. Jeremy A. Magruder Waisome

As artificial intelligence (AI) becomes more prevalent in educational settings, the need for instruction around AI skills will increase. Guided Universal Training for Semantic Segmentation (GUTSS) is a mobile application that enables students to develop image segmentation and manipulation skills while learning about small animal anatomy. To connect AI and sciences, in-service science teachers can use GUTSS inside and outside of the classroom to help students learn about small animal anatomy. Through the application, teachers can enrich their classroom curriculum with technology, share materials, grade assignments, and view their students' work. GUTSS uses open-set object detection, image segmentation, and image manipulation to assist users with organ identification. Gamification in the application will make learning animal anatomy more engaging to students.

Prior work indicates teachers' willingness to integrate AI concepts into classroom under state standards. Current work is supplementing anatomical image data sets with frames from online dissection videos and recorded videos and images collected from fundamental biology classrooms on cat and fetal pig dissections at University of Florida, Florida State University, and Lincoln University. Next steps involve segmenting and labelling the organs from these images. Future works involve feedback from anatomical experts. Ultimately, the application will be able to identify small animal organisms' anatomical features as a tool for students to learn.

University of Florida

Playing Stereoscopic Video Games Enhances the Precision But Not the Accuracy of Depth Perception

Anamaria Rey & Yingzi Luo

Roger Li

We recently reported that playing immersive video games in a three-dimensions (3D) environment boosts stereo vision in young adults with normal vision. Here we asked whether the improvement in stereoscopic acuity (precision) was the result of a reduced disparity pedestal, as indicated by a decreased subjective depth bias (accuracy). Twenty-one young university students with normal visual acuity and stereoacuity were recruited. All of them had limited previous video game experience, and none had ever played 3D video games. Participants were required to play stereoscopic 3D video games (first-person shooter action video games) for a total of 40 hours, 2 hours per session, over 4-5 weeks. Depth detection performance was measured using random dot stereograms before and after the video game intervention. Stereo acuity and bias (point of subjective equality) were defined as the disparity at the 84% (adjusted for zero bias, 1 standard deviation of response variability) and 50% correct response rates, respectively, obtained by fitting a Gaussian function. After playing 3D video games, there was a statistically significant difference in stereoacuity (improvement in mean stereoacuity, 32.9%; mean difference=10.87 arcsec; paired t=2.941, p=0.005), but not in stereo bias (mean difference=0.25 arcsec; paired t=0.134, p=0.895). Here we show that playing stereoscopic 3D video games modifies the precision, but not the accuracy of depth perception. These findings suggest that the enhanced stereoacuity did not result from reducing the effects of a disparity pedestal. These types of video games have potential therapeutic applications for improving stereo vision in patients with binocular vision anomalies.

Nova Southeastern University

Use of qPCR to Detect Genetic Modifications in Various Food Products

Anamichelle Madrid

Kendra Merchant

The quality of our food can heavily affect our way of living. However, it's been popularized that more expensive produce equals less processed and healthier food for us. In some instances, individuals are not able to afford high-quality food. The purpose of this study is to utilize quantitative PCR (qPCR) to detect genetic modifications present in both inexpensive and expensive food sold at supermarkets. This will help to determine if the monetary value of our produce is truly accruable to the value of our food. During this study, samples were obtained from Winn-Dixie and Whole Foods supermarkets. Samples from Winn-Dixie included saltine crackers, organic spaghetti, Tostitos ® chips, and wheat crackers. Samples from Whole foods included broccoli, papaya and banana. Gluten free bread was also compared with regular wheat bread to determine if there was any difference

in GMO content. DNA was isolated from the collected samples then amplified by PCR. The PCR products were then analyzed using agarose gel electrophoresis. This experiment hypothesized that GMO ingredients would be detected in both inexpensive and expensive produce. Our results showed that GMO ingredients were detected in all but one sample which was the Tostitos® chips. To confirm our results, we used qPCR to quantify the amount of amplified product. Unfortunately, the results were inconclusive, and it would be advised to complete the experiment again in the future.

Miami Dade College

Sexual Education Experiences among College Students in Florida

Ananda Myers & Joseph Marshall

Tiffany Chenneville

Despite research suggesting that comprehensive sexuality education (CSE) leads to healthier sexual attitudes and behavior, resulting in few negative sex outcomes (e.g., unintended pregnancy, sexually transmitted infections), abstinence-only education (ASE) is mandated in some states, including Florida. Given increasingly traditionalist education laws in the state, this study seeks to compare the sexuality education experiences of college students at a large public Florida university over a decade. Specifically, findings from Walcott et. Al's (2011) retrospective study of college students' sexuality education experiences will be compared to a more recent study (Whitmer, 2024). Using descriptive statistics and Z-test for two proportions, we will report and compare participant demographics, the timing of first sexual education experiences (e.g., elementary, middle, or high school), and the primary theme — CSE or ASE — of sexuality education experiences among college students over time. The implications of findings will be discussed within the context of the current sociopolitical environment.

University of South Florida

Preoperative Atrial Fibrillation and Perioperative Outcomes After Robotic-Assisted Pulmonary Segmentectomy

Ananya Siragavarapu

Dr. Eric Toloza

We investigated preoperative atrial fibrillation (AF) and surgical outcomes of patients who underwent robotic-assisted pulmonary segmentectomy (RAPS) for known or suspected non-small cell lung cancer (NSCLC) at an NCI-designated cancer center. We retrospectively analyzed patients who underwent RAPS from 2010 to 2023. Continuous variables are described as means with standard errors, while non-parametric numerical variables are described as medians with first and third quartile values. Categorical values are described as counts and proportions. The primary outcome was hospital length of stay (LOS). Tested secondary outcomes included postoperative complications, discharge disposition, and overall survival. Student's t test, Wilcoxon rank-sum test, Chi square/Fisher's exact test, and Kaplan-Meier estimates were used, with significance at $p \leq 0.005$. Of 265 study patients, 42 (15.8%) had preoperative AF. Patients with preoperative AF had greater mean age (71.9 yr vs 68.1 yr; $p<0.05$), higher female proportion (59.5% vs 40.5%; $p<0.05$) and more anticoagulation use (83.3% vs 37.8%; $p<0.001$) compared to those without preoperative AF. The most significant postoperative complication was estimated blood loss, with patients with preoperative atrial fibrillation exhibiting higher rates (75 mL vs 50 mL; $p<0.001$). Median hospital LOS for patients with preoperative atrial fibrillation was similar (3d vs. 3d) to that for patients without ($p=0.239$). Overall survival was better for patients without preoperative atrial fibrillation ($p=0.004$). We present demographic factors associated with and prognostic implications of preoperative AF on perioperative outcomes. Further research is required to investigate true postoperative AF and its association with postoperative embolic phenomena, other perioperative outcomes, and recurrence-free and overall survival.

University of South Florida

Battleship and the brain I: Pedagogical strategies for directional competence

Andrea Aviles & Isabel Fonseca

Patrick Smith

Game-based learning involves educators to choose targeted skills to be further reinforced from previously designed games. For instance, the board game Battleship has been used within different academic disciplines (e.g., Genossar et al., 2023; Kurushkin & Mikhaylenko, 2016), and elements from the game (e.g., determining "hits" from "misses") require spatial understanding of the board and potential targets. This process aligns with skills needed to learn the organization of the brain in disciplines like neuroscience (Guillot et al., 2007; Yousuf et al., 2024). The current study explored the spatial learning benefits from a modified Battleship game, as it was hypothesized that spatial learning would improve by playing the game. 38 first-year psychology majors were given an 8-item, multiple-

choice pretest to assess familiarity with anatomical directions and how directions are used to identify structures within the brain. After viewing a 5-minute video about directional navigation within the brain, participants were randomly assigned to one of two groups whose board coordinates (superimposed on a medial brain image) varied from standard Battleship coordinates to directional terminology coordinates (e.g., dorsal/rostral). A "hit" was made if a correct structure on the opponent's board was guessed. After four weeks of game play, participants were given short-term and long-term posttests (two weeks later) that were similar to the pretests. Results revealed significant improvements in directional familiarity (ps < 0.01) and marginal improvements for spatially identified brain structures. These results suggest that a modified Battleship strategy serves a valuable purpose when learning the anatomy of the nervous system.

Florida Southern College

Sudden Reductions and Pulsations in Solar Radio Emission: May 11th, 2001, Major Flare

Andrea Torres

Adolfo L. Mendez

Radio emission from solar flares offer a powerful diagnostic tool to address long-standing questions about different energy storage and release mechanisms, plasma heating, particle acceleration, and particle transport in magnetized plasmas as well as a physical picture of the associated active region at different levels of the solar atmosphere. The present work describes the radio emission associated with the May 11th, 2001, major flare at 237 MHz. The data was recorded with the solar radio polarimeter at the Basovizza Observing Station-Trieste Astronomical Observatory. Specifically, we analyze the evolution of radio emission during its maximum stage. Contrary to expectations, this major event appears to have no other counterparts associated with it, which is unusual for an event of such magnitude. Some possible generating mechanisms are discussed.

Miami Dade College

Monetary Incentives in Public Health

Andreas Uudmae

Eric Levy

The U.S. is facing a growing health crisis and struggling to deal with it effectively. Most attention is on treating the different health issues that arise from obesity, less has been done to address the root cause: unhealthy lifestyle habits. Economics could show us how to deal with this issue effectively. Monetary incentives could promote healthier behaviors in people and bring down the obesity rate. The purpose of my research is to investigate public opinion on offering monetary incentives to improve public health. I wrote a 20 question survey, distributed it through Amazon MTurk, and received 164 completed surveys. The data was analyzed using IBM's SPSS to assess public opinion on the effectiveness of monetary incentives for leading a healthier life. Specifically I'm testing to see if there is a statistically significant difference in opinions of men and women on these incentives being offered. Most notably, there was a statistically significant gender difference in opinions of the government providing positive monetary benefits for participating in fitness challenges. All surveyed women answered yes on this question while only 88.6% of men believed this to be a good idea. These results were statistically significant at the 1% level of significance. By incorporating gender differences into health policies, there may be new approaches to improve public health, especially when utilizing monetary incentives to create change.

Florida Atlantic University

Effect of CTSK siRNA-loaded NBs and LIPUS on Osteoporosis

Andres Alayon Mata

Dr. Mehi Razavi

Osteoporosis is a chronic weakening of the bones that increases the risk of fractures. Although this disease is highly prevalent, it still poses significant challenges for both patients and healthcare systems due to the lack of effective treatments. One novel approach to the treatment of osteoporosis is the use of nanobubbles (NBs), which could serve as a bone-targeted gene delivery system. In the present work, we have investigated the potential of cathepsin K (CTSK) siRNA-loaded NBs in combination with low-intensity pulsed ultrasound (LIPUS) as a novel therapeutic approach for osteoporosis through immunohistochemistry (IHC) staining of bone tissue in animal models. The study utilized an ovariectomized (OVX) mouse model to induce osteoporosis by simulating postmenopausal bone loss. Four treatment groups were established: an OVX group (control), an Alendronate group (standard osteoporosis treatment), a NB-LIPUS group (experimental group), and a LIPUS-only group. Treatments were evaluated at 1 and 3 months. Bone tissue sections were analyzed using IHC staining to visualize CTSK expression in tissue. Preliminary findings revealed that the

NB-LIPUS group exhibited reduced CTSK levels compared to controls. This demonstrates the potential of CTSK siRNA-loaded NBs and LIPUS as therapeutic approaches to treat osteoporosis. This work provides critical insights into integrating nanotechnology and ultrasound therapy for osteoporosis treatment. Future studies will aim to optimize the dosing regimen and evaluate the long-term impacts of this therapy on bone density and strength.

University of Central Florida

Identifying Mechanisms of Capsaicin Treatment in Breast Cancer Cell Lines

Andrew Reidenbaugh

Dr. Kimberly Dobrinski

Breast cancer will kill approximately 1 in 40 women, making it the second leading cause of death in women. Roughly 50% of HER2 cancers develop drug resistance; this study hopes to fight those statistics. Capsaicin has shown an ability to kill MCF-7 and MDA-MB-231 breast cancer cell lines, but the mechanism of cellular death that it enforces is still unknown. Three different assays were utilized to analyze the possibility of the Warburg Effect playing a role; lipid peroxidase, CyQuant, and oxygen plate analysis. The lipid peroxidase assay showed little change in oxidative stress from the DMSO control and the capsaicin treated cells. The CyQuant assay showed minimal differences in cellular death rates with varying concentrations of capsaicin. The oxygen plate analysis showed that different concentrations of capsaicin had only small changes in oxygen consumption. This data indicates that capsaicin kills cells through an alternate mechanism to the Warburg Effect. Moving forward, data collection will assess the possibility of an alternate pathway in the endoplasmic reticulum: Unfolded Protein Response (UPR), more specifically the activation of IRE1 protein coupled with GRP78 protein, and the activation of CHOP protein ultimately triggering a caspase cascade that forces cell death.

University of Tampa

Getting Under Your Skin (and into your Brain): The Problematic Effects of Galactic Cosmic Radiation on Cognition in Long Distance Space Missions

Andy Silva

Stephen M. Fiore

Galactic Cosmic Radiation (GCR) poses significant risks to astronauts during long-duration space missions. Although much progress is being made in other areas of science and engineering for the future of spaceflight, our understanding of the impact of GCR remains limited. The potential for negative consequences arise, not only with physical health, but also with behavioral and cognitive health. In this presentation we briefly review the research linking radiation exposure to problems in cognition. From this, we create a conceptual map illustrating the relationship between GCR exposure and cognitive decay. We link these to individual (e.g., working memory) and collaborative cognitive processes (e.g., team problem solving). This will be done through a review of the extant literature examining cognitive effects of GCR and organization of key themes and essential concepts relating cognition and GCR. Our goal with this conceptual map is to highlight potential gaps in existing research, help develop research questions, and guide future work for understanding the cognitive challenges posed by GCR in long distance space missions.

University of Central Florida

Evolutionary-Based Identification of Anti-Flavivirus Targets Within Predicted NS5 Structure in Yellow Fever Virus

Angela Dawson

Dr. Jessica Liberles

Flaviviruses are a diverse group of RNA viruses that pose global health concerns due to their high pandemic potential. Although there are vaccines for some flaviviruses that can prevent infections, there are currently no countermeasures to treat infections after they occur. Moreover, previous exposure to flaviviruses through vaccinations or natural infections can have cross-reactive effects that can enable viral entry and replication via antibody dependent enhancement (ADE). This study uses the nonstructural protein 5 (NS5) in the yellow fever virus as a representative member of Flavivirus to identify potential broadly neutralizing antiviral drug targets that are effective against various flaviviruses and avoid more severe disease outcomes through ADE. By comparing the amino acid sequence data for 20 flaviviruses and analyzing the evolutionary rates, confidence scores, and disorder predictions of a predicted protein structure of the yellow fever virus NS5, we identified conformationally flexible but highly conserved protein pockets that are critical to the viral life cycle. The pockets found within NS5 in the predicted protein structure for the yellow fever virus could serve as candidates for potential drug targets for pan-flavivirus antiviral drugs that inhibit

flavivirus replication without the risk of ADE. Further investigation is necessary to validate the existence of these pockets in real protein structures and determine how to use conformationally flexible pockets in the development of antivirals.

Florida International University

Fatigue Behavior and Microhardness Analysis of Titanium-6Al-4V

Angelena Luciano

Dr. Jutima Simsiriwong

The objective of this research is to determine the fatigue behavior of Titanium-6Al-4V (Ti-64) under rotating-bending cyclic loading. The geometries and dimensions of the test specimens were designed in accordance with ISO 1143:2010E standards. These specimens were fabricated using a CNC lathe and manually polished in the longitudinal direction with 400-3000 grit sandpaper to remove any machining marks. Fatigue testing was conducted using an ADMET eXpert 9300 Series Rotating Beam (R-B) test system at stress amplitudes ranging from 500 to 900 MPa. The R-B test system employs a 4-point loading method to ensure a uniform bending moment across the gauge section, minimizing variables and enhancing repeatability. This configuration ensures consistent stress distribution, with the entire circumference of the specimen cyclically transitioning fully between tension and compression during each completed cycle. The experimental data were plotted on a conventional stress vs. life (S-N) curve, and fractographic analysis was performed using a Keyence VHX-6000 optical microscope to identify the crack initiation sites. Additionally, microhardness analysis was carried out on as-received Ti-64 bars using a Shimadzu HMV-G21-FA microhardness tester to investigate potential discrepancies in hardness values among the as-received wrought bars. This research will be able to inform the engineering community in the future and help understand the role that Ti-64 will play in the future.

University of North Florida

Comparative analysis of the Giemsa and Feulgen stain for the micronucleus assay in sandbar shark Carcharhinus plumbeus.

Angelo Cantu

James Gelsleichter

The micronucleus (MN) assay is a commonly employed genotoxicity test used for detecting DNA damage resulting from exposure to chemical pollutants and other environmental stressors. MN are small, chromatin-containing round bodies visible in the cytoplasm of cells, which can represent chromosomal fragments resulting from un- or mis-repaired DNA strand breaks and/ or small extrachromosomal bodies formed from genomic instability. The MN assay is routinely used in fish toxicity studies because it can be easily performed using peripheral blood smears due to the occurrence of nucleated erythrocytes in most non-mammals. However, to date, very few studies have attempted to use the MN assay in elasmobranchs (sharks, skates, and rays) or have examined whether staining procedures influence the sensitivity of this test. In previous studies, I found data to support the premise that MN occurrence is overestimated using the Giemsa protocol compared with other procedures. Therefore, the purpose of this study is to compare the non-DNA-specific Giemsa stain against the DNA-specific Feulgen stain to determine if there is a difference of MN present in Elasmobranchs, making use of blood samples non-lethally obtained from individuals from sandbar sharks, Carcharhinus plumbeus, collected using bottom longline and drumline fishing from northeast Florida and southeast Georgia estuaries.

University of North Florida

Beyond the Classroom: The Power of Discord to Build Community and Enhance Student Learning

Angelys Torres Cancel

Wendy Chase

My research project is about an online platform called Discord that I created for my college to create a sense of community. Here, students can ask questions and talk with other students about academic resources, hobbies, and much more. Discord has several benefits, including the choice to be anonymous when creating an account, and it features chat and voice channels where the students can communicate. Discord's anonymity and varied forums help to create a safe environment for students and prompt help-seeking behavior, as not every student is traditional. There is a mixture of online and in-person students interacting on Discord with different perspectives and responses when helping others. Collecting surveys and further research will highlight the importance of higher education institutions creating a safe online platform like Discord. This can improve academic success by raising awareness of institutional resources, creating peer support, and encouraging help-seeking behavior. All

benefits are for both in-person and online learners. My research question is this: How can students' learning and college experiences be enhanced both in and out of a classroom when an educational institution creates and supports an online platform where students can ask questions and exchange responses anonymously?

Florida SouthWestern State College

Blocking the Oncogenic Wnt Signaling Pathway for Cancer Therapy Using a Novel Small Molecule

Ania Kelegama

Brian K. Law

Colorectal cancer (CRC) is a leading cause of cancer-related deaths, with many cases driven by hyperactivation of the Wnt/ß-catenin signaling pathway. This pathway fuels tumor growth by promoting cell proliferation, epithelial-mesenchymal transition, cancer stem cell renewal, and resistance to chemotherapy. Despite its importance in cancer progression, effective inhibitors of this pathway remain limited, highlighting an urgent need for novel therapeutic strategies. A critical component of the Wnt/ß-catenin pathway is the receptor proteins LRP5 and LRP6, which must be properly folded and functional to activate the pathway. Our laboratory identified a group of compounds termed disulfide disrupting agents (DDAs), which are inhibitors of several Protein Disulfide Isomerases (PDIs), including AGR2, AGR3, ERp44, and PDIA1. DDAs also disrupt the folding of LRP5 and LRP6, effectively shutting down Wnt signaling. MESD, an ~30 kDa specialized chaperone protein, is essential for the proper folding and transport of LRP5 and LRP6. Immunoblot analysis under non-reducing conditions shows that DDA treatment increases the levels of an MESD immunoreactive band that migrates at ~80 kDa. It is therefore possible that PDIs regulate LRP5 and LRP 6 folding indirectly by regulating the disulfide bonding state of MESD. This study aims to: (1) identify the ~50 kDa protein disulfide bound to MESD, which correlates with its inactivation after DDA treatment, and (2) demonstrate the functional importance of the interaction of MESD with this unknown protein. These findings will enhance our understanding of DDA function and advance therapeutic development for Wnt-driven CRC.

University of Florida

E-cadherin expression as a Prognostic Biomarker in Colorectal Cancer

Anika Bhandare

Dr. Mintoo Patel

Colorectal cancer (CRC) is the third most common cancer in the United States, with increasing incidence among younger populations despite remaining predominantly prevalent in individuals over 65. This study investigated the role of E-cadherin, a critical cell-cell adhesion molecule, in CRC development and progression. E-cadherin regulates cellular polarity, differentiation, proliferation, and migration through complex cytoskeletal network associations. Its loss disrupts intercellular adhesion, enhancing cellular motility and facilitating the epithelial-to-mesenchymal transition (EMT), a crucial process in metastasis. We examined E-cadherin expression across different CRC stages using immunohistochemical analysis of de-identified formalin-fixed paraffin-embedded biopsy tissue samples, categorized as precancerous, cancerous, and normal noncancerous groups. A systematic meta-analysis of PubMed literature complemented our primary analysis. Immunohistochemical staining revealed robust E-cadherin expression in normal mucosal epithelial cells, while cancerous tissues exhibited reduced levels correlating with advanced cancer staging. Low E-cadherin levels significantly associated with adverse clinicopathological features and potentially more aggressive disease progression. The meta-analysis substantiated these observations, reinforcing E-cadherin's potential diagnostic and prognostic significance as a molecular biomarker. This study underscores E-cadherin's potential as a supplementary biomarker in routine histopathological examinations. By providing nuanced molecular insights into cancer stage and progression, E-cadherin analysis could facilitate personalized, targeted clinical treatment strategies for CRC patients. This project is supported in part by grant in aid of research from the Florida Endowment for the Sciences of the Florida Academy of Sciences.

South Florida State College

Unsteady Dynamics of Rapidly Pitching and Decelerating Swept Plates

Anirudh Sriram & Matthew Mechlowitz

Dr. Samik Bhattacharya

During landing, natural flyers such as birds often execute a perching maneuver, which involves rapidly pitching their wings upward while

decelerating to a complete stop. This study is motivated by the observation that some birds fold their wings to create varying wing sweep orientations during perching. An experimental investigation was conducted to examine the aerodynamic characteristics of different wing sweeps in a perching maneuver. We tested four wing configurations-rectangular, backward-swept, forward swept, and double-swept wing-during a deceleration maneuver from a Reynolds number Re=6500. Two shape change number, = 0.3 and 0.9, were considered. Using force measurements and particle image velocimetry (PIV), we compare the temporal evolution of the instantaneous forces and the vortex dynamics among the different wing shapes. Our findings show that in both the test cases, the backward-swept wing generated the higher lift force, while the double-swept wing produced the lowest. At = 0.9, the double-swept wing generated near zero lift force with drag comparable to other wings, making it suitable for perching maneuvers. PIV results revealed that at = 0.9, the double-swept wing generated a starting vortex on the underside of the leading edge (LE), extracting energy from the LE shear layer and delaying the formation of coherent leading edge vortex (LEV). This starting vortex and delayed formation of LEV reduced the lift force of the double-swept wing.

University of Central Florida

How Team Roles Impact Stress Through Emotional Regulation and Positive and Negative Emotions in Two-Week Long Space Analog Missions

Anisha Bissessar & Milouni Patel

Dr. Shawn Burke

Team roles (e.g., Commander, Medical Officer, etc.) are integral to the functioning and success of crews in isolated, confined, and extreme (ICE) environments like space analog missions (Golden et al., 2017). However, the demands and responsibilities of different roles inherently vary influencing how individuals may experience and regulate emotions depending on their assigned role (Burke et al., 2019; Madrid et al., 2019). The emotional states of these team members mediate these dynamics that play a pivotal role in this context, with team members' emotional states directly influencing interpersonal relationships and group performance (Barsade, 2012). Similarly, trait affect regulation which refers to an individual's inherent tendency to manage their emotions and emotional responses within a team setting, hints at one's ability of maintaining resilience, promoting team cohesion, and mitigating stress in high-stakes environments. This exploratory study examines the potential relationship between team roles and stress levels, focusing on the mediating influence of positive and negative affect and trait affect regulation. Using self-reported data collected from simulated space missions, we explore how being assigned to a specific team role (e.g., commander, medical officer) may impact stress levels through fluctuations of positive and negative affect, controlling for trait affect regulation. This research aims to provide insights into how one's assigned team role impacts their psychosocial experience in an ICE mission. These findings have implications for optimizing team structure and organizational strategies, aiming to enhance well-being, team cohesion, and overall performance in long-duration space exploration missions.

University of Central Florida

Corrosion Performance Evaluation of Novel Anodized Aluminum

Ann Jager

Dr. Christopher Alexander

Anodized aluminum is used in versatile ways in everyday life, implemented in cookware, phones, automotive parts, structural components and aircraft parts. This research evaluates the performance of novel anodized aluminum in comparison to traditional anodized aluminum. In its natural state, aluminum has an oxide film that passively protects the metal from corrosion. Anodization is an electrochemical process that is performed on aluminum to create a thicker, more durable, and more corrosion resistant oxide layer. Traditional anodization faces limitations regarding its oxide layer's durability and wear resistance. This research evaluates the performance of aluminum that is anodized in an electrolyte containing potassium permanganate as an additive. Potassium permanganate can aid anodization by increasing the growth rate of the oxide with a denser matrix, therefore creating a more efficient anodization process. Measurements are conducted on samples of two anodization processing batches (traditional and novel) and two different seal types (hot water and dichromate). Surface characterization was completed through scanning electron microscopy (SEM) imaging, digital microscope imaging, coating thickness measurements, and profilometry to help determine surface defects and consistency in the coating. Electrochemical testing includes open circuit potential (OCP) measurements, potentiodynamic scans (PDS), and potentiostatic electrochemical

impedance spectroscopy (EIS). These methods help assess the stability of the sample and using these destructive and non-destructive testing methods, corrosion resistance can be determined. Surface characterization methods give insight into how consistent each anodization process is as well as their deficits. Corrosion resistance is quantified from electrochemical testing to compare the performance of each anodization process.

University of South Florida

Systematic Review of Potential Treatment and Prevention Options for John Cunningham (JC) Virus and Progressive Multifocal Leukoencephalopathy (PML)

Anna Barnes & Zachary Nesta

Dr. Olukemi Akintewe

Human polyomavirus 2, alternatively referred to as John Cunningham (JC) virus, lies dormant in more than half of the adult human population. It does not cause problems for the majority, but may develop into a serious brain infection called progressive multifocal leukoencephalopathy (PML) in those who have weakened immune systems due to various corticosteroid or immunosuppressive therapies. Individuals with autoimmune conditions are also at risk for PML; in fact, PML is most common among those with an HIV-1 infection. PML targets the myelin of white brain matter and is characterized by dementia, poor coordination, progressive weakness, aphasia, and vision issues depending on what area of the brain is affected. The progression of such deficits leads to disability and, frequently, death. PML is currently irreversible, however various options may extend survival and stall progression. In this literature review, a software –– Rayyan –– was used to analyze 2,323 PubMed articles published between 2010-2024 focused on JC virus and PML treatment and prevention options. Current treatments focus on immune reconstitution, antiretroviral therapy (ART), and novel strategies such as antimalarial medications, T-cell adoptive transfer therapies, or immune checkpoint inhibitors. The outlook for individuals with PML heavily depends on the treatment received. In general, PML has a mortality rate of 30 to 50 percent in the first few months following diagnosis. The aim of this review is to provide a comprehensive base of knowledge that may be used to better the quality of life of people at risk of or those with PML.

University of South Florida

A Liver-Fat Crosstalk for Iron Flux During Healthy Beiging of Adipose Tissue

Anna Cubito

Dr. Zhiyong Cheng

Beiging of adipocytes is characteristic of a higher number of mitochondria, the central hub of metabolism in the cell. However, studies show that beiging can improve metabolic health or cause metabolic disorders. Here we discuss a liver-fat crosstalk for iron flux associated with healthy beiging of adipocytes. Deletion of the transcription factor, a protein that control gene activity, FoxO1 in adipocytes (adO1KO mice) induces a higher iron flux from the liver to white adipose tissue, concurrent with higher activity of mitochondrial biogenesis that increases iron demands. In addition, adO1KO mice adopt an alternate mechanism to sustain mitophagy, which enhances mitochondrial quality control, thereby improving mitochondrial respiratory capacity and metabolic health. However, the liver-fat crosstalk is not detectable in adipose Atg7 knockout (ad7KO) mice, which undergo beiging of adipocytes but have metabolic dysregulation. Autophagic clearance of mitochondria is blocked in ad7KO mice, which accumulates dysfunctional mitochondria and elevates mitochondrial content but lowers mitochondrial respiratory capacity. Mitochondrial biogenesis is comparable in the control and ad7KO mice, and the iron influx into adipocytes and iron efflux from the liver remain unchanged. Therefore, activation of the liver-fat crosstalk is critical for mitochondrial quality control that underlies healthy beiging of adipocytes.

University of Florida

Preliminary Study of Bidens alba Plant using Thin Layer Chromatography and Antioxidant Essays

Ann-Adley Claveus

Dr. Maria del Carmen Pina

Under the direction of Dr. Maria Pina, Chemistry.

Natural Products Chemistry.

Medicinal plants possess bioactive chemicals that are responsible for inhibiting the dangerous effects of oxidative stress. They are essential in the practice of traditional medicine, and scientists have established that medicines derived from plants are safer than their synthetic analogs. This experiment focuses on the Bidens alba, a plant native to the Southeastern United States as well as South and Central America and the Caribbean. It has been used for its anti-inflammatory, wound healing and

antimicrobial properties by various cultures. The plant was collected at the organic garden at St. Thomas University. It was separated into parts: roots, leaves, stems, and flowers. The material was dried in the incubator at 37˚C for 2 days and ground. The extracts were prepared by maceration using 5g of plant material in ethanol and ethanol/hexane 80/20; solutions were filtered and analyzed using thin-layer chromatography (TLC), which showed numerous components of different polarities. Preliminary studies of antioxidant activity of Bidens alba plant were performed with 2,2-diphenyl-1-picrylhydrazyl free radical scavenging (DPPH) and Total Phenolic Content (TPC) assays. Analysis was carried out in triplicate. Our findings indicated that the Bidens alba extracts possess potent antioxidant activity in its stems, roots, and leaves, and the flowers exhibit notably highest levels of antioxidants. Further antioxidant analysis will be conducted in the future and flower extracts are under evaluation for cytotoxicity tests in vitro.

St. Thomas University

Digital Twin Streetscape Modeling through Integrating LiDAR Vehicle Detection into Simulation Environments

Anton Rajko

Jinwoo Jang

This project harnesses LiDAR technology and 3D virtual simulation to construct a digital twin of West Palm Beach, Florida. The primary focus is to enhance understanding of the dynamic interplay between vehicles and pedestrians. The simulation provides an immersive and highly detailed 3D representation of the city, offering an interactive platform to visualize and analyze urban infrastructure and traffic dynamics at a street level.

By integrating data from LiDAR sensors, the system precisely tracks the movements of both vehicles and pedestrians, mirroring their actions within the simulation. The system operates frame by frame, processing LiDAR data to determine the precise positions of vehicles and pedestrians. This data is then used to dynamically place 3D models in the appropriate locations within the Unity simulation, creating a realistic and continuously updated virtual environment. This approach ensures a high level of accuracy and responsiveness, making the simulation suitable for a wide range of applications, from traffic flow analysis to pedestrian safety studies. One of the key objectives of the project is to demonstrate how the integration of LiDAR and digital twin technologies can revolutionize urban planning and traffic management. By modeling both vehicles and pedestrians, the simulation enables stakeholders to assess interactions between different road users, identify potential congestion points, and explore the impact of proposed infrastructure changes in a virtual setting.

Florida Atlantic University

Training Coral for the Inevitable

Antonio Tinoco

Mintoo Patel

As the rise of ocean temperatures continues to become a threat to many vital coral reefs worldwide, the effort and focus on replenishing these dying ecosystems intensifies alongside it. However, these ecological movements to replace what bleaching coral reefs have lost may not result in the desired outcome if the corals cannot withstand the rising temperatures and changing environment. Although there are other methods such as crossbreeding and assisted evolution that move alongside, coral conditioning shines through due to the speed of the process. Previous studies suggest that coral reefs that experience high environmental stress become more resilient to future stressors they may face. To explore these connections, zoanthids (zoantharia) and Duncan coral (Duncanopsammia axifuga), which are common among reefs, will be tested. Fragments of both corals will be placed within a test tank that will fluctuate between 28oC and 30OC, then a period of stagnant temperature of 32oC for a consecutive 75 days. Remaining fragments will be kept in a control tank that will contain optimal temperatures and conditions for both Duncan coral and zoanthids, which is 79oC. Once the coral conditioning reaches its end, the stress response towards heat stressors will be tested upon both groups. Overall, these results will show the efficacy of conditioning of replacement coral. The understanding of what develops the resilience to environmental stressors such as rising temperatures, is the key to a bright future for coral reefs.

University of South Florida

Impact of Diabetic Retinopathy Severity on the Progression of Primary Open Angle Glaucoma

Anvitha Makkena, Esha Haque, Trisha Pitchala, Megan Watters, Vasco Sanchez Sr., Kayla Cariss, Samika Kalavadia & Shreyas Sathya

Dr. Olukemi Akintewe

Diabetic retinopathy (DR) and primary open-angle glaucoma (POAG) are common ocular conditions that frequently coexist, contributing

to preventable blindness. This systematic review explores the relationship between DR severity and POAG progression, focusing on their shared pathophysiological mechanisms. DR, a microvascular complication of diabetes, progresses through stages classified by the ETDRS scale, with factors such as hyperglycemia, hypertension, and diabetes duration accelerating microvascular and retinal damage. POAG, a chronic optic neuropathy, is characterized by progressive retinal nerve fiber layer (RNFL) thinning and is often linked to elevated intraocular pressure (IOP) and visual field deterioration. The review synthesizes evidence from PubMed, Scopus, and other sources, highlighting how advanced stages of DR may exacerbate POAG progression. Shared mechanisms, including IOP fluctuations, retinal blood flow changes, vascular dysfunction, and optic nerve head alterations, contribute to the worsening of both conditions. Understanding the link between DR and POAG is crucial for early detection and intervention. This review emphasizes the need for integrated management approaches, improved diagnostic strategies, and timely treatment to prevent further ocular complications. By addressing shared risk factors, healthcare providers can help reduce preventable blindness and improve patient outcomes globally.

University of South Florida

What is the Relationship between the Frequency of College Students' Social Media Use and Social Discomfort in Face-to-Face Interaction?

Anwyn R Schiek & Veronica Yanes-Nadal

Ben Graydon

Social media has significantly altered interpersonal interactions among college students, potentially impacting their comfort levels in face-to-face encounters and mental health. Social media can affect one's mental health, especially in reference to social anxiety (Javed et al., 2022). This study aimed to assess the comfort levels of Daytona State College students in various face-to-face interaction scenarios. Utilizing a modified version of the Social Avoidance and Distress Scale (Watson & Friend, 1969), researchers surveyed a total of sixty-seven Daytona State students to measure social anxiety levels among daily, weekly, and monthly social media users. The results of the study indicate that students who reported using social media daily more often answered in agreement to questions asking them to identify their social comfort although these results were not found to be statistically significant. The study was limited to a small sample size and administered at only one community college with a survey duration of one week. Future researchers could attempt to improve outreach by surveying students for a longer duration and at multiple colleges including State Universities like Florida State University to get a more diverse sample with larger populations.

Daytona State College

Harnessing Endophytic Fungi: A Bioassay-Guided Approach to Discover Novel Antifungal Metabolites Against Candida spp

Arshia Esmaeilian

Ezequiel Cruz Rosa

The global rise in fungal resistance to conventional therapies, particularly among Candida species, underscores the urgent need for novel antifungal solutions. Endophytic fungi, known for producing diverse secondary metabolites with protective functions, offer a promising avenue for drug discovery. This study focuses on TAP14-269D-4, an endophytic fungus from the genus Talaromyces, isolated from the root of a pine tree in Tapachula, Mexico. The primary objective is to explore the bioactivity of its secondary metabolites against Candida species, including those responsible for Candidiasis and Candidemia, through a bioassay-guided approach. Metabolite structures will be elucidated using high-resolution mass spectrometry (HRMS) and nuclear magnetic resonance (NMR) spectrometry. Additionally, artificial intelligence-driven dereplication tools, such as SMART NMR and DeepSAT, will streamline structural identification by comparing inputted HSQC data to known compounds. This integrative approach aims to accelerate the discovery of potentially novel antifungal metabolites with therapeutic applications.

University of South Florida

Maternal Investment and Gestational Indicators in in the Atlantic Stingray

Ashlee Locker

Annais Belinda Muschett-Bonilla

Reproduction in Elasmobranchii (cartilaginous fish) is not widely known. Understanding their reproduction is important for their conservation and particularly important for species vulnerable to bycatch mortality. This study aims to investigate reproductive patterns and gestational development of Hypanus sabinus. In order to do this, we obtained specimens post-mortem to collect macroscopic morphometric measurements from the uterus. We

assessed uteri for uterine length, width and villi length (mm) at each gestational stage. Gestational stages were divided into early, mid, and late stages based on their 4 month gestation period and morphometric measurements were averaged for each stage. ANOVA was used to test for significant differences between gestational stages. Descriptive analysis will describe the physical changes that occur during gestation such as the color of intrauterine contents. This data will allow us to determine the gestational stages of post-mortem species that died as bycatch during fishing operations. Many threatened and endangered sharks and rays are caught as bycatch. This study will result in the ability to determine reproductive patterns and gestational periods throughout the year that are vital for species conservation.

Florida State University

Sudoku and Emotional Memory Interference

Ashlee Ross

Max Owens

Clarity (vividness) and unpleasantness (emotionality) are key components in measuring the effectiveness of task measures for reducing the impact of negative autobiographical memories during recall. Working Memory theory states that reflecting on a memory requires cognitive resources. Testing the cognitive demands of a task can determine its strength as a treatment method for clinical populations. The present study aimed to illustrate the effect of sudoku on emotionality and vividness ratings pre- and post-task, using the Visual Analogue Scale (VAS). Using a between-subjects experimental design, participants were randomly assigned to one of two conditions. In the first condition, participants solely reflected on their negative autobiographical memory for thirty minutes. In the second condition, participants reflected while simultaneously completing a sudoku task. The purpose of this was to test the load of a sudoku task on working memory resources. Based on the WM theory, sudoku should be an effective measure as it demands cognitive resources throughout the task. Survey data were collected using Qualtrics and analyzed using two Univariate ANOVAs. Results indicated that the dual-task group reported post-task reductions in emotionality and vividness. The control group reported a post-task increase. These findings supported our hypotheses that participating in an engaging task resulted in fewer cognitive resources available for memory recall. This contributes to the notion that sudoku is a task worth considering for future dual-task paradigms. In this regard, sudoku may present a useful distraction for use in clinical settings. Future studies should test whether it facilitates therapy as usual.

University of South Florida

Identifying extracellular matrices in chondrocyte using click chemistry.

Ashley Flanagan

Thomas Kean

The recent development of click chemistry has led to the optimization of accelerated chemical synthesis without its complexities. This study explores the efficiency of chemical synthesis between an azide-modified bio-incorporated monomer and the alkyne in a fluorescent dye, providing a more orderly identification extracellular matrices within chondrocytes. Rabbit chondrocyte aggregates (3D cartilage cultures) were treated with either azide-modified media (5-(azidomethyl)-2-deoxyuridine (AmdU), N-azidoacetyl galactosamine-tetraacylated (GAL), l-Azidohomoalanine (AHA)), in limiting chondrogenic media, or normal chondrogenic media, with or without transforming growth factor beta 1. AmdU tracks DNA, GAL tracks glycosaminoglycan (GAG), and AHA tracks collagen. After treatment, the cells were either fixed or frozen. The fixed samples were stained with Alexa Fluor 488 dye and processed for imaging in an Image Xpress. They were stained with Hoechst dye and imaged again. Frozen samples were digested and analyzed for fluorescence using a spectramax with the proper reagents. They were compared to DNA standards, GAG standards, and hydroxyproline standards. We expected that DNA would have more concentrated points of fluorescence than GAG or collagen. This expectation was met, verifying an effective way to distinguish where extracellular matrices and DNA are in the cell. Our results made it evident that click chemistry can be used as a reliable method in determining extracellular matrices and DNA.

University of Central Florida

Investigation on NS5 of the Spondweni Virus as a Therapeutic Target for Broad-Spectrum Antiviral Strategies

Ashley Rosquete

Dr. Jessica Liberles

Flavivirus are a group of 85 related RNA viruses with specific antibody dependent enhancement (ADE) where antibodies can enhance virus entry and replication. The Spondweni virus (SPOV) is a type of Flavivirus that is known to pose significant

global health risks. Unlike other flavivirus, SPOV is more geographically isolated. This combined with the lack of a vaccine targeting SPOV emphasizes the need for targeted antiviral strategies. This study investigates the potential of the SPOV's non-structural protein 5 (NS5) as a target for antiviral development based on evolutionary relationships, structural properties, and binding pockets. Using computational methods, the NS5's was investigated due to large size and its role in viral replication and immune evasion. Phylogenetic analysis of the SPOV confirms close relation to the Zika Virus and conserved regions within the NS5 identifying the most critical regions. Structural modeling provided high confidence models with residues in the proteins core showing greater disorder. Evolutionary rates analysis highlighted conserved catalytic sites. Among the 47 binding pockets identified in NS5, five were prioritized based on their druggability scores, residue conservation and low disorder rates. Druggability scores indicate ability of a pocket to be modulated by drugs. One pocket was identified as the most promising target for antiviral intervention with a high druggability score, minimal evolutionary variability, high structural confidence, low disorder rates, and preferred location near surface of the protein. Targeting a stable, druggable pocket of NS5 in SPOV could enhance vaccine development and pave the way for new treatments.

Florida International University

Development of an Organic Chemistry Concept Inventory using Mixed Methods

Ashley Santonil

Dr. Erin Saitta

Concept inventories are tools used to identify misconceptions of a topic and are frequently used to help students and instructors identify gaps in understanding and correct those misconceptions. This project examines the construction of a concept inventory designed to measure student conceptions of foundational topics in organic chemistry. Unlike current chemistry concept inventories which measure one topic, this new instrument aims to connect student understanding in multiple foundational topics that are built across a chemistry program. This concept inventory has 18 multiple choice questions which assess hydrogen bonding, resonance, hybridization, thermodynamics, electrophiles, and pKa. The items were designed systematically by chemistry faculty and tested through multiple rounds of interviews and assessments. This poster presents student interview data, expert revisions, and statistical analysis from students enrolled in Organic I and Organic II. Findings from this project will progress the ability to identify student understanding of foundational concepts in order to better target interventions to improve student learning.

University of Central Florida

Mitigation of Harmful Algal Blooms Using Porous Metal Halide Semiconductor (DHT) Bi2I8

Audrey Babcock

Dr. Ioannis Spanopoulos

Harmful algal blooms (HABs) have emerged as a critical environmental threat in recent years, largely due to increasing water temperatures and pollution. Red tide is caused by the HAB Karenia Brevis (K. brevis) that releases brevetoxins which kill marine life and negatively impact public health due to contamination and air-borne toxins. Many attempts at mitigating this issue have been made with little success highlighting the need to address this growing problem. (DHT)Bi2I8 is a newly developed porous metal halide semiconductor (PMHS) composed of cheap, biocompatible elements with attributes superior for mitigating K. Brevis over other traditionally used compounds such as hydrogen peroxide or copper. These attributes include outstanding optical properties with broad band edge emission and the ability to generate reactive oxygen species (ROS) which can inhibit HAB growth by photocatalytic degradation. (DHT) Bi2I8 is also stable in water for over 1 year which makes it an excellent candidate for use in aquatic environments. When irradiated with visible light, the compound generates ROS which allows for selective inhibition. (DHT)Bi2I8 has also been tested at the same concentrations against algal strains Nanochloropsis Oculata (N. Oculata) and Tetraselmis suecica (T. suecica) and was shown to have negligible impacts. Using PMHS provides a novel and sustainable route to mitigate HABs and protect marine life and coastal ecosystems.

University of South Florida

Caribbean King Crabs: Coral Reef Restoration and Community Engagement

Audrey Brandt

Dr. Catherine Wilkins

Coral reefs are in crisis from complex interactions between warming ocean temperatures, ocean acidification, and localized stressors. Coral reef degradation in the Caribbean is marked by a shift in species composition from coral to macroalgae, which inhibits corals' growth and

survival. Scientists at Mote Marine and Instituto Mexicano de Investigación en Pesca y Acuacultura Sustentable laboratories are culturing Caribbean King Crabs, an indigenous, highly effective algal grazer, to restore Caribbean reefs by removing macroalgae and allowing corals to grow. Due to the novel nature of Caribbean King Crab restocking programs, understanding and awareness of these programs is limited among the general public. Yet, community buy-in is a significant predictor of long-term success of ecosystem restoration projects. Using information collected through a literature review and a semi-structured interview with two stakeholders in Mexico, I developed a narrative ArcGIS StoryMap to inform community members of current efforts to culture Caribbean King Crabs, the potential social and economic benefits of coral reef restoration, and ways to involve oneself in these projects. I anticipate that the StoryMap will increase community buy-in as Caribbean King Crab stocking programs progress by engaging community members at the early stages of the programs.

University of South Florida

Post-traumatic Growth Intervention at Valerie's House: A New Horizon for Bereaved Children.

Austin Bradley Wolin, Alexa Gleiber & Ayman Haroon

Dr. Widaad Zaman

Childhood bereavement is an unfortunate reality for many children (Burns et al., 2020) that can cause the child to have many adverse reactions (SAMHSA, 2023). These adverse reactions, however, can lead to a positive change known as Post-traumatic Growth (PTG). PTG is a positive change in philosophy that occurs following a traumatic situation (Tedeschi et al., 2018). This phenomenon has shown positive improvement in five dimensions towards an individual's overall psychological health: personal strength, new possibilities, relating to others, appreciation of life, and spiritual change (Tedeschi & Calhoun, 1996). Literature on PTG relating to children has focused on tracking the growth of children (e.g., et al., 2020; Kilmer et al., 2009; Xu et al., 2019). The present study aims to examine one such program's aid in the development of PTG. Valerie's House is a grief support group designed for bereavement intervention among children. Participants will be sampled from this program in a short-term longitudinal design to assess PTG (assessed using the PTGI-C-R) in relation to post-traumatic stress disorder (PTSD) symptoms (assessed using the CPSS-V SR), resilience (assessed using the CD-Risc), and narrative elaboration of the traumatic experience (assessed with open-ended questions). It is expected that from time 1 to time 2, PTG will be higher, PTSD symptoms will be lower, higher PTG will show higher resilience, and participants with greater narrative elaboration, specifically at time 1, will show higher PTG and lower PTSD symptoms at Time 2.

University of Central Florida

Gendered Depictions of Household Care Responsibilities in Advertisements: A Quantitative Content Analysis

Ava Griner

Alessandra Noli Peschiera

Household care labor has been shown to be unequally distributed between men and women in the United States, and caregiving is traditionally seen as a feminine task. Media representations of caregiving have reinforced this gendered view of household labor, negatively affecting all populations exposed to such media. There does, however, exist a gap in the research regarding representation within advertisements for household products. This study aims to answer the question of who, in terms of gender and race, is depicted as responsible for household care tasks within these advertisements. The top 20 leading home care brands were identified for this study using Statista. Advertisements were randomly selected from these brands and included if they were in English, did not contain animated characters, and had a character's face or 50% of their body visible. A quantitative content analysis was then used with 3 coders to determine the race and gender, along with other demographic information, of the characters, and which characters were depicted as responsible for the household chores. We expect to determine whether advertisements published in the wake of recent social justice movements show any change in representation from their predecessors. This would be a step to determining whether advertisements for household care products are feeding into stereotypically gendered household labor distribution.

Florida State University

Masculinity, Protestantism, and Exclusionary Fitness Culture

Avery Solis

Dr. Maria Cristina Ramos

Strength-oriented fitness culture emerged and has been adopted to reaffirm masculinity and uphold

Protestant values of self-denial and hard work. While researchers have identified connections between fitness culture, masculinity, and Protestantism, existing studies have neglected to examine messaging that comes directly from gyms. Using deductive content analysis of the Instagram posts of three commercial gyms in Tallahassee, Florida, this study aims to determine whether strength-oriented gyms use language and imagery that reinforces ideals of hegemonic masculinity and Protestantism, and whether such language and imagery expresses aversion to femininity. Posts sampled in this study used language and imagery that reinforced white middle-class beauty standards, emphasized the value of masculine ideals of strength and dominance, and upheld the Protestant Work Ethic by moralizing discipline and hard labor. The posts sampled implored men and women to embody white middle-class beauty standards—which confine women to small, thin bodies and exalt highly muscular male bodies—as well as the Protestant Work Ethic. For women, these two ideals necessarily contradict one another, while they are complimentary for men, implying that strength-oriented fitness spaces (often inadvertently) devalue femininity and valorize masculinity. These posts posit femininity as a weakness and a specter to be feared, thereby constructing a crisis of masculinity, and urging men and women to surveil and moderate their gender expressions. This finding implies that both men's and women's claims to strength-oriented fitness space are precarious, though this precarity is more pronounced for female gym-goers.

Florida State University

Leveraging Machine Learning to Aid in the Utilization of Diagnostic Testing in Thrombotic Thrombocytopenic Purpura

Avery Teman

Dr. Maximo Marin

Artificial intelligence (AI) has the potential to revolutionize the medical field with machine learning utilization, improving patient outcomes. Thrombotic thrombocytopenic purpura (TTP) is a life-threatening, blood clotting disorder which is confirmed by the ADAMTS13 activity assay. The improper usage of ADAMTS13 and constrained resources in laboratories leads to inefficient patient care. This research project will result in a decision tree (DT) algorithm, aiding in efficiently diagnosing TTP. This machine learning (ML) support tool would reduce the over-utilization of ADAMTS13 testing and save lives. In Phase 1, the principal investigator coded the ML algorithm, which was developed by training and testing with preliminary data, producing an overall accuracy of 81%. Phase 2 curates a collection of patient data using the UF Health electronic health record for validation of the algorithm. Phase 3 includes additional testing with new data, while Phase 4 requires review of guidelines for implementation into the laboratory. This knowledge will help close the mortality gap for TTP and provide the framework to advance the development of AI support tools for various diseases. The overarching mission is to create the lab of the future where AI-generated decision support tools guide better diagnostic testing to aid clinicians in improving patient care.

University of Florida

Characterizing Nos1 Neuron Activity in Non-Homeostatic Feeding Behaviors

Avinash Kanakam

Dr. Sarah Stern

The activity patterns of neurons are what form the physiological basis that underlies different behaviors. In this project, we hypothesize that the Nos1 neurons of the Insular Cortex are behind the extra relevance we give to certain food stimuli, leading to non-homeostatic feeding behaviors, such as overconsumption. To prove/disprove this hypothesis, the objectives of this project are to: 1. Create a workflow that can utilize a combination of behavioral video data and neuronal calcium recordings to draw correlations between the two. 2. Apply aforementioned workflow in the Insular Cortex alongside overconsumption task recordings to find subpopulations of neurons that are associated with this eating behavior. In the application of these objectives, we have been able to create a behavioral analysis pipeline that can track and learn from mice position data and attribute it to different behaviors. In using this behavioral data alongside neural activity recordings, we found a small subpopulation of excitatory neurons in the Insular Cortex whose firing times are correlated with eating behaviors, and whose amplitude of spiking increases preferentially for especially appetitive foods. In the future, these methods present a consistent way of being able to identify clusters in neuronal populations associated with different behaviors. Additionally, the insight gained in this application of these methods can help in the identification of therapeutic targets in reducing overconsumption behaviors.

Florida Atlantic University

Role of Cadmium Toxicity: A Critical Target in Oxidative Stress

Awab El Ghissassi & Darya Shirzad

Dr. Narasaiah Kolliputi

Cadmium, a heavy metal associated with manufacturing and construction as well as cigarette smoke, is a known human toxin and pervasive environmental pollutant. Exposure induces oxidative stress and inflammation from PANoptosis, which includes apoptosis, pyroptosis, and necroptosis. This inflammatory mechanism involves ROS overproduction, mitochondrial dysfunction, and cytokine release. This literature review aims to evaluate cadmium's impact on human health, focusing on its prevalence in cigarette smoke. Twenty-four sources were found on PubMed by filtering articles from 2019 to 2024 using keywords "cadmium toxicity", "cigarette smoke cadmium exposure", "PANoptosis", "ROS overproduction", and "cadmium-induced oxidative stress". The review found that chronic cadmium exposure induced ROS overproduction, leading to oxidative DNA damage, cellular dysfunction, and apoptosis in human cell models. Cadmium-driven autophagy was dual-faceted with low exposure driving protective mechanisms, while high exposure drove destructive apoptosis pathways. Chronic conditions including cardiovascular disease, cancer, diabetes, and neurodegenerative disorders, as well as skeletal and renal dysfunction were found to be caused by these mechanisms. Liver and kidney cells were especially vulnerable as these organs' metallothionein defenses were overwhelmed by chronic exposure. Cadmium was also implicated in neurotoxicity, causing neurodegeneration through disruption of oxidative and inflammatory pathways. The findings of this review highlight cadmium's role in mechanisms of oxidative stress and their impacts on human health. Despite cadmium's classification as a carcinogen, its impacts on many aspects of human health are not fully understood. Further research into the specifics and extent of cadmium's mechanistic role in oxidative stress is needed for potential therapeutic strategies.

University of South Florida

Assessing Parental Perceptions of Vulnerability Related to Cancer Treatment Type within Caregivers of Pediatric Cancer Survivors

Ayisha Cardenas

Dr. Marilyn Stern

Treatment type has been linked to differences in stress and mental health concerns among caregivers of pediatric cancer survivors (PCS), but little research has focused on parental perceptions of vulnerability (PPV). This study aims to assess the relationship between PPV and the treatment type received by PCS. Survey data were collected from 91 caregivers of PCS. Participants completed an adapted Child Vulnerability Scale (CVS) and a treatment type questionnaire where caregivers indicated the cancer treatment (Chemotherapy, Surgery, and Radiation) their child received. The CVS measures parental perceptions of their child's health and the degree they view their child as vulnerable. A multiple linear regression was performed to examine the relationship between cancer treatment type on PPV. A Bonferroni adjustment was applied to mitigate the risk of Type I errors, resulting in a p-value of .017. The participants were predominantly female (94%), 41% White, and 36% reported a household income of <$70,000, with an average age of 39.62 (SD=8.25). The obtained R2 value was .114, indicating about 11% of the variance of PPV was accountable by the set of predictors. The regression coefficient for chemotherapy (t (87) = -2.94, p=.004) was found to be statistically significant. Chemotherapy was associated with higher PPV among caregivers of pediatric cancer survivors (PCS). These findings highlight the need for development of strategies to help alleviate PPV for caregivers of PCS. Further research should investigate the factors contributing to higher PPV associated with chemotherapy.

University of South Florida

Possible Treatment from the Deep: Effects of Padina gymnospora, Marine Algae, on Breast Cancer Cells.

Aysel Khalil

Dr. Kimberly Dobrinski

Breast Cancer is the second leading cause of death among women in the U.S after skin cancer. As many women struggle through chemical and invasive treatments, science has started to shift its focus onto new approaches to help breast cancer patients. The goal of this research is to increase understanding of breast cancer therapies from our natural world and introduce the possible treatment of breast cancer by using marine brown algae found in Tampa Bay. This research used two breast cancer cell lines, which represent two different types of cancer cells: MCF-7; mirrors non-resistant cancer and MDA-MB-23; mirrors resistant cancer. Padina gymnospora has been evaluated for its anti-cancer activity and found statistically significant results on different types of cancer cells, however it remains unclear whether these results

have significant effects on breast cancer cell lines. This research has utilized Padina gymnospora treatments on cells under three different assays: Cytotoxicity assay (CYQUANT), Scratch assay, Peroxide assay. Additionally, these assays provided statistical analysis of the effect of P.gymnospora on breast cancer cells that will allow us to identify specific proteins that could be linked to these types of cancers by using RNA sequencing. Therefore, Padina gymnospora may be used as an alternative treatment for breast cancer patients.

University of Tampa

Master Protocols in Vocal Biomarker Development to Reduce Variability and Advance Clinical Precision: A Narrative Review

Ayush Kalia

Dr. Yael Bensoussan

Vocal biomarkers, defined as acoustic or linguistic features derived from voice samples, are emerging as a transformative tool in medical diagnostics due to their noninvasive nature and accessibility. These biomarkers leverage machine learning and artificial intelligence to detect and monitor conditions ranging from respiratory conditions to cognitive disorders. Despite their potential, a lack of standardization in data collection and analytical methods has hindered their clinical implementation. Current studies vary significantly in recording devices, recording mediums, and feature extraction techniques, making cross-study comparisons and data pooling challenging. This narrative review examines proposed master protocols for vocal biomarker development, focusing on their key components and evaluating their capacity to address these inconsistencies. By analyzing existing literature, this study identifies gaps in the proposed frameworks and highlights recommendations essential for creating a robust and comprehensive protocol. Insights are drawn from protocols for other digital biomarkers and clinical trials, emphasizing practices that reduce variability and ensure clinical applicability. In addition to reviewing the existing approaches, the study considers guidelines suggested by regulatory bodies like the FDA and organizations such as the Digital Medicine Society (DiMe). These recommendations provide critical steps for validation and implementation, which are vital for establishing vocal biomarkers as a reliable tool in clinical settings. The findings of this review aim to inform future efforts toward standardizing vocal biomarker research and development, advancing their role in clinical medicine and ensuring their integration into broader healthcare frameworks.

University of South Florida

BabyMic: A Novel Wireless Device for Non-Invasive Monitoring of Infant Dysphagia

Baylor Reid

Dr. Juan Aceros

Dysphagia, a swallowing disorder characterized by difficulty processing food and liquid through the oral cavity, pharynx, esophagus, or gastrointestinal junction, presents significant challenges in diagnosis and management, especially in infants. Due to their inability to communicate symptoms and their small size, detecting dysphagia in infants requires specialized tools and methods that are both precise and non-invasive. Current diagnostic approaches, such as clinical observation and imaging, are difficult to implement in this population and are limited in real-time monitoring capabilities.

We propose the development of BabyMic, a wireless, patch-mounted respiratory monitoring device designed specifically for infants. Positioned on the carotid triangle, BabyMic monitors key physiological parameters such as heart rate (HR), respiratory rate (RR), blood oxygen saturation (SpO_2), and acoustic signals related to swallowing and respiratory events. The device was designed using the NRF5340 microcontroller, MAX30102 Pulse Oximeter, LSM6DSV16BX 6-axis IMU, and MP34DT05-A digital microphone. The device employs two custom PCBs to house all electronic components in a compact package. BabyMic is designed to be low-power and unobtrusive, offering continuous, real-time monitoring of respiratory and swallowing activity. Its Bluetooth capability allows for wireless data transmission to healthcare professionals, enabling remote monitoring and simultaneous tracking of multiple patients from a central location.

BabyMic's ability to track both respiratory and acoustic data provides a comprehensive approach to identifying and monitoring dysphagia in infants, allowing for early detection and timely intervention.

University of North Florida

‘Feathers that Make the Wing’ The Compositional Devices of Tchaikovsky’s ‘Swan Lake’

Bella D. Pantfoeder

Shannon Lockwood

Within days of completing his Third Symphony, Pyotr Tchaikovsky began work on scoring a ballet that would change the genre. this study explores the compositional and aural devices deployed in Tchaikovsky’s ‘Swan Lake,’ creating an audio-visual connection to the story that is ‘Swan Lake’. The initial performance of the ballet was noted as a failure with complaints of the scoring being ‘undanceable,’ causing Tchaikovsky to change his process of composing his later ballets. Choreographers Marius Petipa and Lev Ivanov took the score and created one of the most performed ballets today. Through the use of the iconic oboe leitmotif and characterization defined by key area and rhythm, Tchaikovsky created an aural association between the characters on stage and the compelling story being told by the music. This research explores how Tchaikovsky used thematic material and transformation with examples such as Odette’s theme and her transformation from swan to princess, comparing the supporting roles of the Corps de Swans and the Royalty regarding the main plot, and the influence of Baron von Rothbart’s thematic material on the themes of key characters. Together between the musical story created by Tchaikovsky and the compelling dances created by later choreographers, a deep connection between the audience and art is created.

Jacksonville University

Examining Gender Differences in Financial Risk Tolerance and Attitudes Toward Economic Security

Benjamin Friedman

Dr. Monica Escaleras

Research shows that men and women often have differing levels of economic education, shaped by societal expectations and disparities in financial exposure. Men tend to encounter financial concepts earlier and more thoroughly, building confidence in handling financial risks. In contrast, women, who may receive less formal economic education, often adopt more conservative financial approaches, prioritizing stability over risk, especially during economic uncertainty. Observing these gender differences in financial attitudes around me, I became interested in examining if these patterns held true on a broader scale. My goal was to explore how gender impacts attitudes toward economic stability and investment risk and to investigate if educational differences in gender contribute to this divide. Data was collected via Amazon Mechanical Turk, with 153 participants answering questions about their willingness to invest in volatile markets and perceptions of financial security. I hypothesized that men would show a higher tolerance for financial risk, while women would prioritize economic security. The results confirmed my hypothesis with the data being statistically significant at the 1% level. The findings confirmed this, with 31.1% of men displaying high levels of willingness to investment risks while only 12.7% of women display those same risky investing styles. These findings highlight the need for financial literacy programs that address gender-specific needs, helping to close educational gaps and support informed financial decision-making for people of every gender.

Florida Atlantic University

Differences in Prefrontal Cortex Activation During Risk and Ambiguity Aversion

Bhargav Vyas & Milena Alvarado Giler

Dr. Nichole Lighthall

A risky decision is one made under known probabilities, whereas an ambiguous decision is one made under unknown probabilities. The degree to which a person is risk averse can be measured using the General Risk Propensity Scale (GRiPS). Similarly, ambiguity aversion can be measured using the Multidimensional Attitude Toward Ambiguity Scale (MAAS). Neuroimaging literature is conflicted on the specific prefrontal cortex (PFC) mechanisms behind ambiguous and risky decision making. The current study uses functional near-infrared spectroscopy (fNIRS) to determine if there are differences in hemispherical PFC activation for people who display high ambiguity aversion compared to those who display high risk aversion. The study also compares general neural activation in participants who display both high ambiguity and high risk aversion to participants who display neither. It is hypothesized that participants who display only high ambiguity aversion will display different hemispherical PFC neural activation compared to participants who display only high risk aversion. It is also hypothesized that participants who display both high ambiguity and high risk aversion will display different hemispherical PFC neural activation when compared to participants who display neither. The regions of interest expected to exhibit greater neural activation are the Ventrolateral PFC (BA: 44,

45, 47), frontal eye fields (BA: 8), Dorsolateral PFC (BA: 9, 11) and the frontal lobe (BA:10).

University of Central Florida

Impact of Racial Representation in Mental Health Advertisements

Bianca Beliard

Danielle Jones

Historically, minorities were rarely portrayed in the media, and when they were, it was commonly in roles portraying negative stereotypes (Henderson & Baldasty, 2010). Present day research has indicated that advertisements featuring Black models were evaluated more favorably by Black individuals and were evaluated equally to those featuring white actors by white individuals (Appriah, 2001; 2002). To explain these findings, other studies have shown that individuals are more likely to engage positively with an advertisement they can personally identify with (Meyers-Levy & Peracchio, 1996). Considering the continued underrepresentation of minorities in present-day research, it is vital to develop strategies to increase the diversity of our samples. The present study evaluates the performance of Meta advertisements for an online mental health study that feature actors of different races. 3,844 potential participants completed a screening questionnaire linked to an advertisement (randomized which version was shown), and a one-way ANOVA ($F(3,3840) = 9.685$, $p < .001$) indicated that versions featuring a Black actor performed significantly better at attracting Black individuals that did versions featuring white ($\Delta = 0.098$, $SE = 0.026$, $p = .001$), Asian ($\Delta = 0.126$, $SE = 0.026$, $p < .001$), or animal actors ($\Delta = 0.089$, $SE = 0.025$, $p = .002$). Results for other races and implications for future research recruitment designs will be discussed.

Florida State University

Investigating Localized Corrosion-Induced Cracking in Reinforced Concrete Structures

Bibhuti Regmi

Christopher Alexander

Corrosion of steel reinforcement in concrete is a leading cause of structural degradation, driven by the expansive pressure generated by corrosion products. Stainless steel, with its enhanced corrosion resistance and localized corrosion behavior, presents a potential alternative to carbon steel for mitigating such damage. However, the shift from uniform corrosion in carbon steel to localized corrosion in stainless steel introduces an alternative damage modality—either corrosion-induced cracking or corrosion-induced mechanical failure.

To better understand these phenomena, accelerated corrosion experiments are combined with corrosion-induced cracking models to investigate the failure mode under conditions of highly localized corrosion. Mechanical testing of corroded reinforcement provides data on the relationship between the extent of corrosion and the stresses required to cause reinforcement failure. The results are compared to the amount of corrosion product accumulation needed to induce surface-level cracks in the concrete.

The modeling approach simulates the effects of localized pressure buildup on stress-strain distribution, capturing the development of stress concentration zones and their role in crack propagation. These simulations deliver detailed insights into the mechanics of localized corrosion and its influence on structural deterioration.

The findings underscore the critical impact of stress concentrations at the steel-concrete interface and the distinct failure mechanisms associated with stainless steel reinforcement.

University of South Florida

Dental Ontogeny and Allometric Scaling as Evidence for Paranthropus Monophyly

Braedon Farkas

Dr. Geoffrey Thomas

The evolutionary relationships within the Paranthropus genus remain a central question in paleoanthropology, with ongoing debates surrounding its monophyly. Paranthropus is known for their large craniofacial morphology and derived characteristics. This study utilizes dental ontogeny and allometric scaling to investigate whether the robust australopiths—P. Aethiopicus, P. boisei, and P. robustus-form a monophyletic clade. The central hypothesis of this study is that dental ontogeny is crucial to understand the origins and evolutionary development of the genus Paranthropus and its monophyly. By analyzing ontogenetic development in dental structures, this research aims to identify shared developmental patterns indicative of a common ancestor. This study takes 3-D scans of hominins and superimposes the morphological traits into an x, y axis using Procrustes superimposition. The Procrustes coordinates of the landmarks are analyzed further using principal component analysis, which is then measured with allometric trajectories using multi variate linear regressions. The results are then compared with allometric analyses of extant primates. Leveraging

allometric scaling, which examines proportional growth across related taxa, this study evaluates whether the derived traits of robust australopiths represent homologous adaptations rather than independent evolutionary responses to similar environmental pressures. Integrating insights from recent phylogenetic studies, dietary analyses, and morphological comparisons, the findings will contribute to understanding the evolutionary pathways that shaped the Paranthropus lineage. This research reaffirms the significance of dental ontogeny as a robust data source for unraveling the complexities of hominin phylogeny.

Florida State University

Maternal Health in Crisis: Addressing the Impact of Conflict on Pregnancy and Childbirth Outcomes

Brandon Lopez

Nazek Jawad

Maternal health in conflict-affected regions faces profound challenges, marked by disrupted healthcare systems, limited access to essential services, and heightened risks during pregnancy and childbirth. This project aims to explore the multifaceted impacts of conflict on maternal health outcomes, focusing on key factors such as availability of skilled birth attendants, access to antenatal and postnatal care, and the prevalence of preventable maternal complications. Employing a mixed-methods approach, the study will combine quantitative data analysis of maternal mortality and morbidity rates in conflict zones with qualitative insights from healthcare providers and affected women.

The project will assess the effectiveness of existing interventions, including mobile health units and international aid programs, and propose scalable, culturally sensitive solutions to mitigate maternal health risks in these settings. By addressing structural and systemic barriers, the study seeks to inform policy development and humanitarian practices that prioritize maternal health in fragile and conflict-affected areas, ultimately contributing to improved health outcomes for women and newborns in vulnerable populations.

University of South Florida

How Public Figures Play a Controversial Role in Political Campaigns

Brianna Avrilien

Akeemia Clements

In the digital age, powerful public figures can shape public opinion and political discourse in ways previously not possible. Because of massive social media followings, public figures can endorse candidates and play a huge role in voter turnout, boosting a candidate's legitimacy, and even influencing election outcomes. Public figure's involvement can bring positive attention and engage certain voter groups, but it also comes with risks, such as backlash, ethical concerns, and the potential to distort political conversations. This research delves into the complex role public figures play in political campaigns and highlights the importance of understanding and evaluating their influence by using their platforms like social media, media appearances, and public endorsements to sway public opinion and support political candidates. For candidates, having the endorsement of a celebrity with a loyal fan base can elevate their profile and attract more attention, especially among younger voters. The study uses qualitative research methodology and drawings on the cultivation theory, to reveal how public figures leverage their star power to mobilize voters, raise awareness, and even secure campaign funding. However, the findings also show that this influence isn't without controversy that public figures can have a significant and positive impact such as encouraging people to vote and shedding light on important issues. Public figures hold the potential to drive meaningful engagement, but they also bear the responsibility of using their influence thoughtfully and ethically, keeping public trust in mind.

Bethune-Cookman University

Comparative Analysis of Recycled PET and HDPE Filament Production Using Pultrusion for Sustainable 3D Printing

Brinley Jordan

Nancy Diaz-Elsayed

As plastic waste continues to pose significant environmental challenges, finding scalable, low-cost recycling methods is essential. In response, this research aims to evaluate the performance, sustainability, and economic feasibility of producing

3D printing filaments from recycled high-density polyethylene (HDPE) and polyethylene terephthalate (PET) using the pultrusion process. The primary goal is to develop 3D printing filaments from recycled plastic waste, specifically from post-consumer PET and HDPE plastic bottles, using a custom-built, cost-effective pultrusion machine. The mechanical properties, such as tensile strength, durability, and printability of the filaments, will be tested and compared. Additionally, a cost analysis will be conducted alongside a life cycle assessment (LCA) to evaluate the carbon footprint, energy consumption, use of life, and overall environmental impact of the production process. By evaluating the effectiveness of a low-cost solution rather than commercial machines, this research seeks to provide an accessible and sustainable solution for both small-scale users and industries, while promoting circular economy principles. Expected outcomes include a comprehensive understanding of the mechanical performance of HDPE and PET filaments, insights into the environmental benefits of recycled filaments, and a life-cycle cost analysis of using pultrusion as a viable recycling method. Ultimately, the research will contribute to reducing plastic waste and promoting more sustainable manufacturing practices through 3D printing.

University of South Florida

Towards Decolonizing Archival Collections: Promoting Access & Dialogue Through Online Subject Guides

Brittany Renee Marshall Davis

Joshua Bell

The National Anthropological Archives (NAA) and the Human Studies Film Archives (HSFA) are home to a vast and diverse array of collections that serve as important historical records of cross-cultural interactions spanning decades. This project delves into the imperative need for a subject guide for the NAA and the HSFA Central African collections to improve accessibility for Central African researchers. A subject guide enhances the discoverability of collections by organizing and sorting information into a cohesive document. It achieves this through the implementation of Indigenous geographical and cultural terminology in the index, thereby facilitating a more intuitive search process. Furthermore, the guide contextualizes historically offensive terms that are present in some collections, acknowledging their existence while actively rejecting their use. This method promotes a nuanced understanding of historical contexts while fostering sensitivity to the implications of language. This study aims to challenge colonial narratives and stereotypes, highlighting the significance of integrating diverse voices and community perspectives. To support this effort, contact information is strategically placed throughout the guide to encourage individuals to report any inaccuracies or omissions. This inclusive approach is essential for enhancing the accessibility of the collections. Through this exploration, the project aims to create more accessibility through a culturally sensitive museum subject guide for the Central African collections, fostering greater engagement and understanding.

State College of Florida

The Impact of Neutrophil Depletion on Aneurysm Healing

Brittney Chang

Dr. Brian Hoh

Intracranial aneurysms are weakened brain blood vessels at risk of rupture, often leading to subarachnoid hemorrhage, a condition with ~44% mortality (Bugazia et al., 2024) . A common intervention is endovascular coil embolization, inducing clot formation within the aneurysm sac. However, it often faces complications like recanalization, where partial reopening of the aneurysm results in incomplete healing and increased rupture risk (Tan et al., 2011). Inflammation is critical in this healing process, with neutrophils playing a key role in clearing damaged tissue. However, excessive neutrophil activity can weaken the aneurysm wall and hinder complete healing (Rosales, 2018).

This study investigates the effects of neutrophil depletion and granulocyte-colony stimulating factor (G-CSF) inhibition on aneurysm healing using the murine aneurysm model. Elastase-induced aneurysm was created and then a platinum endovascular coil was placed in the carotid artery of mice to mimic the effects of endovascular coiling. Mice received an anti-PNM antibody to deplete neutrophils or an anti-G-CSF antibody to inhibit neutrophil activation. Anti-PMN and anti-G-CSF were administered at set time points.

To assess effectiveness of intervention, we measured tissue ingrowth into the aneurysm and conducted cytokine arrays across three different coil types (a-CXCL1, IgG, PLGA), resulting in a trend toward improved tissue ingrowth in the anti-PMN group ($p = 0.06$) and significant improvement in the anti-G-CSF group ($p = 0.04$). The cytokine array revealed significant elevations, with G-CSF showing the most substantial increase due to its

crucial role in recruiting neutrophils and modulating inflammation. Findings suggest potential cell-targeted treatments for intracranial aneurysms.

University of Florida

How Social Interactions vary with Social Status in the Lance-tailed Manakin

Brooke Hagans

Dr. Emily DuVal

The Lance-tailed Manakin (Chiroxiphia lanceolata) is a Neotropical bird species inhabiting tropical dry forests and open areas in Panama and Colombia. This species exhibits cooperative courtship, where dominant (alpha) and subordinate (beta) males perform synchronized displays at lekking sites—specific locations where males gather to attract females—with only the alpha copulating. Males birds of this species undergo delayed plumage maturation, transitioning through two subplumages before reaching adult status. Social interactions, which occur across all male statuses, may influence status transitions, such as subadults ascending to dominant or subordinate roles, or adults maintaining their dominance. Utilizing 10 years of social interaction data from Panama, we examined two hypotheses: (1) subadults engage in social interactions to increase their chances of obtaining a higher social status, and (2) adults rely on social interactions to maintain their current status.Preliminary analyses indicate that adults and subadults engage in interactions with more social partners than subordinate and marginal adult males. This pattern aligns with both hypotheses, suggesting that increased social interactions may play a role in maintaining or enhancing social status. However, while these interactions are correlated with male status, we are not yet evaluating whether such interactions directly lead to status transitions. This study represents an initial step toward understanding this relationship, with future research aimed at determining whether the frequency and nature of these interactions influence status changes over time.

Florida State University

The impact of Mass Media on the Hyper-Sexualization of Adolescents

Brooklyn Pitre

Dr. Akeemia Clements

This study examines the hyper-sexualization of adolescents in mass media and its impact on the way young people see themselves, their relationships, and their understanding of sexuality. Mass media can offer positive affirmations and diverse representations. Still, it often perpetuates harmful stereotypes such as sexualized imagery, unrealistic beauty standards, and the manipulation of sexuality, which contribute to mental health challenges and distorted perceptions of relationships among adolescents. This research project examines how various forms of media like television, movies, music, social media, advertising, and video games shape young people's views on gender and sexual identity. The study emerges with the idea that hyper-sexualization refers to the way mass media normalizes sexualized imagery, which can significantly affect adolescents' mental health, body image, and sense of self. Using a qualitative research methodology and applying the cultivation theory, this study uncovers several ways mass media contributes to this phenomenon. Early findings show that this issue fosters disconnection, glamorization, and a range of negative implications for adolescents. The portrayal of young people in mass media often reinforces unhealthy ideas about body image and relationships, making it harder for adolescents to develop a realistic and healthy sense of self. Engaging in open conversations with adolescents about media literacy, body image, and healthy relationships can help counteract the harmful effects of hyper-sexualization. By fostering awareness and education, can empower young people to navigate media messages more critically and cultivate healthier perspectives.

Bethune-Cookman University

Complex Emotions in Facial Expressions: Complex Emotional Expression Database Emotionality Ratings and Predictive Models

Bryce Romero & Emily Rancorn

Dr. Geoffrey Potts

Emotion research is a vast area of psychology, encompassing a diverse range of topics. One method that plays a crucial role in studying emotion in a social context is the use of facial stimuli. The Complex Emotion Expression Database (CEED), a database which aims to provide face types that disclose expressions for more specified social-interactions in emotional facial recognition research. The CEED face types attempt to capture a wider range of facial expressions to better reflect typical social interactions and emotional expression. However, normative emotional ratings appear to be missing from the current literature. One of the most reliable and useful tools for the rating of a various types of stimuli, including facial stimuli, is the Self-Assessment Manikin (SAM). Providing a pictorial, non-verbal scale for assessing valence, arousal,

and dominance. Most emotion research, however, rarely incorporates dominance as a dimension, instead focusing on valence and arousal as more reliable measures. A total of 152 undergraduate participants used the SAM scale to measure emotionality on dimensions of valence and arousal for a subset of CEED facial stimuli. Thirty pictures from the CEED database were used with 7 face types (contemptuous, disgusted, betrayed, happy, affectionate, brokenhearted, and lovesick) selected. This study reports average valence and arousal scores for these face types. Statistical models also identified outliers and predicted categories for face types. These current CEED ratings and models could support future studies in emotional recognition using the database, possibly enhancing ecological validity with more specified social face types.

University of South Florida

The Innovations of Thermodynamics in Stretchable Materials and Systems

Bryce Sinift & Christopher Oshman PhD, PE

The field of stretchable materials for thermal regulation is rapidly advancing, particularly in industries such as stretchable electronics and heat exchangers, which are highly desired in biomedical engineering. There are multiple ways to create stretchable materials, including using a polymer matrix, traditionally flexible materials like PDMS, or fabricating metals to allow for elastic deformation.

There is a distinct difference between flexible and stretchable materials. For example, a sheet of printer paper can bend around a surface but cannot elastically deform under strain.

Applications of stretchable materials in the biomedical field include thermoregulation, body heat harvesting, and cooling of wearable electronics. These systems can cover irregularly shaped objects, such as an arm or a baby's back, which gives them value in the biomedical space. In conclusion, stretchable systems can innovate soft robotics, production, and medical fields and be used in daily life.

University of North Florida

The role of Crocus sativus (Saffron) in reducing migration and Invasion of Breast cancer cells through modulation of MMPs

Burhaan Toor & Andy Holtery

Fatima Rehman

Metastasis is the primary cause of cancer-related mortality, claiming numerous lives annually. Two key processes in metastasis are cancer cell migration and invasion. Crocus sativus (Saffron) with established anti-cancer properties, also shows promise in inhibiting these processes. However, studies investigating saffron's effects on the metastatic potential of cancer cells remain limited. This study aimed to investigate the impact of saffron on the migration and invasion of breast cancer cells. We hypothesized that saffron treatment would significantly reduce the migratory capacity of cancer cells. Migration and invasion were assessed in MDA-MB-468 human breast cancer cells using a scratch wound assay in the presence of varying saffron concentrations. Protein extracts from cells treated with 0–1000 µg/mL saffron were collected at time points ranging from 0 to 72 hours. Zymography was performed to evaluate the activity of matrix metalloproteinases (MMPs), particularly MMP-2, which is critical in extracellular matrix degradation. Results were further validated through Western blot analysis. The scratch wound assay demonstrated a significant reduction in cell migration and invasion following high-concentration saffron treatments. Zymography revealed a decrease in MMP-2 activity in saffron-treated cells, although results varied with time. These findings suggest that saffron effectively inhibits breast cancer cell migration and invasion, potentially through MMP-2 downregulation. Future studies will focus on further characterizing the molecular pathways involved, including additional Western blot analyses targeting proteins linked to cancer cell motility and invasiveness.

University of North Florida

FOS Expression in Respiratory Motor Networks After Cervical Spinal Cord Stimulation and Injury

Caitlin Brennan

Dr. Erica A. Dale

Cervical spinal cord injuries (cSCI) diminish an individual's ability to breathe, often leading to

respiratory failure and ventilator dependence. Our lab uses closed-loop epidural stimulation (CL-ES) to restore breathing after cSCI by delivering short trains of stimulation during respiratory effort based on diaphragm EMG activity. Previous work demonstrated that this approach restores ipsilesional diaphragm EMG activity in rats with C2-hemisection (C2HS) (Mickle et al., 2024). However, the neural populations activated by stimulation remain unknown. This study investigates stimulation and injury-induced changes in neuronal activity in respiratory motor networks using expression of FOS, a transcription factor associated with increased neural firing. We assessed FOS expression at C4, the stimulation site, and T4, a distal respiratory motor pool isolated from direct stimulation. Rats underwent C2HS or were left intact before receiving EMG-triggered stimulation or sham treatment. Tissues were sectioned and stained for FOS mRNA via RNAScope. At C4, stimulation increased gray matter FOS positivity in both injured and intact rats but did not affect overall FOS positivity. Work is ongoing to colocalize FOS positive cells with various neural markers to identify a population of neurons necessary for stimulation-induced increases in diaphragm EMG. At T4, C2HS elevated gray matter FOS positivity, suggesting injury-induced compensatory neuronal firing. Stimulation decreased white matter FOS positivity in hemisected rats, while in intact rats, white matter positivity relative to gray increased with stimulation. These findings suggest CL-ES influences neuronal activity in respiratory motor networks after cervical SCI, with distinct effects at local and distal spinal segments.

University of Florida

Unreal Engine 5 for Synthetic Dataset Creation

Caleb A Fernandes & Justin McMillen

Dr. Yasin Yilmaz

Semantic segmentation is a subfield within computer vision that deals with the classification of objects within an image. In order to accurately identify images, the segmentation models must be trained on images that have already been color-coded with their respective objects. This is known as labeled, ground truth data. The issue with this is that labeling images must be done manually which takes a vast amount of time. This research proposes the use of Unreal Engine 5, a video game creation software, in order to synthetically create and label datasets, thus eliminating the need to manually label images and reducing time. To increase diversity, we used a virtual landscape equipped with different biomes and tested the images on our segmentation model. Furthermore, due to the sophistication of Unreal Engine, we are incorporating a depth modality to the dataset. After training on synthetic data, the segmentation model can then be applied to real-world data. The results of the dataset on our model are sufficient to prove that using synthetic data is a viable option for training and can eliminate the need for manually labeling datasets.

University of South Florida

Image Segmentation via Role Extraction with Neighborhood Pattern Similarity Measure

Caleb Stewart

Yue Shen

Image segmentation is a fundamental task in computer vision, aiming to parse an image into meaningful objects or regions. However, many traditional methods are often overly rigid or prone to over-segmentation, motivating the exploration of alternative approaches. In this project, we propose a novel approach to image segmentation using role extraction. Role extraction takes a collection of connected nodes, called a network, and simplifies it into a smaller structure, grouping similarly behaving nodes into roles. To find these roles efficiently and effectively, we use a similarity measure called the neighborhood pattern similarity measure (NPSM). The first step of this process is to create a network directly from our image of interest. This network is represented as a matrix to which the NPSM is applied. We then group the nodes into roles with a clustering algorithm called k-means++ clustering. Lastly, we reconstruct the original image by assigning pixel colors based on their role assignments. Preliminary results suggest this technique has the potential to precisely segment images into minimal groups. These results extend the use of role extraction to image segmentation and reinforce the utility of NPSM as a similarity measure. By simplifying segmentation, this technique could provide a new approach to image segmentation, a process with widespread industry usage.

Florida State University

Extracellular Vesicles with Mitochondrial and Viral content induce Myocarditis

Cameron Hartmoyer

DeLisa Fairweather

Objective: Viruses are known to target mitochondria and be released in extracellular vesicles (EVs) that contain whole or components of mitochondria

as well as replicating virus and replication defective viral particles. The objective of this study is to determine whether these EVs, which we have named 'Mitopods' are able to active the immune response and induce myocarditis. Methods: We isolated Mitopods from the heart of BALB/c mice and sent samples for transmission electron microscopy (TEM) to assess EV structure, microRNA (miR) sequencing, and proteomics. We performed high resolution microscopy (dSTORM) to visualize mitochondrial and viral components within individual EVs. We counted the number and size of EVs using an Exoid. We infected male BALB/c mice with 1010 EVs intraperitoneally and assessed myocarditis at day 10 after injection compared to positive and negative controls. Results: TEM revealed vesicles with outer membranes visualizing EVs. dSTORM revealed that EVs contained VP1 of the virus and outer mitochondrial membranes and respiring mitochondria (TOM20, total OXPHOS). Plaque assay showed the EVs contained replicating virus. Western blot revealed EVs contained EV tetraspanin CD9 and inner mitochondrial membranes (COX IV). We found that Mitopods were able to induce myocarditis in male and female BALB/c mice at day 10 but the severity was significantly lower than the viral stock ($p=0.015$). Conclusions: These data provide a possible explanation for how mRNA vaccines could induce myocarditis.

University of North Florida

Examining wildfire survivorship & post-fire metabolism within forest soil microbiomes

Cameron Johnson

Joseph Vallino

Wildfires are widely known to cause widespread destruction in forest ecosystems, claiming the lives of many plants and animals while clearing massive tracts of forest. There have been extensive studies conducted on the post-fire succession of both the flora and the fauna of forests, with many plant and animal species being dubbed "pioneer species". Less often considered is the forest's soil microbiome, which persists in burned areas even when plant and animal life do not. The question of how soil microbiomes enable plants and animals to return to a previously uninhabitable ecosystem then arises. Understanding the survivorship rates and the shifts in metabolism of the soil's inhabitants facilitates understanding of the factors that set the stage for plant and animal life to later return to burned ecosystems. To observe the survivorship and metabolism of burned soils, samples of varying burn intensities from a recently burned forest underwent a series of tests. Among the data gathered was Carbon and Nitrogen load, microbial/fungal community composition, pyrogenic Carbon concentration, soil respiration, and Microbial/fungal community metabolism. From this data, trends highlighting microbial traits that possibly confer wildfire survivorship start to take shape. The ecological roles in wildfire succession played by these surviving microbes and fungi also become clearer with the data collected. Further directions will see more extensive testing of the samples from a molecular lens, aiming to uncover the very genes that underpin the observed shifts in microbial metabolism and wildfire survivorship.

Bethune-Cookman University

Advancing Socket Design for Customizable Myoelectric Prostheses: Enhancing Comfort and Fit through Innovative Techniques

Cameron Stott

Dr. Albert Manero

Rejection rates for upper limb myoelectric prostheses remains high at 35% (Biddiss & Chau, 2007). Among factors leading to abandonment, the comfort of the interface between the user and their device is a major point of concern (Biddiss et al., 2007). To address such concerns, this research outlines the development and improvement process of these interfaces, for a customizable myoelectric prosthesis socket.

This research laboratory's preliminary socket designs were limited to diameter and length alone without consideration of irregular topologies that naturally occur with limb difference. The need for an improved approach capable of accommodating each participant's limb is evident and has now been implemented. Various photos and videos of the residual limb are taken to develop an accurate 3D model, from which a custom interface can be generated. Features including electrodes, a battery adapter, and an adjustable tension dial to accommodate fit are then added. To improve socket fit and comfort, components such as the gel electrodes have been replaced with dry counterparts for enhanced signal reading and ease of placement. Previously inaccessible by gel electrodes, dry electrodes provide direct access to target muscles.

Additional methods for development are being considered for future implementation in the process. For increased efficiency within the creation of sockets, a 3D scanner and casting methods are being explored for the generation of residual

limb models. By integrating these findings into the user interface this research seeks to improve comfort and lower the rejection rates of upper limb prosthesis.

University of Central Florida

The Relationship Between Religious Importance, Religious Affiliation, and Meaning Presence

Camila Foy

Dr. Jay L. Michaels

This study explores the relationship between religious importance, religious affiliation, and meaning presence. Methods include a nationwide survey of 255 participants (35.9% Christian, 39.2% no religion, 59.4% male, and 38.7% female), which was narrowed to 212 participants, exclusively including Christians, Agnostics, and individuals with no religious affiliation due to insufficient representation of other religious groups. The results suggest a significant positive correlation between Christianity and the emphasis on religious importance in meaning presence, with religious importance among Christians having a 4.5% effect on in meaning in life presence. However, this correlation was absent in Agnostics and those with no religious affiliation. These findings posit that religious beliefs, particularly within Christianity, play a unique role in amplifying meaning presence, and this relationship does not extend to nonreligious or Agnostic individuals. This study contributes to understanding how religious identity and perceived importance of faith influence the presence of meaning in life.

University of South Florida

Using Remote Sensing to Identify Seagrass Scars

Caralise Maloy

Gerardo Toro-Farmer

Seagrass scars are residual damage left from boating accidents that disturb and tear seagrasses from the sand or mud. This leaves them vulnerable to erosion and damage.

This study investigated how remote sensing can be used to identify and quantify seagrass scars. Images were collected via drone imaging at Lido key, and then GIS was used to process them. Specifically, mosaics and rasters were created and then trained sample managers and supervised classification wizards were used to identify seagrass scars from those rasters. Overall seagrass identification is possible through remote sensing. However, there are some limitations that need to be worked out. There were varying levels of success between images, depending on glint and turbidity. Due to how abundant boating in Florida is and the prevalence of this vulnerable habitat, being able to quantify damage over time is important to implement damage reduction and to track habitat degradation.

New College of Florida

Algal Innovations: An Integrated Review with Insights into Bioremediation and Bioproducts

Carlos P. Luzuriaga & Kelly Jatib

Schonna R. Manning

Algae, including cyanobacteria, are versatile, photosynthetic organisms that are central to diverse biological and ecological roles. Further, many strains of algae possess desirable physiological and biochemical characteristics that are being exploited for various applications, from bioproducts to bioremediation. Mainly known for research in biofuel production, algae offer a promising alternative to fossil fuels. However, scaling production remains a challenge, impacting profitability and decreasing consumer interests. Applications in the food sector have also emerged with algae as a potential superfood. Certain strains possess potent antioxidant compounds and contain high amounts of protein, making algae a valuable addition to human and animal diets, catering to shifting consumer preferences, and aligning with trends toward plant-based proteins. In the realm of biopolymers, algae can be utilized as an eco-friendly alternative to conventional plastics with successful commercialization in various industries, including footwear and surfboard foams. There is also immense interest in algae for bioproducts with metabolites fetching premium prices for use in cosmetics and pharmaceuticals, effectively maintaining high demand. Their role in bioremediation is particularly noteworthy, offering point and non-point treatment solutions for water and air pollutants. Diverse applications of algae are presented here with an emphasis on their role in developing sustainable technologies for the future. By addressing challenges such as scalability and cost-effectiveness, this review aims to provide a more comprehensive understanding of algae's multifaceted applications as well as demonstrate their potential in pioneering novel environmental and economic advancements.

Florida International University

Generation of Model of Obesity in Zebrafish

Carlos Vazquez

Dr. Kimberly Dobrinski

Obesity is a global epidemic linked to numerous diseases, including Nonalcoholic Fatty Liver Disease (NAFLD) and Type 2 diabetes. Recent research suggests that copy number variations (CNVs), defined as the loss or gain of copies of DNA segments within the genome, has been associated to these obesity related diseases. However, the role of obesity as a potential cause of CNV formation has not been previously investigated. This study uses zebrafish (Danio rerio), a model organism, to explore how obesity may contribute to the formation of disease-causing somatic mutations. Zebrafish share 70% of their genes with humans, including 84% of disease associated genes. Over eight weeks, 12 zebrafish were divided into control and experimental groups. The control received a normal diet of 6 mg of frozen artemia daily, while the experimental group were fed a high-fat diet of 60 mg daily. Weekly BMI calculations were carried out to monitor obesity development. At the end of the study, the fish were euthanized with tricane methyl sulfonate and sodium bicarbonate. Livers were dissected and sent off for Next Generation Genomic Sequencing, RNA-seq, and Bisulfite Methylation Sequencing to investigate CNV formation and CNV effects on gene transcription. These findings will provide insight into how these genetic alterations contribute to liver specific diseases. Future studies will further utilize this obesity model to explore how CNVs affect gene expression and their relationship to obesity related diseases.

University of Tampa

The Perpetuation of Rape Culture in Lisa Wartenberg Vélez's "What is Ours"

Carly Smith

William Pewitt

Lisa Wartenberg Vélez's short story, "What is Ours," critiques the perpetuation of rape culture by exposing societal complicity and denial surrounding sexual violence. The narrative juxtaposes a family's denial of a beloved uncle's sexual violence with the narrator's refusal to excuse or forget his crimes. The contrast emphasizes how silence and moral rationalizations normalize and sustain such offenses. Through the family's celebration of the uncle's religious redemption and the simultaneous erasure of his victim, the narrative exposes broader societal structures that prioritize male rehabilitation over justice and healing for survivors. Their refusal to confront complicity, instead reframing the uncle's actions as part of a redemptive arc, reveals the mechanisms that sustain this culture of denial. Moreover, added interludes of a sinister retelling of "Little Red Riding Hood" deepen the critique, revealing how cultural narratives perpetuate gender stereotypes and trivialize violence against women. By subverting familiar tropes, the story portrays the Huntsman as a false savior, dismantling the expectation of male protection and exposing how narratives often shift blame onto victims while excusing or valorizing predators. By intertwining this retelling with the family's moral rationalizations, "What is Ours" highlights the dangers of normalized narratives and their role in sustaining systemic violence. The analysis underscores the need to confront the cultural silence that perpetuates rape culture, calling for a reevaluation of the stories society preserves and passes down. Vélez's work contributes to broader discussions on dismantling harmful cultural narratives, advocating for accountability and justice while fostering greater empathy and societal awareness.

University of North Florida

Learning Psychology Through Games

Carlye Waterman, Kaen Freeman, Lori Jacques & Stephen Blessing

Stephen Blessing, Lori Jacques

We created a card game to be used as a study tool in the introductory psychology course. Card games are an effective way of getting people to work together as well as providing meaningful engagement. In this game, players elaborate a scenario using psychological concepts. In a round of the game, players draw a scenario, such as one describing a situation where a friend is having trouble sleeping. Players then take turns playing some number of concept cards from their hand (e.g., "REM Sleep," "Memory," "Continuous Reinforcement"— players have 7 such cards in their hand) they believe may help in either addressing the current scenario or in playing off a previous player's narrative. They then elaborate on why that card may be helpful within the scenario. We developed two versions of the concept cards, one definitional in nature, the other more humorous. Participants played the card game in a lab in groups of 4, providing feedback via a questionnaire after playing the game for 8 rounds. Participants agreed the game could be a beneficial study tool and a way to learn the concepts' application. Participants found the definitional deck to be more beneficial when it came to learning the concepts. While participants seemed to enjoy the use of the

humorous deck more, most also thought that this deck would be useful when it came to testing their knowledge after having learned the concepts prior. We also performed a qualitative analysis of the conversations participants had while playing the game.

University of Tampa

Morphometric Analysis of the Human Jaw Through Time and in Relation to Dental Health

Carmela Martinez & Marco Boscolo

Anna Ragni

Changes in diet and the reduction of the human jaw through time has led to increased crowding, malocclusion, and cavities in modern humans. Modern mandibles are smaller and less robust, shaped by softer processed diets and reduced mechanical demands. Though we know narrow mandibles are associated with higher instances of malocclusion, and malocclusion can increase rates of cavities, there is a gap in the literature assessing the direction relationship between mandible shape and rate of cavities. We hypothesize that specific mandibular shapes are associated with a higher prevalence of cavities. To test this hypothesis, dental caries (cavities) will be documented for 40 contemporary Floridian mandibles. Cavities will be manually counted and combined with dental record information to categorize mandibles by the number of cavities they have. Mandibles will be 3D scanned to document their shape. Using geometric morphometrics techniques, we will visualize shape differences between mandibles with different numbers of caries and quantitatively carry out a MANOVA on PC scores to assess statistical significance of shape differences. We expect our hypothesis to be supported and that we'll find individuals with narrower mandibular arches to have higher rates of dental cavities. This study explores how dietary shifts directly influence jaw structure and dental health, shining light on modern oral health challenges while paving the way for potential strategies in prevention and treatment. These findings could impact the future of dental healthcare.

University of Tampa

Battle of the Sexes: The Impact of Gender on Household Spending and Saving

Carmen Ana Benitez

Monica Escaleras

What factors influence the spending behavior of Americans? Arguably, one of the most significant and relevant indicators of the U.S. economy is the spending and budgeting patterns of households. The Federal Bureau of Labor Statistics tracks these patterns, along with other key economic indicators, to assess the overall health of the national economy. I hypothesized that gender did not have an impact on saving, spending, and budgeting patterns in American household. I conducted research by creating a questionnaire and collecting 142 completed surveys through Amazon Mechanical Turk. The data was analyzed using IBM's SPSS software. My results showed me that gender was a defining factor among respondents. I found a significant difference in the responses from different genders. While 86.1% of females agreed or strongly agreed that they noticed increased prices, only 61.8% of males replied similarly. This was statistically significant at less than 1%. I also saw 52.7% of females admitted they save between $3001 to $5000, as opposed to 17.3% of males who said they save an amount within the same range. This finding was found statistically significant at the <1% level. These findings contradicted my hypothesis. From this I can conclude that more females are likely to confidently claim that there have been price increases in necessary goods and services. Females are also more likely to save more monthly for future goals. I believe that the public could take advantage of this knowledge to recognize the differences between genders in the economic and financial sphere.

Florida Atlantic University

A Review of Process/Property Relationship for Fused Filament Fabrication Ultem 9085 Resin

Carson Rogers & David Trosclair

Jutima Simsiriwong

In recent years, Fused Filament Fabrication (FFF) 3D printing has become a dominant manufacturing technique in multiple industries. The FFF process involves the sequential layering of thermoplastic filament to form solid parts. The FFF

3D printing offers many advantages to traditional manufacturing methods such as decreased lead times and material waste. While the FFF process does have many upsides, there are some limitations to the manufacturing process. These limitations mainly affect the mechanical properties of the manufactured part. These properties include the tensile fracture strength, the flexural strength, and the elastic modulus of the part. It has been found that the shortcomings of FFF can be minimized by adjusting certain parameters in the fabrication process. Some of the parameters found to heavily influence the mechanical properties are the print chamber temperature, print bed temperature, nozzle temperature, print width, print orientation, raster angle, infill, and raster speed. The goal of this review is to explore the relationship between these parameters and the mechanical properties of the fabricated part constructed with the Ultem 9085 thermoplastic resin. By defining these relationships, the FFF process parameters can be optimized for Ultem 9085 to suit the needs of the intended design. Ultimately bridging the gap between manufacturing limitations and functional requirements.

University of North Florida

The Relationship between AI Usage, such as ChatGPT, for Academic Tasks, and DSC Students' Self-Esteem and Self-Efficacy.

Cassandra Charles & Noah Glenfield

Benjamin Graydon

Researchers have previously explored the connections in the usage of Artificial Intelligence amongst college students. Previous studies by (Zhang et al., 2024, p. 3) found that students who overuse and rely more on AI for immediate solutions have a low academic self-efficacy. The purpose of this study is to showcase the relationship between DSC students' AI usage and their self-reported self-esteem and self-efficacy. The study's researchers surveyed 59 students at Daytona State College using both the Self-Esteem Scale (Rosenburgh, 1984) and the Generalized Self-Efficacy Scale (Schwarzer, R., & Jerusalem, M. 1995). The results of the study indicate that AI users have a higher self-reported self-esteem score than non AI users. While the AI users surveyed reported higher levels of self-esteem and self-efficacy the researchers did not yield any statistically significant results. The results contradicted the previous research findings of lower self-esteem and self-efficacy causing the increased use of AI. Future research may be needed to gain more data as the limited sample size may be specific to Daytona State College.

Daytona State College

Reptile and Amphibian Populations in Highlands County

Cassidy Albritton

Dr. Mintoo Patel

Reptile and amphibian populations in Highlands County, Florida, are ecologically significant and potentially vulnerable to threats such as habitat degradation, climate change, and anthropogenic activities. This study seeks to evaluate the diversity and distribution of these populations across various habitats within the county, with an emphasis on identifying trends in species richness. Data will be gathered through field surveys in a range of environments, including wetlands, forests, and grasslands, utilizing both visual encounters and passive sampling techniques, such as cover board deployment, to provide a comprehensive assessment of species composition. It is hypothesized that urban expansion, along with the growing development of construction and agricultural activities in Highlands County, will significantly alter the distribution of reptile and amphibian populations. Specifically, species that are dependent on natural habitats—such as wetlands and forests—are anticipated to experience reduced abundance or shifts in range due to habitat fragmentation, degradation, and conversion to agricultural or developed land. In contrast, species that are more tolerant of anthropogenic disturbances may exhibit an increased presence in urbanized areas. This hypothesis posits that ongoing land-use changes, driven by construction and agricultural expansion, may disrupt local ecological dynamics, posing potential risks to the persistence of certain reptile and amphibian species.

South Florida State College

Assessment of Microplastics in the St Johns River in Jacksonville, Florida

Catherine Jeffries & Josephine McKenna

Dr. Gretchen Bielmyer-Fraser

The St. Johns River is the longest river in Florida, flowing northward through Jacksonville, Fl and emptying into the Atlantic Ocean. The river is important both commercially and recreationally but is facing increasing threats from pollution. One of these threats is microplastics. Microplastics are plastic fragments smaller than 5 millimeters

in diameter and have been an increasing concern worldwide. Microplastics can enter the environment either as a microplastic or can be broken down from larger pieces of plastic. They can accumulate in water, sediment, and animal tissues. Microplastics can be harmful to aquatic organisms and in turn, humans as well because of the chemicals that they introduce into the environment. This study quantified the concentration of microparticles and microplastics and assessed their characteristics at seven sites along the river over the span of three months (August, September, and October 2024). The microparticles were observed under a dissection microscope, quantified and classified by shape and color. Suspected microplastics were then analyzed by a Fourier-Transform Infrared Spectrometer (FTIR) to determine polymer type. Microparticles were most abundant, with kappa and rayon filaments dominating in the samples. Additionally, the abundance of both microparticles and microplastics increased following severe storm events during the sampling period. These results have implications for aquatic ecosystem health.

Jacksonville University

The Negative Impacts of AI in the Animation Industry and its Effect on Future Generations.

Catherine Pacter

Dr. Sonji & Dr. Chase

AI is revolutionizing the animation industry, but not without significant consequences. While AI offers efficiency and cost-saving benefits, increasing AI-generated content raises ethical concerns surrounding ownership and originality, as it often relies on datasets sourced without clear consent or proper credit to the original creators. Additionally, the accessibility of AI tools also introduces the potential for oversaturation of low-quality content and mass-produced animations, destroying the overall standard of the industry itself. Another major concern surrounding my topic is job displacement, as AI automates roles traditionally done by skilled artists, reducing opportunities for human artists and future generations.

Furthermore, AI's increasing role in the animation industry is significantly impacting future generations, particularly younger audiences like Gen Alpha ("iPad Kids") who consume media regularly. The increasing amount of AI-generated content risks exposing younger audiences to content that may lack depth, originality, and emotional quality. AI-driven productions often prioritize efficiency over storytelling quality, potentially leading to a generation accustomed to data-driven media. Moreover, AI-generated content is often not filtered, which could expose younger audiences to inappropriate or low-quality content. This lack of management raises concerns about the long-term impact on their understanding of creativity, ethics, and the value of original work.

Florida SouthWestern State College

ART (Antiretroviral Therapy) Inspires Art: Examining How Visual Art Created by HIV+/ AIDS Patients Helped Decrease the Stigma Around AIDS in Florida

Catherine Smith

Dr. Nina Stoyan-Rosenzweig

Art is a language that surpasses simple words and can share a multitude of experiences that connect humans from all walks of life. This includes the ability to educate others about potentially challenging and or heavily stigmatized issues. A particular stigma filled issue in the past 100 years has been HIV (human immunodeficiency virus) which is a disease that can develop into AIDS (acquired immunodeficiency syndrome). The transmission of HIV is an epidemic in the United States with Florida being considered the epicenter within the Southern part of the country. Oftentimes, people were ostracized from their social groups, scared out of their towns, or forced to abandon all that they once had. To combat the dangerous and debilitating stigma that one may face when they are diagnosed with this disease, HIV+ artists have turned to creating visual art to speak about their experiences. To highlight their efforts in more detail, a digital exhibit was created to understand, explain, and showcase art made by HIV+ individuals who are either from or have ties to Florida.

University of Florida

Cognitive Impairment and Depression in Hispanic and Non-Hispanic Low-Income Older Adults: A Cross-Sectional Study

Cecil Laatta

Dr. Ladda Thiamwong

Hispanic older adults represent a growing population in the United States and may be disproportionately affected by cognitive impairment and depression. Depression is associated with a heightened risk of developing dementia, and cognitive impairment can occur during or between depressive episodes that can affect daily life and contribute to disability. This cross-sectional study is a part of the National Institutes of Health (NIH)-funded study that examined the relationship

between cognitive impairment and depression in 157 low-income older adults, including Hispanic (n=91, age: M=76.4, SD=6.8) and non-Hispanic White (NHW) (n=66, age: M=76.2, SD=6.5). We used the Memory Impairment Screen (MIS) to assess cognitive impairment and the Patient Health Questionnaire (PHQ-9) for depression. A Chi-square test indicated a higher prevalence of cognitive impairment among Hispanics older adults compared to NHW ($X^2(1)=7.528$, $p=.006$). However, Mann-Whitney U tests found no significant differences in depression levels between Hispanic and NHW ($U=2930.50$, $p=.794$). Similarly, depression levels did not differ significantly between those with cognitive impairment and those without in either Hispanic ($U=839.00$, $p=.708$) or NHW ($U=227.50$, $p=.929$). These results highlight that cognitive impairment is more prevalent among Hispanic older adults than their NHW counterparts. These scores are likely due to the socioeconomic challenges faced by low-income participants which contributes to the higher prevalence of cognitive impairment in Hispanic older adults specifically. Future research should explore these socioeconomic factors contributing to the higher prevalence of cognitive impairment in Hispanic older populations and its implications for mental health interventions.

University of Central Florida

Visual Scanning Behaviors for Racially Ambiguous Faces are Impacted by Racial Context

Cela Rivera & Emilia Greco

Benjamin U. Marsh

We have poorer memory for racial outgroup faces than racial ingroup faces. Moreover, faces difficult to racially categorize (Low Ethnic Typicality) are processed better than racial outgroup faces that are high in ethnic typicality. Racial outgroup faces with Low-ET lose that memory advantaged when grouped with their respective high-ET faces (results from a previous LCC Lab study). Given this result, we suspected that low-ET racial outgroup faces were experiencing noticeably different visual scanning practices that afforded better memory when compared to high-ET racial outgroup faces. To test this hypothesis, visual scanning patterns of 83 White college-age participants (Female = 58) were recorded while studying 64 faces (16 Asian, 16 Black, 16 Latino, 16 White), half which were high-ET and the other have low-ET. Moreover, faces were presented in different racial blocks. Four blocks had racially homogeneous sets of faces. Eight of these faces were high-ET and four were low-ET. The fifth block consisted of only low-ET faces and was racially heterogeneous. We expected visual scanning patterns for low-ET racial outgroup faces to be significantly vary by the racial context (group with respective High-ET faces or with other Low ET faces) in which the faces are presented. When low-ET faces were presented with other low-ET faces, participants directed more visual attention to the nose and mouth and less to the forehead compared to high-ET faces and the low-ET faces grouped with high-ET faces. These findings suggest that the racial context of low-ET faces impacted how these faces are perceived and remembered.

University of Tampa

Ultraviolet Exposure Behaviors Among College Students: Examining Risk Awareness, Protection Practices, and Sun Safety Attitudes for Skin Cancer Prevention

Celia Callahan

Dr. J.C Andersen

Skin cancer, the most common cancer in the United States, affects 1 in 5 Americans, with a 31.5% rise in melanoma diagnoses between 2011 and 2019. Despite increased awareness of its risks, ultraviolet (UV) radiation exposure remains a significant public health issue. While skin cancer prevention in children and older adults has been widely studied, the UV exposure habits of college students (ages 18-23)—a population often known for its high-risk behaviors—remains under examined.

This study investigates college students attitudes toward sun safety, including sunscreen use, tanning, and skin cancer self-detection. Using a cross-sectional design, data was collected via an anonymous online survey administered to University of Tampa students. Participants answered questions on demographics, sun safety practices, and cancer identification. We intend to determine if college students with lower awareness of skin cancer risks will engage in fewer sun-safety behaviors such as not wearing sunscreen or going tanning. By exploring college students' attitudes and practices related to sun safety, we can better address the risks they face. This understanding allows for the development of targeted interventions to promote healthier habits and reduce the incidence of melanoma and other skin cancers.

University of Tampa

The Impact of Cultural Differences on Dynamics of Small Isolated Teams During Global Crisis

Cesar Orue, Andres Kaossar & C. S Burke

Constance Shawn Burke

Cultural differences and the resulting perceptions can significantly impact team dynamics in small interdependent teams, like crew members of space analog missions (Burke & Feitosa, 2014). While cultural pride can be a source of strength it is important to be aware of its potential effects on team dynamics. While these differences can enhance crew experiences they can also lead to a lack of shared mental models and encourage usage of maladaptive coping mechanisms (Szabo et al., 2024). In long duration space travel a multicultural space team will be isolated for a long duration of time. Global divisive events such as the Russian invasion of Ukraine may thus be disruptive and impede mission success. Leveraging a case study approach, we aim to investigate how cultural differences affect coping mechanisms and shared mental models of crew members in a long-duration space analog mission during the Russian invasion of Ukraine. For this, we content-coded journals gathered from the members of a crew whose mission overlapped with the beginning of the Russo-Ukrainian war. We leverage qualitative content analysis to investigate the crew's internal dynamics related to the invasion. We aim to understand how mitigating the effects of cultural makeup on differences in perceptions about global events can support future long-duration space exploration missions. We offer valuable insights for enhancing international cooperation, fostering empathy, and building effective cross-cultural partnerships in small isolated, confined, and extreme teams (ICE) like astronauts in space or remote polar research stations in times of crisis.

University of Central Florida

Computer-Vision Based Behavioral Coding for Music-Based Interventions: A Pilot Study

Chirantana Dayanandaswamy & Roy Chen

Dr. Hongdao Meng

Music-Based Interventions (MBIs) are promising approaches to help manage symptoms of dementia. Designing and conducting rigorous scientific studies of MBIs requires accurate assessment of participant responses to these interventions. There is a paucity of research on valid and reliable behavioral coding schemes for the objective assessment of engagement behaviors during MBIs. This study aims to develop and validate a computer-vision-based behavioral coding scheme for assessing engagement with music among persons living with dementia. We reviewed the literature on behavioral coding schemes used in social activity engagement studies and developed an event-based video coding scheme for measuring engagement with MBIs among persons with dementia. Specifically, engagement was operationalized by the following four domains: attentional, affective, behavioral, social interaction engagement and disengagement. The research team will use this coding scheme alongside the Engagement of Persons with Dementia Scale (EPWDS), a validated tool to code behavioral responses of five persons with dementia over three one-hour sessions of group music interventions conducted in an assisted living community. Computer-vision-based coding of facial expressions, verbal interactions, and bodily movements will also be performed on these videos. Results will be compared across raters to assess inter-rater reliability and across all three coding schemes to assess predictive accuracy. The resulting coding scheme will contribute to the field of MBI research and improve the quality of care for persons with dementia in assisted living facilities.

University of South Florida

Effect of Donor Blood Stream Infections on Post Liver Transplant Infections and Outcomes

Roy Chen

Dr. Vijay Subramanian

Early post liver transplant (LT) bacterial and fungal infections impact outcome. The impact of donor blood stream infections (BSI) on LT outcomes is unknown. There is some concern that Normothermic Machine Perfusion (NMP) can increase risk of graft infections due to its ex-situ nature. This study's goal was to determine the role of donor BSI and NMP in post LT outcomes. Retrospective review of LT from January 2020 to April 2024 was done. Post LT BSI was defined as positive blood culture within 7 days of LT. Donor BSI was obtained from UNOS database. Perfusate cultures were obtained on all NMP cases. Outcomes were compared as appropriate. Among 755 LT recipients (LTR), 117 LTR had a positive donor BSI (15%). There were no differences in donor demographics or donor type in those with and without BSI. Donor BSI was associated with a positive LTR BSI in 12 patients (p=0.012). Among those, 7 LTR culture organisms were the same as the donor. There was no difference in post LT survival in those with and without donor BSI. LTR

with BSI had worse overall survival compared to those without ($p<0.001$). NMP perfusate cultures were positive in 8 patients, among which 2 LTR developed BSI ($p=0.01$). Donor BSI was associated with LTR BSI in cold storage livers and the development of LTR BSI post LT. Recipient BSI is associated with poor outcomes, and NMP may be useful in reducing risk of BSI transmission due to additional antibiotics provided during NMP.

University of South Florida

Poster Session II – Abstracts

DriveSense: Intelligent Driver Assistance for Enhanced Road Safety

Bongiwe Sandi & Aldridge Kalenga

Juan Calderon

This project aims to develop an advanced driver assistance system leveraging cutting-edge computer vision and artificial intelligence technologies to enhance road safety. The system continuously monitors the driver, analyzing emotional states such as anger, fear, or sadness to mitigate accident risks linked to emotional factors. It also identifies distractions and hazardous behaviors, including lack of focus on the road, signs of fatigue, and episodes of microsleep. In response to such risks, the system delivers timely interventions, alerting the driver and recommending corrective actions, such as taking a break or refocusing attention. By integrating real-time emotional assessment with behavior monitoring, this solution offers a proactive approach to accident prevention, addressing human factors and contributing to safer driving conditions. This innovative project represents a significant advancement in reducing road accidents through intelligent, adaptive technology.

Bethune-Cookman University

Safe Space or Save Space: How Genderqueer College Students Navigate the Closure of LGBTQ+ Resource Centers

Charlie Arechederra

Dr. Jenny Stuber

As of the fall of 2024, 196 institutions across 29 states had seen a reduction in their DEI efforts, typically due to state-level legislation (Chronicle). Legislation in Florida has eliminated diversity training and de-funded campus DEI centers. One year after these bills passed, LGBTQ Resource Centers at Universities in Northeastern Florida, among other resource centers, closed their doors. Campus LGBTQ Centers were a space in which queer students could enjoy each other's company, a source of sex education and safe sex resources for all students, and a symbol of acceptance for queer students attending their universities. Research shows that spaces such as LGBTQ Resource Centers act as a counterspace for minoritized groups such as LGBTQ students. Counterspaces are typically spaces where minoritized groups can exist outside of the confines of the dominating group, the norms of a primarily cisgender and heterosexual society. Prior research surrounding counterspaces and LGBTQ students suggests that the closure of the LGBTQ Center would have adverse effects on LGBTQ students; the current study aims to understand if this is the reality of the situation. Through a series of semi-structured, in-depth interviews with students who identify as gender-diverse in some manner, not cisgender, I ask how the closure of the center has impacted their sense of community, belonging, and safety at their University. The primary finding throughout these interviews was that administratively backed counterspaces are essential for symbolic, material, and community-building purposes no matter what other unofficial or student-lead counterspaces exist.

University of North Florida

Investigating student understanding of Laboratory Errors and Instrument Calibration

Charlotte Disney

Dr. Tamra Legron-Rodriguez

Precise measurements and observations are critical in all areas of science, making error awareness crucial for maintaining integrity. This laboratory investigation aims to enhance the understanding of measurement errors by prompting students to consider potential errors during a simple water measurement experiment. Students were given a pre-lab and post-lab assessment that included a scenario: A student pipettes 1.00 mL of water into a weighing container and determines the mass using an analytical balance and two open-ended questions: 1) What are the sources of error associated with the process? And 2) What are some ways to minimize the errors associated with the process? During the lab, students were given the procedure outline and materials. Student responses to the post-lab were collected, after which, two researchers coded independently, then met to review and agree on codes. The preliminary analysis shows that the most common errors identified were water spillage during the transfer, misuse of pipettes, calibration issues, general human error, incorrect tare, and general uncertainties of the balances and pipettes. The

most common solutions identified by the students were confirmation of math and calculations, repeated trials, training or preparation regarding student pipetting techniques, and ensuring all tools were calibrated correctly and properly cleaned to reduce possible contaminants. The ability to identify and address errors in student laboratory experiments can lead to an enhanced understanding of experimental processes. This project also emphasizes that a straightforward experiment can be employed to gauge students' comprehension of laboratory errors in either a novice or expert approach.

University of Central Florida

Role of Mitochondrial Fission on CVB3 Replication and Myocarditis

Charwan Hamilton

Dr. DeLisa Fairweather

Myocarditis is a leading cause of sudden death from heart failure in children and adults under the age of 50 in the US and worldwide. Enteroviruses like coxsackievirus B3 (CVB3) induce myocarditis by hijacking the energy of cardiac mitochondria to make more virus and escape from cells in extracellular vesicles that contain virus and mitochondria, which are called Mitopods' We hypothesize that the ability of viruses to do this will be affected by mitochondrial fission/division which is induced by dynamin related protein 1 (Drp1). The objective of this study is to determine if the inhibition of Drp1 will reduce myocarditis, viral replication and Mitopod release. Our initial experiments included inhibiting Drp1 in cultured HL-1 cardiomyocytes and macrophages using small interfering RNA (siRNA) vs. scrambled siRNA control. We also are examining tamoxifen-inducible Drp1 deficient mice specific either for cardiomyocytes or macrophages. First, we confirmed that siDrp1 was able to decrease Drp1 levels using western blot. We found that viral replication was decreased when Drp1 was inhibited using western blot, qPCR to detect VP1, and plaque assay to detect replicating virus. We found that cardiomyocyte and macrophage-specific inhibition of Drp1 decreased myocarditis. Characterization of mice is ongoing including the effect of Drp1 inhibition on viral replication in the heart and Mitopod release. We have found that Drp1 increases myocarditis and viral replication in cardiomyocytes and macrophages. Targeting this protein may be used to reduce clinical disease in the future.

University of North Florida

Light Weight Flexible Heat Pipes for Space Applications

Chase Gibson

Dr. Christopher Oshman

The satellite industry is an important aspect of human life. One of the largest cost factors for satellites is the payload weight. This research aims to provide a viable way to reduce this cost. With the use of light weight Mylar based flexible heat pipes (FHPs) for heat mitigation. These devices can be used to cool electronics on satellites and take up less space and weight than conventional methods. The properties of Mylar based flexible heat pipes can also be used with devices that fold or extend, such as folding solar arrays. The flat Mylar based flexible heat pipes being tested in this research are being produced using a novel approach. To produce (FHPs) with complex shapes such as a helix the use of vacuum forming is required to form the Mylar layer in a semicircular shape. The (FHPs) will also need to be split into multiple crescent shaped sections to form a helix. Meaning that multiple heat pipes will be connected to form a single helix. Testing of the (FHPs) makes use of a heat source and heatsink that are attached to the ends of the (FHPs). Across the heatsink there are four thermocouples that collect temperature data. Using this temperature data and Fourier's law the heat flux and efficiency of the heat pipe can be determined.

University of North Florida

Employment of AI Recognition Technology in the Emergency Room

Chay Jalloh & Salaheldin Ali

Dr. Bo Pei

The lengthy waiting time is one of the most common complaints involved in hospital visits, which is riddled with inefficiencies, potential for bias and unnecessary expenditure of crucial resources. Although diversity and sensitivity training are common in many workplaces today, the potential for biased assessment of a patient's condition by triage nurses cannot be overstated. This study proposes an integrated system of human interaction and AI utilization, leveraging the AI visual and verbal recognition technology trained on diverse samples to increase the speed and objectivity of patient condition. Particularly, the AI models will be trained on diverse samples with stratified random sampling to enhance the inclusiveness and fairness of the models. The information including age, ethnicity, body weight, height, socioeconomic status and expressions

of pain, will specifically be collected. Keyword Extraction (KE) will be used to extract certain words from the patient's response to know how urgent the patient's condition is, based on this a waiting time would then be assigned. Additionally, to mitigate the patients' feelings of apprehension while using the platform, multiple human computer interaction strategies will be adopted to provide timely and step-by-step guidance to mitigate the patients' feelings of apprehension while using the platform. It is our hope that the implementation of the platform will significantly expedite the process of triaging and decrease the potential for forms of unconscious bias.

University of South Florida

Targeting Inflammation: The Role of JAK Inhibitors in Vitiligo Treatment

Chinaza Munonye

Dr. Hector Gomez

Vitiligo is a multifactorial autoimmune condition characterized by extensive destruction of melanocytes, creating depigmented patches on the skin.The Janus kinase/signal transducer and activator of transcription (JAK/STAT) pathway plays a vital role in its pathogenesis, as it facilitates cytokine signaling that leads to inflammation and immune cell recruitment. The pathway's dysregulation leads to the depletion of melanocytes due to the actions of CD8+ T cells and inflammatory proteins such as interferon-gamma (IFN-). Although current treatments like corticosteroids and phototherapy can manage symptoms, they fail to properly target the root cause of immune dysfunction.

This review assesses how JAK inhibitors regulate cytokine signaling in order to prevent melanocyte destruction and support repigmentation in vitiligo.

The search terms "Vitiligo" and "JAK/STAT pathway" were employed. Each article was then evaluated for its examination of the JAK/STAT pathway's involvement in vitiligo pathogenesis and the efficacy of JAK inhibitors, which refined the selection to 30 relevant papers.

Findings indicated that JAK inhibitors, such as ruxolitinib, decrease the production of chemokines such as CXCL9 and CXCL10, thus restricting T cell-induced melanocyte destruction. Clinical trials showed notable improvement in skin pigment restoration, particularly when using topical products along with narrowband UVB phototherapy. Systemic treatments, despite their effectiveness, come with a higher risk of side effects due to immunosuppression.

These results highlight the possibility of using JAK inhibitors as a targeted therapy for vitiligo. Future research should improve dosing strategies, investigate combination therapies, and broaden studies to include diverse populations to optimize therapeutic outcomes.

University of South Florida

Leveraging Visual Mnemonics in Medical Education: Enhancing Memory Retention through DrawMnemonics.

Chinmay Patil

Daniel Czyz

Visual mnemonics, pioneered by platforms like Sketchy, Pixorize, and Picmonic, have revolutionized the way medical and science students retain complex information, often improving recall by over 200% compared to traditional methods. These tools combine imagery with key concepts to anchor memory retention effectively, with studies showing dramatic improvements in long-term recall and perceived study efficiency. For example, research on Picmonic reported a 208% increase in recall scores after one month, while the Dean Vaughn Medical Terminology System demonstrated a 40% improvement in retention using sound and imagery.

Building on this foundation, DrawMnemonics is an innovative educational tool recently piloted in MCB4271-Antimicrobial Resistance at the University of Florida. This tool integrates large language models with AI-generated visuals to create personalized mnemonic scenes tailored to course-specific content, such as drug mechanisms of action, resistance pathways, and key resistant pathogens. By aligning visual aids with the course's demanding curriculum, DrawMnemonics addresses the challenge of mastering intricate material while enhancing student engagement.

Initial feedback indicates that DrawMnemonics simplifies the memorization of complex content and boosts engagement, offering a more adaptable and dynamic approach than traditional platforms. It personalizes the learning experience by catering to individual needs, providing targeted support for the course's most challenging topics.

By leveraging the proven efficacy of visual mnemonics and enhancing them through AI-driven personalization, DrawMnemonics demonstrates significant potential to transform antimicrobial resistance education. Future research will evaluate

its broader impacts on student comprehension, retention, and satisfaction, positioning it as a promising advancement in science and medical education.

University of Florida

Impact of the Gut Microbiome on Metabolite Production and Placental Function

Chloe Van Horn

Dr. Dominick Lemas

The gut microbiome has been increasingly linked to diverse health outcomes, including Intestinal Bowel Diseases (IBDs), Non-Alcoholic Fatty Liver Disease (NAFLD), and pregnancy-related disorders such as preeclampsia. Microbial metabolites produced in the gut can enter systemic circulation through blood plasma, influencing cellular functions in distant organs, including the placenta. This study aims to elucidate how gut microbiome-derived metabolites impact plasma composition and placental function.

We identified 3-Hydroxyphenyl Acetic Acid (3-HPAA) as a target metabolite from clinical blood plasma samples. Placental cells were treated with varying concentrations of 3-HPAA for 72 hours, after which cells and culture media were collected for analysis. Gene expression was assessed using qPCR to identify potential changes in regulatory pathways. We hypothesize that genes crucial for placental function will exhibit significant alterations in expression.

The findings from this study will provide insights into the mechanisms by which the gut microbiome contributes to pregnancy-related disorders, broadening our understanding of host-microbe interactions and their implications for maternal health.

University of Florida

Additive Manufacturing Bio-Inspired Thermosyphons for Thermal Energy Storage

Chris Detky & Ryan Spence

Christopher Oshman, Ph.D., P.E.

The use of renewable energy sources such as solar, wind, and hydroelectric power allows for lessened environmental impact and reduced carbon emissions. However, it poses new challenges to the electrical grid due to the inability to control the input from such sources. This can result in power fluctuations when there is excess power production during low demand times or high demand on the grid during low production times. An innovative method to mitigate these effects is the implementation of thermal energy storage (TES). TES units take in thermal energy, usually by converting electrical energy, store that energy using insulation such that minimal thermal energy is lost during storage, then release thermal energy to be used as is or to be converted into electrical or mechanical energy. This thermal energy extraction is propagated through a thermosyphon and thermal valve, which are sealed heat pipes that uses the heat transfer mechanics of a liquid's evaporation and condensation energy to transfer thermal energy from one end to another more efficiently than pure conduction. The construction of such thermosyphons is currently limited to cylindrical designs by the constraints of subtractive manufacturing. Due to advances in 3D printing technology, complex thermosyphon geometries could be constructed using additive manufacturing methods. This research shows the results of additively manufactured copper thermosyphons using a copper powder impregnated PLA filament. If the thermosyphons perform comparably well to thermosyphons made with typical manufacturing methods, the manufacturing of variable geometry bio-inspired thermosyphons should be considered a viable testing avenue.

University of North Florida

A Meta-Analysis Approach to Examine the Effectiveness of Consumer Graded Warable Device on Physical Activity Level among People with Neurodevelopmental Disability

Christian J Farrell

Dr. Willie Leung

While WDs, like Fitbits and Apple Watches, have shown effectiveness in increasing PA among the general population, their impact on individuals with NDD remains understudied, despite the unique barriers this group faces in participating in PA. This study investigates the effectiveness of consumer-grade wearable devices(WDs)in promoting physical activity (PA) during PA intervention targeting individuals with neurodevelopmental disabilities (NDD) through meta-analysis techniques. A systematic search across six databases was performed to identify relevant studies, with eight meeting the inclusion criteria of using WDs in PA intervention, measuring PA outcomes before and after the intervention, and including participants with NDD in the interventions. Results understand the random-effects model found a medium to large positive effect of PA interventions using WDs on PA among individuals with NDD (Hedges's g = 0.84, SE = 0.41, 95% CI [0.03, 1.64], p = .04). The

results indicated that use of WDs lead to increase in PA among participants with NDD. However, high heterogeneity ($Q = 66.06$, $I2 = 85.38$, $p < .01$) and publication bias (Egger's regression, $p = .03$) were found. This study highlights the potential for WDs to support PA improvements in individuals with NDD. Despite these positive findings, further research is needed to evaluate WDs in everyday settings, which is not in a control environment, to promote PA. Exploring ways to integrate these devices into daily life and finding appropriate approaches in using WDs to promote PA for individuals with NDD could further enhance the utilization of WDs among this special population.

University of Tampa

Exploring Breast Cancer Subtypes, Disparities, and Precision Medicine: Insights from Predictive and Molecular Analyses

Christiana Daria Mihaila & Merna Guirguis

Anandita Makkar

Breast cancer is a complex and heterogeneous disease shaped by a combination of genetic, molecular, and environmental factors, with significant variations in prognosis and therapeutic response across its subtypes. This study systematically examines the influence of breast cancer subtypes on treatment outcomes, utilizing predictive modeling, biclustering analysis, and insights into inflammatory pathways to identify novel strategies for disease management and prevention. The research underscores advancements in antibody-drug conjugates, radiotherapy, and mechanisms of DNA repair, alongside innovative prevention strategies derived from engineering approaches. A particular focus is placed on the interplay between socioeconomic factors and breast cancer outcomes among individuals aged 20 to their early 30s, with a particular emphasis on racial and ethnic disparities. It highlights the critical role of genetic factors and inflammatory processes in shaping these differences, offering insights into the underlying mechanisms driving outcome variability in this demographic. Through an integration of systematic reviews, comparative analyses, and data-driven methodologies, this study provides a comprehensive evaluation of the challenges and opportunities in breast cancer treatment. It advocates for a precision medicine approach that incorporates molecular profiling and targeted prevention strategies to improve survival outcomes and address disparities in care. This synthesis bridges critical gaps in current knowledge and offers actionable pathways for enhancing clinical management. The findings offer a foundation for equitable therapeutic innovation and policy-driven approaches that address the unmet needs of high-risk and underserved populations, ultimately aiming to advance the field of breast cancer research and treatment.

University of South Florida

Patterns in Visible and Nonvisible Lattice Points and Polygons

Christina Mark

Dr. Thomas Luckner

A visible lattice point is an integer point in the real plane where a line drawn from the origin to the given point does not intersect any other integer points. Herzog and Stewart gave a construction for finding any patch of visible and nonvisible lattice points in the real plane although this construction does not optimize its location in the plane. Goodrich, Mbirika, and Nielsen improved this result for finding square nonvisible patches, yet this method is still not optimal. We adapt these constructions to find visible lattice polygons. We also include related results to this construction. We will provide Python implementations for the constructive methods of patches of visible and nonvisible lattice points and our visible lattice polygons.

Flagler College

Mapping Histone H2B-mCherry Genomic Insertion Sites Relative to DNA Replication Chromatin States in Maize

Christine Lezama

Hank W Bass

Chromatin dynamics are fundamental to understanding gene expression regulation and chromosome behavior during cell replication. Histone H2B fused with mCherry (H2B-mCherry) was used to produce maize plants with fluorescent chromosomes for cytogenetic studies. The multiple transgene insertion events will be used to test the effect of the chromatin state on insertion sites.

For the 6-10 different insertion lines in this study, fluorescence microscopy will be used to confirm active H2B-mCherry. Gene expression analysis will be conducted using quantitative PCR to assess changes in transcription associated with the gene insertion. The maize genome has been classified into segments as replicating early, middle, or late in the S-phase (DNA synthesis phase). I will map the genomic location by PCR and use that information

to test the hypothesis that transgene insertion is enriched in early-replicating chromatin rather than late-replicating chromatin.

This research examines a phenomenon called the genomic position effect, whereby the site of insertion can stably affect the gene expression levels of an otherwise identical gene, as seen with our fluorescent histone reporter genes in this case study. The plant and lab materials, equipment, and expertise needed are available for this project and build on my prior training as an undergraduate research scholar in Dr. H.W. Bass's lab (Biological Sciences), where I work on maize genome replication.

Florida State University

Thermal Energy Storage for Stoves

Christopher Relken & Benjamin Tom

Christopher Oshman, Ph.D., P.E.

During the day there is an abundance of renewable energy that can be utilized, however at night, peak usage of the power grid is heavily relied on which releases large amounts of CO2. In typical households cooking stoves require especially high electrical power, which is not practical for electro-chemical batteries. The aim of this research is to provide a way to store thermal energy in stove-top appliances to be utilized during the night. This concept will provide a method to utilize thermal energy from storing the energy used beforehand, allowing the user to use this stored energy to power the stove. The process would be based on a thermosyphon design where the device employs a working fluid to transfer the heat energy from the Thermal Energy Storage (TES) to the burner. One of the main novelties is the thermal valve used to throttle the working fluid. Our research team is utilizing heat transfer mediums such as solar salts as a working fluid for its heating and cooling properties which are expected to be 149-593 ˚C. Based on this design, the stove can work without power from the grid, which will reduce the CO2 emissions needed for cooking, especially at night, which is peak energy usage.

University of North Florida

Evaluation of the Impact of Nintedanib and Pirfenidone on the Longevity of Patients with Interstitial Lung Disease

Ciara Crocker & Kylie Overstreet

Dr. Bajwa Abubakr

Nintedanib and Pirfenidone are FDA-approved antifibrotic medications designed to slow the progression of lung volume decline in those with associated Interstitial Lung Diseases (ILD), particularly Idiopathic Pulmonary Fibrosis. Lung transplants serve as a last resort for ILD patients, with the post-transplant life expectancy to average around five years. This research study aimed to investigate the connection between antifibrotic medication use and the longevity of patients receiving a lung transplant. A secondary purpose was also used to evaluate the effect of antifibrotic therapy on the time interval between the date of diagnosis and the date of transplant. We hypothesized that those on antifibrotic medication would experience a longer time interval between the date of diagnosis and date of transplant. A retrospective chart review was conducted on Mayo Clinic patients who underwent a lung transplant for ILD from January 1st, 2010, to May 28th, 2024. The key outcomes measured were medication use, clinical status during medical encounter, laboratory/hematologic measures, pulmonary function test, echocardiograms, stress tests, right heart catheterizations, and 6-minute walk test. The study's results demonstrated a significant increase in the interval between the date of diagnosis and the date of transplant with antifibrotic medication use, indicating medication effectively delays IPF progression. This study is a stepping-stone in a line of projects aimed at bridging the gap between AI and medicine. The subsequent project will look to determine the relationship between antifibrotic medication and pulmonary vascular pathology in lung transplant patients.

University of Central Florida

Neural Regeneration in Zebrafish: Investigating Stem Cell Dynamics Following Spinal Cord Injury

Cindia Marra & Brian Avera

Jeffery Plunkett, Ph.D.

The goal of this research is to explore the regenerative capabilities of zebrafish (Danio rerio) following spinal cord injury, with a specific focus on the crucial role of neural progenitor cells in the healing process. Zebrafish are unique in their remarkable ability to regenerate central nervous system (CNS) tissues with minimal glial scarring. They are an invaluable model for understanding neuronal repair mechanisms that may offer insights for developing therapeutic strategies in human medicine. This study aims to identify the cellular responses activated post-injury, explicitly investigating the dynamics of brain-derived stem cells and their interactions with surrounding neuronal populations during the regeneration process.

To achieve this, we developed monolayer cultures from adult zebrafish brain cells, transitioning to free-floating aggregate cultures that form neurospheres expressing key stem cell markers such as Sox2 and NeuroD1. A detailed examination of the regenerative environment and the identification of specific cellular interactions was performed in seven cultures to evaluate the efficacy of stem cell differentiation and CNS regeneration. The cultures are categorized at 2 4 and 7 days. Preliminary findings indicate that zebrafish brain cells can be successfully cultured and characterized, establishing a foundation for further research into their regenerative potential. Future steps will involve injecting these aggregates into the zebrafish brain, tracking differentiation, and assessing the functional outcomes of spinal cord injury recovery. This research aims to contribute valuable insights into CNS repair mechanisms, potentially informing therapeutic approaches for spinal cord injuries in humans.

St. Thomas University

Beyond Diagnosis: Tailored Support for Children with Autism and ADHD

Cindy Leon

Dr. Sonji Nicholas

This case study examines the developmental, medical, and psychological history of a 13-year-old boy, referred to here as "Lucas," who is diagnosed with Level 3 Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). The study explores the interplay between these conditions, highlighting Lucas' significant communication challenges, sensory sensitivities, and social limitations, alongside his emotional regulation and problem-solving strengths. The study posits that an intervention plan, based on Applied Behavior Analysis (ABA), Sensory Integration, and Erikson's developmental phases, emphasizing the significance of structured, tailored support, can significantly improve the functioning of such individuals and their families. Key tactics examined in this case study include the use of augmentative communication equipment, sensory assistance, and social skill development programs. A family-centered approach, which is especially important in Lucas' case, enables continuity of care and promotes a supportive home environment. This research emphasizes the potential for improvement in functionality of individuals and families contending with ASD and ADHD, by developing meaningful programs that employ culturally responsive, evidence-based interventions. While the findings are specific to Lucas' experiences, they provide valuable insights into strategies that may benefit other families navigating similar challenges. The study emphasizes the need for collaboration among families, educators, and therapists to foster independence and improve the quality of life for people with complex developmental needs. This example contributes to research into holistic, interdisciplinary methods for assisting children with ASD and ADHD, while also offering practical assistance for professionals and caregivers.

Florida SouthWestern State College

Hijacking Sci-fi: Alt-Right Intentional Misinterpretation of The Matrix and More

Clair Mallace

Dr. Warren Jones

Considering Western Alt-right interpretations of American Psycho, Fight Club, The Matrix, and The Boys, this research examines instances of intentional misinterpretation, when people interpret media with a contradictory if not conflicting viewpoint from the general population, such as, self identified sigma males idolizing Patrick Bateman and interpreting him as peak masculinity when the entire purpose of the media is to poke fun at and critique toxic masculinity, additionally the alt-right fans of The Boys who identified with Homelander all the way until season four when they finally saw the intense criticism of fascism, and finally, the hijacking of the Red Pill philosophy of The Matrix by alt-right conspiracy theorists. A key mechanism of intentional misinterpretation is the way the manner of interpretation must in some way fulfill one of the prominent themes contained in the media, hence the intentionality. The very act of misinterpreting the media in this contradictory and conflicting manner results in the viewer becoming the object of the metacommentary they misinterpret. By examining these misinterpretation strategies within the context of the polarization of western society, entertainment, and social media. This research considers many contributing factors from a decrease in media literacy, social media negative feedback loops, and the enshittification of quality storytelling.

University of South Florida

The Impact of Language Mixing on Word Class Usage in a Bilingual Person with Aphasia

Clarissa Salas & Kathleen-Linnea Poindexter

Dr. Gerald C. Imaezue

Stroke-induced aphasia in bilingual individuals may lead to pathological language mixing of their first

(L1) and second (L2) languages during spontaneous speech. In bilinguals with aphasia (BWA), language mixing arises from difficulties in separating languages, resulting in unintended word and phrase switching. While previous research found no differences in language mixing rates between function (e.g., and, the, but) and content words (e.g., car, run, tree), this study examines the phenomenon across open-class (e.g., nouns) and closed-class (e.g., articles) words. Given the greater deficits in closed-class words observed in individuals with non-fluent aphasia, we predict higher rates of language mixing in closed-class words.The participant (P3), a Spanish-English bilingual with severe Broca's aphasia, exhibited significant language production impairments in both languages based on the Western Aphasia Battery Revised (WAB-R) in Spanish and English (Spanish WAB-R Aphasia Quotient = 37.7, English WAB-R Aphasia Quotient = 33.7). Five narrative prompts elicited one-minute speech samples, which were transcribed and analyzed for language mixing patterns. Results revealed that P3 exhibited more language mixing in closed-class words (66.8%) than open-class words (33.2%.) These findings confirm our prediction: pathological language mixing affects closed-class words more than open-class words in BWA. This highlights the need for targeted interventions focusing on closed-class word retrieval in bilingual aphasia rehabilitation.

University of South Florida

Sweetpotato Seed Systems: Advancing National Seed Health in Tanzania through Grower Associations

Claudia-Elena Johnson-Cuellar, Hannah Amaya & Jennifer Laman

Romaric Mouafo-Tchinda

Sweetpotato plays a vital role in low-income countries, providing a highly nutritious and resilient food source for millions of people. Tanzania is the world's third-largest producer of sweetpotato, but its production faces many challenges: pest and disease pressure along with a reliance on a predominantly informal seed system. The objectives of this study were to assess the national sweet potato seed health risks in Tanzania, and to analyze the effectiveness of grower associations (like CHAWAVITAMB-KAZI) in fostering links between stakeholders to strengthen the sweet potato seed system. We performed a cropland connectivity analysis to identify the most risky locations in Tanzania for pathogen and pest spread and establishment. Next, we surveyed growers across the country to gather data on sweetpotato seed systems, enabling us to assess the risks of pathogen and pest spread at national level by comparing networks of growers who are members of the growers' association and those who are not. With the survey data, we then analyzed the perceptions of stakeholders in the sweet potato business and mapped the interaction networks between the key stakeholders in the value chain in order to gain a better understanding of the dynamics of the system. These risk analyses pinpoint the most vulnerable sweet potato-growing regions in Tanzania, and reveal the significance of grower associations in strengthening the resilience of seed systems. This study can inform strategies to enhance the resilience of seed systems in low-income countries, by providing insights into the management of potential risks associated with pathogens and pests.

University of Florida

4-CzIPN-catalyzed intermolecular [3+2] cycloaddition of cyclopropylamines with indoles in the presence of blue light

Cody Bishir

Dr. Liangyong Mei

Photoredox catalysis has recently drawn tremendous attention from synthetic and organic chemists due to the ready availability, sustainability, and easy handling of visible light. By combining visible light with a photoredox catalyst (PC), a wide range of efficient and selective transformations have been achieved under mild conditions. Indole-fused polycyclic compounds are important constituents in a wide range of natural products and pharmaceutical compounds. Thus, finding an efficient protocol for their synthesis is of great significance. Recently, researchers have demonstrated that cyclopropylamines could serve as efficient 3-carbon synthons for visible-light-induced [3+2] cycloadditions, which provides an exquisite approach to synthesize cyclopentane derivatives. The purpose of this project is to construct indole-fused polycyclic compounds through a visible-light-induced [3+2] cycloaddition of cyclopropylamines and indoles. Various photocatalysts (PCs) and solvents have been screened. So far, the best reaction outcome is by employing 4-CzIPN as the PC and nitromethane as the solvent under blue light (= 440 nm) and nitrogen at atmosphere. Two cyclopenta-fused indoline diastereomers are isolated in 30% and 10% yield, respectively, which have been confirmed by their 1H NMRs. To obtain a high reaction yield, the reaction conditions will be further optimized. Once the optimal reaction conditions are obtained,

the substrate scope will be expanded. Lastly, the possible reaction mechanism will also be studied in the future.

University of North Florida

Pyrene Dicarboxylic Acids: Aggregation and Excimer Formation at Metal Oxide Interfaces

Cody T. Basquill

Dr. Kenneth Hanson

The interactions between molecular chromophores/fluorophores can have a profound impact on their utility in a variety of applications including solar energy conversion, light emitting diodes, and biochemical sensing. In many cases, processes like aggregation and excimer formation lower the excited state energy and provide an alternate pathway to relaxation that competes with desirable events like the generation of light or electrical current. Here, we investigate the structural parameters that dictate intermolecular interactions via two pyrene dicarboxylic acid derivatives. Pyrene molecules substituted with surface binding groups at the 1,6 and 2,7 positions, respectively, are used to probe how the orientation and surface coverage of the molecule impact its photophysical properties at the interface. Steady-state and time-resolved spectroscopy is used to show that while both molecules do not aggregate even at maximum concentration and surface loading, the 1,6 derivative exhibits excimer formation when bound to a mesoporous metal-oxide surface.

Florida State University

Wastewater Treatment Using Encapsulated Chabazite in Polyvinyl Alcohol-Sodium Alginate Hydrogel Biofilm Carriers

Cooper James

Dr. Sarina Ergas

Municipal wastewater is a point source of nitrogen and needs effective treatment before discharge. Conventional biological nitrogen removal (BNR) is often costly and energy-intensive. Partial Nitritation/Anammox, or PN/A, is a biological process where part of the ammonium is first oxidized to nitrite. Anammox bacteria convert the remaining ammonium and nitrite to nitrogen gas under anaerobic conditions, reducing aeration costs. However, anammox are slow-growing microbes, and the promotion of biofilm growth is highly encouraged by using biofilm carriers. Zeolites can be used to concentrate ammonium by ion exchange (IX) and provide additional surface area to add to the carriers. In addition, polymeric mixtures, such as polyvinyl alcohol-sodium alginate (PVA-SA), create suitable surfaces for biofilm carriers. This research aims to optimize PVA-SA carriers encapsulating chabazite, a natural zeolite with a high IX capacity for ammonium, to promote ammonium removal from wastewater and a suitable surface for biofilm growth. To create the PVA-SA carriers encapsulating chabazite, PVA-SA was mixed with DI water before adding crushed chabazite with 4% barium chloride. A 24-hour kinetic experiment in 250-mL flasks evaluated ammonium removal with an initial ammonium concentration of 100 mg/L as N and with/without chabazite or PVA-SA carriers. Preliminary results indicate that crushed chabazite embedded in the carrier adsorbs ammonium more effectively than uncrushed chabazite, while PVA-SA carriers without chabazite show minimal adsorption. Future work will involve testing carriers with anammox bacteria and developing a complete PN/A treatment system. These findings can promote sustainable MMW treatment by enhancing microbial retention and enabling carrier reuse.

University of South Florida

Childhood Home Chaos and Reading Motivation

Cory Balon

Dr. Rasheda Haughbrook

Various contextual factors influence children's academic development and are the subject of extensive research. The purpose of this study is to expand the research of chaotic home environments in relation to reading motivation. Participants included children from the Florida Twin Project on Reading (Hart et al., 2021; n = 390) aged 9 to 11 years. The home environment was assessed with the Confusion, Hubbub, and Order Scale (CHAOS). Motivation was assessed using the Motivations for Reading Questionnaire (MRQ). Pearson's correlation and regression analyses were performed to determine the relation between a chaotic home environment and reading motivation. Supplemental group analyses were performed to determine if differences in home chaos and reading motivation based on academic achievement were present--with groupings categorized by 'A', 'B', or 'C' gradings, with between-group differences based on motivation and chaos separately. Results indicated a weak but significant relation between home chaos and certain motivation variables. However, significant differences were observed between groups regarding reading motivation for those achieving an A compared to those with a B or C. No differences were observed in chaos ratings among

the three groups. These findings emphasize the complex relation between academic achievement and motivation in the context of a chaotic home environment. While a strong relation between chaotic home environments and reading motivation was not found, the results suggest that higher-performing students may have higher motivation. Future research should focus on the contextual mechanisms underlying motivation differences and how to enhance motivation in children from more chaotic backgrounds.

Florida State University

Sub-therapeutic Concentrations of Antibiotics Induce Prophage-driven Superinfection Exclusion and Fitness Cost in Pseudomonas aeruginosa.

Cristian Puente

Daniel Czyz

Bacteria can naturally produce antibiotics within their native soil environment, but often at sub-inhibitory concentrations; consequently, the exact role of antibiotics within bacterial native communities remains unknown. We have shown that subtherapeutic quantities of naturally occurring antibiotics can induce the Pseudomonas prophage Pf4, and superinfection of Pseudomonas aeruginosa cells by this phage leads to their reduced virulence, as demonstrated by impaired twitching motility, compromised macrophage evasion, and increased killing by macrophages in vitro. Thus, the production of subtherapeutic concentrations of antibiotics by environmental microbes may provide the producers an evolutionary advantage associated with reduced fitness induced by prophages in the competing bacteria. Collectively, these results reveal the role of naturally occurring antibiotics in altering fitness by phage-mediated superinfection exclusion and provide potential clinical implications in the application of phage therapy.

University of Florida

The Relationship between Respect for Authority Figures and Opioid Misuse Among Justice-Involved Adolescents

Dahlia Williams

Dr. Micah Johnson

The opioid epidemic is a public health concern that impacts individuals of all ages, including adolescents in the juvenile justice system. Prevention efforts should consider potential factors that may predict opioid misuse (OM). Prior literature finds that respect for authority figures influences a child's behavior, however, the relationship between respect for authority figures and OM among justice-involved adolescents (JIA) has yet to be examined. This study aims to fill this gap and hypothesizes that greater respect for authority figures reduces the risk of OM. To test the hypothesis, a multivariate logistic regression was employed on a sample of 79.960 JIA from the Florida Department of Juvenile Justice. The Positive Achievement Change Tool (PACT) provided the variables used in the analysis. Odds ratios calculated the strength of the relationship between respect for authority figures and OM. Justice-involved adolescents who reported defiance or hostility toward authority figures had 4.22 odds greater OM compared to those who reported respect for authority figures. Furthermore, the odds ratio increased as the level of hostility and disrespect for authority figures increased. This study suggests that an elevated respect for figures of authority might mitigate the likelihood of opioid misuse among justice-involved adolescents. The reinforcement of respect is conceivable, thereby offering the possibility of its integration into the development of interventions or inclusion in treatment programs aimed at fostering respect for authority figures.

University of South Florida

Cost-Effective Device for Monitoring Postural Control in Lower Extremity Rehabilitation

Damien Krech & Jesse Mitchell

Dr. Juan Aceros

Innovative Cost-Effective Device for Monitoring Postural Control in Lower Extremity Rehabilitation

Damien Krech, Jesse Mitchell, Guilherme Cesar, Grant Bevill, Juan Aceros

Injuries to the lower extremities, such as ACL or MCL damage, often require physical therapy and rehabilitation exercises. Monitoring how these individuals interact with the ground allows therapists to evaluate improvements or changes in postural control. Traditionally, this analysis has been limited to research laboratories or large rehabilitation hospitals, where costly research-grade force plates are available to measure the Center of Pressure (COP). This research presents a cost-effective, patient-friendly alternative for COP monitoring. The device consists of a quadrature of strain gauge sensors wired in a half-bridge configuration to a differential amplifier. The signal from the amplifier is then supplied to a microcontroller for storage and post-processing. This electronic setup is embedded in a 3D-printed

housing, coupled with a compression spring that provides instability to test the patient's dexterity. A prototype has been fabricated and benchtop tested with weights, demonstrating its feasibility. Currently, the device is undergoing testing with calibrated research-grade force plates to evaluate its accuracy, precision, and response time. These tests are crucial for validating the device's performance against established standards. Following these evaluations, the next phase will involve testing with human subjects to assess its practical application in real-world scenarios. This step is essential to ensure the device's reliability and effectiveness in monitoring postural control before being deployed for rehabilitation exercises.

University of North Florida

Magnetic Sensor with Enhanced Sensitivity for Biosensing and Healthcare Monitoring

Dan Luu

Prof. Manh-Huong Phan

Magnetic sensors are widely used in biosensing applications for their ability to detect minute magnetic signals with high precision and reliability. Enhancing their sensitivity is essential for improving detection limits, minimizing sample requirements, and broadening their range of applications. This study focuses on improving the performance of a magneto-LC resonance (MCLR) sensor by incorporating magnetic wires into its design. The sensor employs a magnetic coil-based configuration that combines the giant magnetoimpedance (GMI) effect with an LC-resonance circuit to achieve high sensitivity. By increasing the number of magnetic wires within the coil, the sensor's sensitivity can be significantly improved. This advancement opens up new possibilities for real-time healthcare monitoring of respiratory and cardiovascular conditions, detecting biomolecular interactions, and identifying cancer cells or other biomolecules.

University of South Florida

From Historical Legacies to Long Lasting Peace: Reforms to Combat Inequality in Latin America

Dana Rojas

Daniel Beugnet

Issues such as inequality and violence have taken hold of Latin America. Today, the region is experiencing the legacy of imperialism and colonialism, a reality that has left a long lasting mark. These historical factors have contributed to problems that have hindered both the economic and social development of Latin America. The key lies in fostering a solution, a source of hope for the population. The answer is not in violence but in peace. Given the social challenges surrounding Latin America, lasting peace must be implemented through a precise methodology. This article outlines the characteristics of this peace approach, a bottom-up approach. The true salvation from violence begins by empowering ordinary citizens and making them the protagonists in shaping their own peace process.

Tallahassee State College

Utilizing Photorealistic 3D Tiles for Immersive Streetscape Modeling and Urban Planning

Dana Smith

Jinwoo Jang

Photorealistic 3D Tiles (P3DT) offer transformative opportunities to enhance our understanding of streetscape infrastructure, including buildings, roads, and vegetation, through high-resolution 3D mapping. This technology facilitates the creation of high-fidelity, immersive streetscape environments, advancing human-centered infrastructure design and optimizing functionality. The primary objective of this project is to develop a 3D digital twin—a geographically aligned, photorealistic, and immersive representation of real-world streetscapes.

The project focuses on creating detailed renderings that capture the intricacies of buildings, roadways, and pedestrian infrastructure. This was achieved by integrating tools such as the Google Maps API, P3DT, Blender, and Unity. The workflow began with modeling buildings in Blender, using OpenStreetMap (OSM) data, Google P3DT, and real-world terrain. OSM data provided essential details like building locations, road layouts, railway alignments, and forestry placements, ensuring precise arrangement of components. Each model was refined to achieve high visual accuracy.

Roads and sidewalks were designed by tracing OSM's road outlines. Once modeling in Blender was complete, components such as buildings, roads, and sidewalks were exported to Unity. Unity's platform enabled advanced simulations, including traffic modeling, predictive analytics, and agent-based interactions. These features bridged the gap between visual realism and practical application, creating immersive, functional 3D virtual streetscapes.

This project showcases the potential of P3DT to revolutionize streetscape modeling, offering

innovative solutions for urban development and next-generation infrastructure design.

Florida Atlantic University

Grandparenthood as a Means of Social Interaction and its Impacts on Subjective and Objective Measures of Cognition: A Mixed Methods approach

Dana Smith

Dr. Jennifer O'Brien

The transition to grandparenthood marks the potential for a series of novel and engaging social interactions and activities which can stimulate cognitive mechanisms that may protect against decline. The growing literature investigating the impact of grandparenthood on cognition is mixed, with some studies showing that caregiving for grandchildren significantly predicts better cognitive functioning while others find that it can serve as a stressor that decreases cognitive functioning. To address this gap, the current study employed a comprehensive mixed methods approach. Participants were asked to complete a survey regarding how often they interact with their grandchild both in-person and via the phone. This metric was evaluated in tandem with a subjective (Prospective and Retrospective Memory Questionnaire; Smith et al., 2000) and objective (The Montreal Cognitive Assessment; Nasreddine et al., 2005) measure of cognition. Additionally, participants were also asked to describe how they believe their experience as a grandparent may have affected their cognitive abilities. Analyses found over-the-phone interaction with grandchildren to be positively associated with enhanced cognitive performance ($r = .233$, $p = .024$). A reflexive thematic analysis of the qualitative responses found that grandparents characterize their experience as providing opportunities for personal growth and stimulation that they believe positively affects their cognitive health. However, there were instances where difficult circumstances led grandparents to denote their experience more negatively. Ultimately, this study characterized the actions, beliefs, and effects associated with grandparenthood to contribute to the understanding of this complex social relationship.

University of South Florida

The Application of Low-Cost 3D Scanners for Short-Term Documentation of Fossils, Rocks, and Mineral Specimens in Paleontological Digital Collections

D'Angello Polifroni

Tina Kuhn

The use of 3D scanning in geoscience has significantly increased in recent years due to technological advancements. This technology offers numerous benefits across various geoscience disciplines, prompting companies to invest substantial amounts of money in developing the most efficient and accurate hardware and software. High-end 3D scanners can range from $10,000 to $130,000. This project evaluates how a more affordable scanner compares to these expensive options. Specifically, the focus was on the Magic Swift Plus 3D Scanner and its accompanying software, JMStudio. The goal was to assess its accuracy, reliability, ease of use, and overall effectiveness, and determine if it is a viable cost-effective option for schools, museums, and companies short-term. Over the course of two months, a diverse selection of fossils, rocks, and minerals was scanned, providing a broad sampling pool. Various successful and unsuccessful scans were obtained by applying different scanning methods based on size, shape, color, and gloss. It was found that the low-cost scanner was not suitable for short-term use. They lacked clear instructions, making it difficult to learn and operate. While this scanner may have potential for long-term applications, its problems with darker and smaller samples alongside its inconsistent alignment resulted in many unusable scans.

Miami Dade College

Linguistic outcomes of language contact between Quechua and Spanish in Argentina

Daniel Abrill & Sandra O'Connell

Dr. Antje Muntendam

This project intends to study the linguistic outcome of language contact between Quechua and Spanish in Argentina. More specifically, when Spanish speakers ask questions, yes/no-questions in particular, they use a rising intonation, while Quechua uses a falling intonation and the marker -chu. However, due to centuries of intense contact between the two languages, bilingual Quechua-Spanish speakers may be accustomed to using

intonation in both languages or in neither when dealing with this dilemma. So, the question this project seeks to answer is what intonation bilingual Quechua-Spanish speakers use when asking yes/no-questions compared to monolingual Spanish speakers in the Argentine province of Santiago del Estero. For this research project, audio samples were collected from this region from 26 bilingual Quechua-Spanish speakers and 15 monolingual Spanish speakers in which the participants were asked to play a simple card game where they would ask each other yes/no-questions. Afterwards, we analyzed these audio samples in Praat to see what kind of intonation was used in these questions. So far, the results that we are finding reveal that most bilingual speakers tend to continue to use rising intonation in Spanish. In Quechua, most speakers do not use the marker -chu and use a rising intonation as in Spanish instead. Variation among participants is found, which can be explained based on language use and language attitudes. This study furthers bilingualism research in Argentina, which is underexplored, as well as adds onto existing theories of the effects of linguistic contact and language evolution.

Florida State University

Student Reflections on Their Use of Electronic Shared Notebooks in a Large Enrollment General Chemistry Course

Daniel Sebastien

Nicole Lapeyrouse

General chemistry courses have been coined as a "gateway" course and are typically taken within the first two years. Considerable efforts have been made to improve student success in general chemistry courses through pedagogical reform, evaluation of placement exam scores, and support for math prerequisites. Meeting the needs of large student populations (<300 students) is a task that many instructors at higher education institutions seek to address. Implementing group-shared notebooks within classrooms can be an effective tool to fulfill the individualized needs of students. By utilizing electronic shared notebooks, instructors and learning assistants can provide feedback on problems students are encountering as they work through content. The following presentation will focus on students' perceptions of using an electronic notebook in a large enrollment first-semester general chemistry course. OneNote was selected as the electronic shared notebook for this project because this software is available to students through the institution. Students were arranged into small groups to increase student engagement. Students were encouraged to work within their group OneNote inside and outside of class. Teaching assistants were assigned nineteen groups each, which they monitored and provided feedback for. An optional survey was sent to students at the end of the semester. This survey aims to gather feedback on student insight regarding the effectiveness of using an electronic notebook. Free-response questions within this survey will be analyzed through thematic analysis. The results from this study will help foster growth within the education field by exploring a new method for reaching large student populations.

University of Central Florida

Onset of negative magnetic heat capacity due to spin-vibrational coupling in quantum spin clusters

Daniela Zavala

Jason Haraldsen

We examine the effect of spin-vibrational coupling on the thermodynamic and inelastic neutron scattering of a quantum spin dimer. Through a first principles approach, we modulate the exchange interaction between two and three spin-1/2 ions using coupling between a Heisenberg interaction and harmonic oscillator and determine the exact analytical solutions for the energy eigenstates. Using these solutions, we determine the energy excitations and thermodynamic responses for the dimer. In an analysis of the exchange modulation, we find that a second-order effect of the oscillation of exchange interaction produces a distinct negative heat capacity in the dimer. These effects have the potential to provide improved understanding in the areas of spintronics and molecular magnet applications.

University of North Florida

Rolling the Dice: The Cultural Impact of Mass Media on Sports Betting

Darryl Williams

Akeemia Clements

Darryl Williams, *Bethune-Cookman University*

Mass media have influenced the rapid growth of sports betting and how it's become a

normal part of sports culture. From TV broadcasts and online platforms to social media and traditional print, media plays a big role in shaping how people view and engage with sports

betting. It's not just a side activity anymore. It's becoming a core part of the sports experience for many people. This research explores the rise of live sports betting, especially through online streaming, and how mass media contributes to both positive attitudes about gambling, as well as concerns about addiction and harmful behaviors. While sports betting can create excitement and deepen engagement with sports, it's important to recognize the risks involved. This qualitative research project incorporates Cultivation Theory to show how mass media has helped sports betting grow significantly over the years, turning it into a commercialized and widely accepted activity. The findings also point to some serious concerns, like rising gambling addiction, the involvement of younger audiences, and ethical issues around advertising. Media and regulators need to work together to ensure that gambling is promoted responsibly, with safeguards in place to protect vulnerable groups and prevent addiction. At its core, mass media's role in sports betting has made betting more mainstream and accessible, it also has a responsibility to promote it ethically and ensure that the risks are addressed.

Bethune-Cookman University

Reviving The Arcade Culture

David Andino & Jason Markins

Jason Markins

This project is a part of the research I've been doing into a local gaming community, specifically into the ways in which community members work to preserve both the culture and technology of traditional video game arcades. With the rapid growth of technology getting faster each day, it's easy for older cultures within the gaming community to be left behind. What I'm studying is how this older and vibrant culture is being preserved, and what strides are being made to keep this scene and its memories alive. Through this process I've made deep connections with the community. For my research, I have drawn from participatory ethnography research and conducted interviews, recorded observation notes, and competed in several gaming tournaments. What I hope to find from this are the ways in which business owners/arcade owners keep the culture alive. From what I've found this can be done by importing things from other countries, community donations, and by having the community engage with older games. This research is significant because it allows us to better understand how communities tied to aging technologies can preserve their culture. In this process we are able to create a new, inclusive space that appeals to a new generation of gamers while also working to preserve outdated machines, share knowledge of older games, and create a physical space where people can come together to play video games at a time when gaming is constantly becoming a more online, isolated experience.

Eckerd College

Artistic Representation: Dialogue of Themed Design for Prosthetics

David Cardona

Dr. Albert Manero

Congenital limb differences are present in approximately 5 in 10,000 children, with many rejecting prosthetic devices (Vuillermin et al., 2021). Among pediatric users, a lack of aesthetic appeal is a significant factor contributing to rejection (Wagner et. al., 2007). To address this, Limbitless Solutions cultivates collaboration between users and designers to understand individual visions for personalized prosthetics, reducing the likelihood of rejection. This research explores the principles of effective theming, emphasizing artistic representation and user collaboration to create tangible outcomes from unique concepts.

This proposal outlines an iterative design process for creating uniquely themed cosmetic sleeves, progressing through four stages: theme analysis, concept art creation, experimental paint development, and actualization. Instrumental to this methodology is the active participation of users and a focus on translating preferences into tangible artistic outcomes. Select pieces are displayed in the Franklin Institute's Body Odyssey exhibit.

This creative research was applied to the development of four uniquely themed cosmetics to showcase the iterative experience. The first integrates UV reactive paint to emulate the fluorescent patterns under black light in an arcade. In the next, a light-sensitive color shifting pigment and stencils are used to mimic comic stylization. The third draws inspiration from lava lamps using a glow-in-the-dark paint additive, organic shapes, and fluorescent colors to achieve visual contrast. The final design employs weathering techniques modeled off character armor design. By integrating user preferences into the design process, this research demonstrates how effective theming of personalized prosthetics can reduce rejection rates.

University of Central Florida

Examining Hope as a moderator between Racial Microaggressions and Anxiety in Black Students attending Predominantly White Institutions

David Frazier

Nicholas Reese

This study examines the relationship between racial microaggressions and anxiety levels among Black students attending Predominantly White Institutions (PWIs), with hope investigated as a potential moderating factor. The research addresses critical gaps in anxiety research for Black populations, particularly given the increasing prevalence of anxiety disorders and the unique stressors faced by Black college students. Using Racial Battle Fatigue theory and Snyder's Hope Theory as theoretical frameworks, the study employs a correlational cross-sectional design to investigate two primary research questions: (1) whether the frequency of racial microaggressions is associated with anxiety levels in Black college emerging adult students at PWIs, and (2) if hope moderates the relationship between racial microaggressions and anxiety levels. The study controls for ethnicity and first-generation status, as these variables have been shown to interconnect with both racial microaggressions and anxiety in Black populations. This research aims to contribute to the development of culturally tailored interventions and expand the empirical understanding of anxiety in Black college students, addressing a significant gap in mental health literature and practice. The findings have important implications for Health Service Psychology practitioners working with Black college students and could inform more effective, culturally-sensitive treatment approaches.

Florida State University

Exploring the Mechanical and Structural Properties of Bombyx mori Hydrogels Formed by Electrogelation

David Phuong Tran

Dr. Whitney Stoppel

Hydrogels derived from biomaterials have gained significant attention in medical applications due to their biocompatibility, biodegradability, and biomimetic properties. Current applications include tissue scaffolding, wound healing dressings, cell culture systems, and drug delivery systems. Initial work demonstrated the formation of hydrogels (e-gels) from Bombyx mori silk fibroin solution through application of a direct current across an electrolytic cell. Application of the electric current resulted in the decrease in local pH, below the isoelectric point (~4.2), inducing gelation. However, prior work has not extensively explored the parameter space available to optimize e-gels for biotechnology. Parameters that influence the formation of e-gels include pH, the voltage applied, the structure and design of the electrogelation cell, and the starting polymer properties (e.g., molecular weight, concentration). To form our e-gels, we prepare silk solution, incubate at 60 °C, and apply direct current across electrodes, resulting in a reduced pH and gelation. We utilize several methods to characterize the solutions and e-gels formed, focusing on structure and mechanical properties as a function of the formation parameters. We visualize the e-gel structure using SEM and capture the transparency and protein structure within the e-gel using spectroscopy (absorption, FTIR). We measure the mechanical properties of the e-gels using shear rheology. With this data, we will be able to characterize the e-gels as a function of the formulation parameters and methods used. Future work aims to expand our characterization skillsets to include evaluation of these samples over time and evaluation of e-gel microstructure using atomic force microscopy.

University of Florida

Explore or Exploit? The Impact of Different Coordination Structures on Team Performance.

David Switzer & Brooklyn Olesen

Daniel Griffin

Despite the central role of coordination in team performance, little effort has been made to define the types of coordination processes beyond implicit and explicit collaborative coordination. We propose the investigation of two categories of coordination: (1) Explorative: information seeking and (2) Exploitative: information usage. To take this a step further, we will also analyze how a team's goal orientation is related to their coordination processes. A team can be oriented toward two goals: (1) Learning Goals, which aim to collect information and reduce team ambiguity, and (2) Performance Goals, which seek to act on this information to seize opportunities. Due to their nature, we hypothesize that (1) teams who use explorative coordination during periods of learning goal orientations will have higher team performance, and (2) teams who use exploitative coordination during periods of performance goal orientations will have higher team performance outcomes. To test this theory, we will examine archival and participant data from high-fidelity

virtual combat simulations (HFVCS) collected from the multiplayer first-person shooter game Counter-Strike 2. Tracking key player/team attributes as each game progresses will demonstrate how different goal-orientation motives influence the relationship between coordination strategies and overall performance. These findings will inform simulated and in-person teams about approaching coordination strategies across variations in a team's goal orientation. The interplay between these three variables could be persistent across various teams. We urge future research to explore this concept across other team landscapes.

University of South Florida

Effects of Process Parameters and Annealing on Mechanical Properties of Fused Filament Fabrication Ultem 9085

David Trosclair & Carson Rogers

Jutima Simsiriwong

Ultem 9085 is a high-performance thermoplastic widely used in fields such as aerospace, the chemical industry, and medical equipment due to its exceptional thermal and mechanical properties. Ultem 9085 is often implemented in Fused Filament Fabrication (FFF) 3D printing processes to manufacture parts. This study explores the effects of various FFF process parameters and post-processing annealing on the mechanical properties of Ultem 9085, with a specific focus on tensile strength, modulus of elasticity, and elongation at break. Different FFF processing conditions, including chamber/nozzle/bed temperature, nozzle size, raster angle, raster speed, and annealing temperature, were systematically varied to investigate their influence on the material's mechanical behavior. Research indicates that optimizing these process parameters and applying an appropriate annealing treatment significantly improve the material's tensile strength, stiffness, and overall structural integrity. The findings provide valuable insights for optimizing FFF Ultem 9085 in applications that demand superior mechanical properties, which could have a lasting impact on the future of several fields requiring specific material characteristics.

University of North Florida

Using Bioinformatics to Explore NS5 Pockets in West Nile Virus for Future Flavivirus Antivirla Drug Development

Dayanara Leyva

Jessica Liberles

The rapidly emerging viral threats in Flaviviridae pose increasingly growing concerns as anthropogenic activities expand the geographic range of vectors like mosquitoes and ticks. This expansion brings viruses to areas with populations previously unaffected and possibly unprepared for outbreaks, highlighting the need for focused efforts on treatment development to address public and global health threats. Treatments currently presented through flavivirus vaccines introduce issues in the manifestation of antibody-dependent enhancement (ADE). Currently, there are no reported treatments for West Nile Virus (WNV) in humans, and reports of ADE with pre-existing treatments, such as Japanese Encephalitis Virus vaccines. This research's main objective is to provide viable drug target candidates with strong potential for developing broadly neutralizing antiviral drugs, using WNV as a prototype virus. The focus is on antivirals to avoid potential ADE reactions and directly target the virus, as vaccines depend on antibodies present in the body. Using bioinformatics tools, we highlighted the AlphaFold-generated WNV model to have two promising candidate pockets. Both are promising due to their low evolutionary rates, high model confidence, and low intrinsic disorder. A drug targeting these may have longer efficacy as the protein is not evolving quickly. Regarding future drug modeling, the selection of WNV presents as a promising prototype virus for a broadly neutralizing antiviral target against flavivirus, with it being closely related to other viruses in the family. Thus, applications can be further manipulated for other flaviviruses. Future objectives would be to pursue empirical research while navigating possible ADE reactivity.

Florida International University

Describing E-Health Literacy and Technology Use Habits Among Low-Income Community-Dwelling Older Adults

Dea Chovatia

Ladda Thiamwong

The use of technology within the healthcare field is rampant, as most doctor-patient communications

and medical records (MR) have shifted from manual methods to digital E-health systems. Low-income older adults (LOA) that are accustomed to manual methods of accessing and communicating healthcare information and decisions may not be utilizing newer technologies due to a lack of E-health literacy. However, it is currently unclear how LOAs interact with technology in the healthcare space. This study aimed to investigate e-health literacy and technology use behaviors in community-dwelling LOAs. In a sample of 314 LOAs (Age:74.8±7.3years, Female: n=266 (84.7%), BMI: 30.0±6.4kg/m2), adequate and inadequate e-health literacy was measured using the Short Assessment of Health Literacy questionnaire, and LOAs self-reported technology use behaviors via the Access to Health Services questionnaire. Descriptive and frequency analyses were conducted using jamovi, and data are presented as mean±standard deviation. In the past 12 months, 96% of participants reported seeing a healthcare professional and using ongoing healthcare, yet only 35.7% accessed their online-MR at least once during the same timeframe. Although 71.8% of participants reported that they do not have access to MRs, 82.4% reported that their doctors keep their MRs online, indicating that many LOAs may not know how to access their online-MR. Most participants (87.3%) had adequate e-health literacy, with a mean score of 16.0±2.5. These findings suggest that many LOAs have sufficient e-health literacy but lack access to their online-MR. Healthcare providers may need to demonstrate and explain how to access online-MR for their LOA patients.

University of Central Florida

Analyzing Rates of Suicidality and Substance Use Disorder in Justice Involved Adolescents with ADHD

Deborah Remarais

Dr. Micah Johnson

Substance Use Disorder (SUD) is a critical issue affecting the health and well-being of Justice Involved Adolescents (JIAs), a population at elevated risk for mental health challenges, including suicidality. This study aims to fill noticeable gaps in the literature in this population by investigating the relationship between ADHD diagnosis, SUD, and suicidality among nearly 80,000 JIAs in Florida. Utilizing data from the Florida Department of Juvenile Justice, the Positive Achievement Change Tool (PACT) was used to assess factors such as mental health, substance use, and demographics at intake. The research hypothesized that JIAs diagnosed with both ADHD and SUD would have higher odds of suicidality compared to those without SUD. Using Logistic regression analyses while stratifying by SUD, the results of this study revealed that JIAs diagnosed with ADHD had approximately three times higher odds of suicidality than those without ADHD when no history of SUD was reported. Among JIAs with a history of SUD, those with ADHD had more than twice the odds of suicidality. Female-bodied adolescents with or without SUD had notably higher odds of suicidality reporting over twice the odds of suicidality also. Additionally, JIAs from households with medium incomes (between $15,000 and $34,000) exhibited increased suicidality, consistent with existing research. These findings underscore the heightened vulnerability of ADHD-diagnosed JIAs, particularly in the context of SUD. Future research in this area is needed to identify mediating factors, particularly for female-bodied JIAs, including mental health status and access to care, to better address the needs of this population.

University of South Florida

The Effects of Positive Versus Negative Framing on Risk-Taking Behavior in Decision-Based Tasks

Deepthi Prince

Dr. Patrick Cooper

The framing effect, a psychological phenomenon in which decision-making is influenced by how information is presented, is crucial in understanding human behavioral patterns under risk. This study examined the influence of positive versus negative framing on risk-taking behavior within a medical context. This study hypothesized that participants presented with a positive frame would display lower levels of risk-taking behavior, while participants presented with a negative frame would display higher levels of risk-taking behavior. Participants in this study were presented with two different medical treatment options in response to their hypothetical life-threatening illness. The treatment options were described using positive framing (emphasized potential success) or negative framing (emphasized potential failure) language. Participants were then asked to answer questions to assess their decision-making process. These questions measured participant preference, confidence, and self-awareness of influential cognitive factors in pursuing a treatment option. Data collection is currently ongoing; however, it is anticipated that both framing conditions will significantly affect participants' risk-taking behaviors, in accordance with the hypothesis.

This research further contributes to the literature evaluating the influence of framing effects in medical decision-making processes. Furthermore, since decision-based tasks are largely persistent within the healthcare field, the results of this study may provide greater insights into how to eliminate the effects of framing on individual choices when risk is involved in healthcare treatment plans.

Nova Southeastern University

Identifying risk factors in adolescence that contribute to metabolic syndrome in Asian Americans using the National Longitudinal Study of Adolescent to Adult Health

Deidra Newvville & Dev Patel

Dr. Joy Scheidell

Metabolic syndrome (MetS) is a cluster of risk factors that significantly increases the likelihood of type 2 diabetes and cardiovascular disease. The consensus definition of MetS incorporates criteria from the International Diabetes Foundation, the American Heart Association, and the National Heart, Lung, and Blood Institute and consists of elevated waist circumference, elevated triglycerides, low HDL cholesterol, high blood pressure, and high fasting blood glucose levels. Three of five criteria are needed to establish MetS. Despite having lower average BMIs, Asian Americans exhibit a disproportionately higher prevalence of MetS compared to other ethnic groups. This study utilizes data from Waves I (1994-95, ages 11-18), III (2001-02, ages 18-26), IV (2008-09, ages 24-32), and V (2016-18, ages 33-43) of the National Longitudinal Study of Adolescent to Adult Health, to explore early-life and adulthood dietary and lifestyle risk factors associated with MetS. We will identify participants who meet consensus MetS criteria, based on biomarker and anthropometric data during Waves IV and V. We will identify potential MetS risk factors using survey data measured in Waves I and III and use multivariable logistic regression to estimate associations between risk factors and MetS to identify common and unique risk factors across racial and ethnic groups. We expect to uncover specific dietary and lifestyle risk factors that contribute to the high prevalence of MetS in Asian Americans. These findings will provide a foundation for public health strategies aimed at reducing metabolic health disparities among Asian Americans.

University of Central Florida

Assessing the Effect of Elevation Above Substrate on Coral Outplant Growth

Delaney Deinlein

Dr. Radleigh Santos

Coral reefs are severely damaged, especially along the Florida reef tract, and one of the primary methods of restoration is to place healthy coral on degraded reefs to increase biomass. This process, known as outplanting and this project aims to make recommendations for a novel outplanting technique and determine the most effective statistical model of coral growth. One of the most frequently observed hindrances to coral success once placed on a degraded reef is competition with macroalgae, which is favored under current climatic conditions. To attempt to combat this, corals in the treatment group were planted on cement "bases" 5.5 cm tall rather than directly on the substrate, which placed the coral farther from existing macroalgal communities. To analyze the effect of elevation, three regression models were fitted using different techniques designed to illuminate any autocorrelation or fixed-effect structure in the data, and compared in terms of accuracy, significance, computational efficiency, and ease of interpretation. Analysis revealed that the most effective model was multiple linear regression, and that significant predictors included the proportion of the perimeter of the coral impacted by macroalgae, the species of coral, location of the outplant site, and the interaction term for impacted perimeter and elevation. Given the results, we can confidently recommend elevating outplants as a restoration technique on reefs dominated by macroalgae. In future, we aim to assess the long-term effects of elevation on growth and survival, as well as to repeat the comparison of the models after all data has been collected.

Nova Southeastern University

Evaluation of usability and perceptions for a temporalis muscle based EMG wheelchair controller

Delaney Gunnell

Dr. Albert Manero

Amyotrophic lateral sclerosis causes progressive deterioration in motor neurons, which can inhibit independent use of a traditional joystick-based wheelchair (1,3). To improve autonomy in movement, the researchers developed a wheelchair interface controlled by electromyographic signals from the temporalis muscle (2). Users of the interface expressed the

need for a training platform to aid in the training of muscular discretization. Limbitless Journey, a serious video game, was developed as a virtual training platform that simulates the controls required to operate the wheelchair (4). The game's virtual environment minimizes stress and helps practice the flex discretizations, and supports the learning of the wheelchair's temporalis interface (4). For additional autonomy, interaction with the computer interface is done via eye-tracking technology.

In order to evaluate and improve training, both quantitative and qualitative data were collected during a usability study. Quantitative data included the Game User Experience and Satisfaction Scale and the Systems Usability Scale (5,6). These results supported the game's efficacy, showing positive perceptions of the game. Qualitative data was collected using a think-aloud methodology, encouraging users to verbally express their thoughts during gameplay. These recordings were transcribed and subsequently coded into categories such as game environment, user interface interactions, and controller usability to assess user sentiment regarding the game. Positive comments primarily referred to the game environment, while negative perceptions focused on challenges with the flex controller usability. The collected user feedback will be implemented into the desktop and virtual reality version of the game.

University of Central Florida

Testing the effects of salinity and stress conditions on durum wheat for salt-related genes in DNA and differentially expressing to RNA

Demar Williams

Antonette Todd

Durum wheat, or Triticum turgidum, is one of the most cultivated species of wheat used to make pasta. Durum wheat is usually grown in the Northwest United States or Southwest United States deserts. The effects of salinity stress will be tested on durum wheat to determine if salt-related genes are present in its DNA and if they can be differentially expressed in the organism's RNA. Wheat seedlings were germinated in preparation for this study and then were transplanted into soil, where they were watered regularly for four weeks. The plants were subjected to salinity and stress conditions for two weeks. Primers for salt-related genes were screened for DNA genome presence using polymerase chain reaction (PCR), and gene expression levels were measured using RNA converted to cDNA. This study found salt-related

genes present in the DNA, which can be expressed in RNA, and differentially expressed genes under varying salt concentrations. These results can show farmers tools to identify durum wheat varieties outside of their regular environment and encourage growth in different places. This is important because Delaware is located near the coast and has a lot of salt impact The information gained from this study can help expand the general understanding of growing durum wheat in Delaware.

Bethune-Cookman University

Reel Impact: How Bigotry and Racism Affects the Film Industry

Derrick Taylor

Akeemia Clements

This study dives into the long-standing issue of racism in the film industry and how it impacts various aspects of filmmaking. Film is one of the most popular ways to tell stories, but when it comes to representing diverse communities on screen and giving opportunities to people of color behind the scenes, there's still a lot to be desired. While progress has been made in recent years, issues like stereotyping, underrepresentation, and systemic barriers in hiring and production remain persistent problems. The research highlights how racism's impact on the film Industry is both historical and ongoing. It affects everything from who gets cast and what stories are told, to who gets hired behind the camera and how the industry recognizes talent. The study begins with the idea that racism in the film industry operates in complex and deeply rooted ways, making it difficult for people of color to secure jobs or tell their stories. To dig deeper, the study uses Qualitative Research Methodology and incorporates the Magic Bullet Theory, which looks at how media messages can directly influence audiences. The findings reveal several ways racism continues to shape the film industry and its effects on filmmakers and their work. While there has been progress, the industry still struggles to overcome the systemic racism that has shaped its history. Moving forward, the challenge for the film industry is to dismantle these barriers and create more opportunities for diverse voices to thrive, both on-screen and behind the scenes.

Bethune-Cookman University

Examining Students' Responses to Biochemistry Creative Exercises

Dev Chary

Erin Saitta

Authors: Dev Chary, Yulia V. Gerasimova, Christopher Nix, Erin K. H. Saitta

Biochemistry is an important foundational course for students entering a variety of careers. However, mastering biochemistry content is challenging as it requires connecting topics from multiple subjects and transferring knowledge learned in prerequisite courses. Thus, investigating strategies to assist in building knowledge from existing knowledge could lead to greater student success and confidence. This study explores the use of a student-centered assessment, Creative Exercises (CEs), in a biochemistry II course. CEs are open-ended questions in which the student may write statements that fit under a general prompt/concept. We qualitatively analyzed written responses from 31 biochemistry students and categorized their responses. Findings from this analysis provide a better understanding on how students recall and link concepts to build new knowledge in biochemistry.

University of Central Florida

Pilot Study-Relationship identification between triggers and electrophysiological changes in the brain and the overall human electrophysiology during migraines

Dominic Sandell & Zachary Readdick

Dr. Alesha Fleming

This Pilot Study is meant to prepare and expand the research team of the research project "Relationship identification between triggers and changes in the brain and the overall human electrophysiology during migraines". The research project aims to reinforce that migraines have environmental triggers, establish that migraines cause changes in the brain's electronics and the body's overall electrophysiology, and define the relationship between the changes and the triggers. The hypothesis is that there is a relationship between environmental triggers and specific electrophysiological changes in the brain and overall human electrophysiology. This Pilot Study will mimic the electrophysiological tests that will be completed in the main project. These tests will be an Electroencephalogram (EEG), Electrocardiogram (ECG), Galvanic Skin Response GSR, and pulsometer. By performing these tests, the researcher will be able to refine their skills in preparation for the main project. Additionally, the participants in this study will be Aerospace Physiology students since there is a standing IRB for the Anatomy and Physiology Lab for Aerospace Physiology students. Furthermore, the students who are receiving these tests will also have the opportunity to perform these tests on others. The students will be observed and graded on their skill level, and then the PI and Research Mentor will invite two to five individuals to join the main project.

Embry-Riddle Aeronautical University

Integration of Semiconductor Nanomembranes into Ortho-K Contact Lenses

Dontavious Ellis

n/a

Orthokeratology (Ortho-K) reshapes the cornea to improve vision and slow myopia progression but is claimed to often face challenges with comfort and inconsistent results. Therefore, this study aims to determine if and how semiconductor nanomembranes can be integrated into Ortho-K contact lenses for a more comfortable, yet efficient use through nanomembrane synthesis. My current web-based research focuses on four major nanomaterials—nanocomposites, carbon-based, metal-based, and dendrimers—analyzing their interactions from previously conducted testing. Once acquired, using a scanning tunneling microscope, the synthesized nanomembranes will first be examined then tested on microscopic lenses and camera lenses, since they have functions similar to the human eye's anatomy. Nanotechnology has the potential to manipulate the way things are arranged using physics that don't apply at any other scale, allowing a change in bandgaps, altering the maximum ability of optoelectronic devices. By leveraging quantum effects to manipulate particle behavior, this approach aims to improve lens performance and potentially pioneer visual bionics.

University of South Florida

Can Invariant Risk Minimization (IRM) overcome shortcut learning?

Duong Xuan Tung Mai

Lawrence O'Higgins Hall

Learned shortcuts and Out-of-Distribution (OOD) data present significant challenges to Machine Learning models, particularly Deep Learned models. Invariant Risk Minimization (IRM) has shown promise in addressing OOD classification

by encouraging the learning of invariant features, such as focusing on shapes instead of spurious (or shortcut) features like colors in the case of handwritten digits classification. In this study, we evaluate the performance of the IRMv1 model under an extreme scenario where color, a spurious feature, is swapped between digits in the training and testing dataset derived from the MNIST dataset of handwritten digits. We investigate to what extent the same digits must retain consistent colors to achieve robust classification using IRMv1. Our experiments demonstrate that keeping a few examples with the same color in the training and testing sets would enable IRMv1 to achieve high accuracy. These findings, validated on our curated MNIST dataset, highlight the potential of IRM in mitigating the OOD challenges and shortcut learning.

University of South Florida

AI-Enhanced Maternal Care: Predictive Models for Maternal Health Risk Factors

Dylan Huston & Roy Chen

Dr. Christina Eldredge

This research aims to improve maternal health outcomes by leveraging artificial intelligence (AI) to develop a predictive model identifying critical health risk factors during and after pregnancy, focusing on preventing fatal complications. Minority women disproportionately experience adverse conditions due to substandard care and limited resources. The study seeks to identify significant risk factors for inclusion in an efficient predictive model suitable for low-resource settings, addressing: How can AI enhance clinical care to provide timely interventions? Relevant articles were retrieved from databases using key search terms, and 710 articles were double-blind screened with Rayyan software. Articles with a majority of inclusion votes were included; others were further evaluated. Most studies used retrospective designs with data from hospitals, universities, or databases. While offering large sample sizes, these studies may have biases due to underrepresentation of minorities; techniques like oversampling enhance representation. Common parameters for AI models include demographic data (maternal and gestational age, socioeconomic status) and clinical parameters (blood pressure, BMI, pregnancy history, diabetes, infertility). Deep learning architectures like convolutional neural networks (CNNs) and recurrent neural networks (RNNs) with Long Short-Term Memory (LSTM) units are explored for predicting pregnancy outcomes. Evaluation metrics include area under the curve (AUC), accuracy, and precision. This research contributes to health informatics and AI in healthcare, aiming to benefit lower socioeconomic populations and reduce mortality rates. Future work involves creating a deep-learning predictive model based on identified parameters, training it with patient data, evaluating its performance, and integrating it into healthcare workflows to save maternal lives.

University of South Florida

Large Language Modeling predictions of Missense Variant Effect via 3D Protein Structure

Dylan J. Tan

Dr. Xiao Fan

The clinical genetic testing pipeline has become essential in modern healthcare, allowing for identifying genetic variants that can impact patient diagnosis and treatment. However, a critical bottleneck exists in the pipeline as determining the clinical relevance of these variants remains a significant challenge and impediment to the clinical genetic testing pipeline's efficiency. Our project uses advanced computational methods to address the low-throughput variant interpretation bottleneck in the clinical genetic testing pipeline. Leveraging a large language model and a protein 3D structure prediction model, we aim to improve predictions of genetic variant effects. Our ablation study showed little difference in the model performance with and without protein 3D structure information on a ClinVar dataset. We achieved an AUROC score of 0.86 for both models. Alternative approaches incorporating protein 3D structure will be explored in the future.

University of Florida

The Relationship of Taste Reactivity Behaviors and Fos-Immunoreactive Neurons in the Gustatory Cortex Elicited by Intra-Oral Infusion of Mixtures of Sweet and Bitter Tastes

Elayna Rauscher

Michael King

While the effects of single-taste stimuli on behavior and neural activity have been studied extensively, less is known about the effects of mixtures. Therefore, we examined the effects of bitter, sweet, and mixtures of the two on taste reactivity (TR) behaviors and the number and location of Fos-immunoreactive (Fos-IR) neurons in the gustatory cortex (GC). After recovering from the insertion of intra-oral cannulas, 18 male

Wistar rats received an intra-oral infusion of 1.0M sucrose, 3.0 or 1.5mM quinine (QHCl), or mixtures. TR behaviors were videotaped and counted, and Fos-immunohistochemistry was performed on brain sections throughout the GC. Results indicated that QHCl alone elicited more Fos-IR neurons throughout the rostral-caudal extent of the GC and more aversive and fewer ingestive TR behaviors than sucrose alone (p's<0.05). For the mixtures, 1.0M sucrose+1.5mM QHCl elicited TR behaviors and Fos-IR neurons in the GC that were more like sucrose than QHCl. Similarly, mixtures with 3.0mM QHCl caused TR behaviors and Fos-IR neurons that were more like QHCl alone. However, between the two mixtures there was no difference in the number of Fos-IR neurons throughout the GC when behaviors changed from predominantly aversive to ingestive. Therefore, the number of active neurons in the GC may not need to change to alter TR responses to mixtures. Instead, it possible that the pattern of activity or connectivity of neurons activated by different tastes potentially determines the behaviors performed. Future research could explore how these neurons functionally connect within and beyond the GC.

Stetson University

Prevention Is Power: The Misinformation Of HIV/AIDS in the Media

Elfridge Arthur

Akeemia Clements

This study takes a close look at how media misinformation has affected awareness, public perception, and behaviors related to HIV/AIDS. Over the years, the media have played a huge role in shaping how people view the virus, the disease, and those affected by it. While medical improvements in HIV/AIDS have come a long way, misinformation is still a problem across various platforms, and it continues to fuel stigma, discrimination, and risky behaviors. The research dives into how these inaccuracies in media coverage have shaped societal attitudes and responses to the epidemic in harmful ways. The main idea behind the study is that misinformation doesn't just spread confusion but impacts how individuals such as vulnerable groups are affected, often facing stigmatization and harm because of how the media portrays HIV/AIDS. Using qualitative research methodology, this study applies the framing theory, which examines how information is presented and influences people's understanding and reactions. The findings showcase that media misinformation about HIV/AIDS has been not only inaccurate but also stigmatizing and damaging to public health efforts. Despite progress made in raising awareness and improving education about the disease, misinformation persists, and it has real consequences for public health. In conclusion, to combat the stigma and reduce harm, sources such as media outlets, and health organizations need to prioritize accurate, inclusive, and compassionate information about HIV/AIDS.

Bethune-Cookman University

Trade Wars and Domestic Gains? An Analytical Model of U.S. Tariff Policies

Elias Rodriguez

Ransford Edwards

Global trade dynamics are being re-shaped by tariff policies, which influence economies, industries, and diplomatic relationships. In this research we use a simulation-based model to analyze the economic and diplomatic impacts of upcoming proposed U.S. tariffs on imports from Mexico, Canada, and China. Our study explores how these tariffs could reshape trade volumes, impact domestic production, and provoke retaliatory measures from the affected countries. By integrating economic principles such as price elasticity and international trade theories, the model predicts shifts in trade patterns, industry-specific responses, and macroeconomic outcomes over a five-year period.

Key findings highlight the potential for reduced imports, moderate increases in domestic production, and proportional retaliatory tariffs, which could escalate trade tensions globally. Additionally, the model examines how these policies might strain diplomatic ties and disrupt global supply chains, emphasizing the interconnectedness of economic and political systems in the world today.

This study contributes to policy discussions by providing a quantitative framework for evaluating the impact of tariffs in real time, offering insights for policymakers navigating the complexities of protectionism and international relations. By bridging economic modeling with trade policy analysis, the research aims to facilitate informed decision-making in an increasingly globalized world. This research underscores the importance of balancing economic goals with diplomatic stability, aiming towards policies that are sustainable and equitable.

Using an interdisciplinary approach, we aim to make the research valuable to economists, political

policy makers, data scientists, and others interested in understanding the ripple effects of trade policy changes.

Nova Southeastern University

Unraveling the Microbial Diversity of Freshwater Ecosystems Under Environmental Pollution

Elik Esquilin

Tammy Laberge, Ph.D.

Increasing pollution levels are disrupting ecosystems worldwide including microbial ecosystems. As bacteria are foundational for life, playing vital roles in ecosystem stability by conducting various biogeochemical cycling processes, investigating the effects of pollution on bacterial microbiomes is crucial for developing strategies to counter pollution's impact. This study focuses on understanding pollution's influence on bacterial ecosystems by collecting environmental DNA (eDNA) from urban and rural waterways and conducting DNA metabarcoding through DNA Subway. This research seeks to identify bacterial diversity and abundance across the different sample sites and discern significant variations in composition. Our current results reveal common foundational biogeochemical cycling bacteria as well as photosynthetic cyanobacteria across both urban and rural samples. Additionally, several urban sites revealed an overabundance of fecal bacteria, in turn, these same sites were found to be less diverse and abundant in bacteria when compared to the other urban and rural sites which were surprisingly similar. By illuminating the complex relationship between pollution and bacterial biodiversity, this study aims to inform the development of proactive measures to mitigate the spread of pollution, protect South Florida's waterways, and preserve our diverse ecosystems.

Miami Dade College

Analysis of Forensic Science Student Anxiety Levels When Exposed to Forensics Visual Stimuli Tasks via the Evaluation of Galvantic Skin Response.

Elisa Guerrero

Dr. Christopher Randles

Anxiety is the response that humans have when exposed to a trigger. It can be caused by a multitude of factors such as psychological, biological, or physiological stimuli. Anxiety can be presented as a state or as a trait in a person. Trait anxiety is typically seen as a more stable personality trait, whereas state anxiety is a more intense temporary emotional state. Anxiety will be regarded as a more state-like characteristic. This study used a GSR (Galvantic Skin Response) Shimmer3+ device to measure skin changes of electrical properties. In a situation where a participant is experiencing anxiety, levels of sweat secretions and electroconductivity will increase. In this study, participants were attached to a GSR device whilst performing forensics related tasks. Participants were also audio and video recorded. The objective was to confirm a method to measure the anxiety felt by college students when exposed to educational stimuli. Data was collected from participants through a think aloud protocolled interview. During the interview,participants were asked to identify fingerprint ridge features between a database print and a fingerprint lifted from a crime scene, and identify if the prints were the same. Findings suggested that there was an increase in skin conductivity, therefore indicating an arousal state (e.g. state anxiety). The data from the GSR Shimmer 3+ in combination with other multi-channel data was analyzed, and determined that the GSR Shimmer 3+ is a suitable device formeasuring arousal states and reflected the state anxiety of students when presented with a challenging question.

University of Central Florida

Analysing the Rate of Femicide of Indigenous Women in Rural Australia

Eliza Finnigan

Dr. Hsiu-Fen Lin

Femicide is an increasingly prevalent issue in Australia, with rates continuing to rise, especially among Indigenous women in rural Australia, who face compounded vulnerabilities. This study investigates the relationship between rurality, Indigenous status, and femicide rates from 2018 to 2023. Data will be compiled from various Australian government statistical databases, including the Australian Institute of Criminology (AIC), the Australian Institute of Health and Welfare (AIHW), and the Australian Bureau of Statistics (ABS), supplemented by secondary data collected from the RED Heart Campaign. Descriptive statistical methods will be used to analyze the data, and visual maps will be created to highlight the correlation between rurality and other variables. It is expected that femicide rates will increase with rurality and Indigenous status, with the highest rates found in remote areas of Australia. This research addresses a significant knowledge gap of how the combination of Indigenous status and rurality impact rates of femicide in Australia.

The findings may inform policy development and national frameworks by specifically focusing on the rural factors that increase femicide risk to Indigenous Australian women, combatting the growing presence of femicide in this population.

University of Central Florida

The Effects of Climate Change on the Geotactic Swimming Response of Larval Stone Crabs

Eliza Patty

Philip Gravinese

The Florida Stone Crab supports a $30 million per year fishing industry that may be impacted by coastal climate change. As climate change intensifies, coastal acidification and rising sea water temperatures are altering species' behavior physiology, and reducing their survival. This study determined how larval stone crabs' swimming response to gravity (geotaxis) was impacted by reduced seawater pH and elevated seawater temperatures that mimic end-of-century conditions. Stone crab larvae were raised in singular and simultaneous combinations of reduced pH (pH= 8.0, 7.8, and 7.6) and elevated temperatures (28, 30, and 32) in a fully-crossed experiment. Individual larvae were placed into a clear acrylic tube, which was initially positioned horizontally. The tube was kept in dark conditions and maintained at the experimental temperatures. After an acclimation period, the tube was then rotated vertically. After rotation, we digitally recorded the swimming direction and speed of individual larvae (stage 1 through 5). Larvae showed no difference in their upward swimming speeds. The majority (<65%) of stage 1 and 2 larvae elicited a negative geotaxis (upward swimming). We observed a significant change in swimming behavior in stage 3 larvae with 39% swimming upward at a faster rate in the combined pH and temperature treatment. Later larval stages also oriented downward. Change in the swimming behavior of stage 3 larval stone crabs suggests that stone crab dispersal may become compromised as coastal waters continue to warm and become more acidic.

Eckerd College

How Does the Shape of Sexually Selected Weapons Vary with Body Size in the Insect, Narnia femorata?

Elizabeth Bane

Christina Salerno

Sexually selected weapons, such as deer antlers and crab claws, can vary dramatically within a species. Studies have demonstrated that weapon size increases with body size, however it is not well established how the shapes of weapons change with body size. In the insect Narnia femorata (Hemiptera: Coreidae), males use their enlarged, spiny hind legs to squeeze their competitors, with their spines often digging into and trapping the opposing male. Here we use N. femorata as a model to understand how weapon shape, specifically the area, angle of the spine axis to the femur, and curvature of the terminal femur spine, varies naturally among individuals. We photographed a lateral view of this spine on adult N. femorata and extracted its area, angle, and curvature using ImageJ. We found that the morphology of the spine varied dramatically among individuals, and we found intricate changes in shape that occur as insects get larger. Our results highlight the natural variation of sexually selected weapons which may have consequences for fighting behavior and ultimately their mating success.

University of Florida

Understanding Museum Educators' Sense of Community in the Workplace

Elizabeth Riotto

Dr. Megan Ennes

Informal educational experiences, widely accessed by the public in spaces such as zoos, aquariums, and museums, are developed and facilitated by museum educators. In recent years, in part due to the COVID-19 pandemic, many individuals working as museum educators left the informal education field to pursue alternative careers. Understanding museum educators' working experiences and feelings of belonging within their respective communities of practice is therefore a subject of interest, yet such remains under-researched. This study aims to explore museum

educators' sense of community within both the general museum community as well as the informal education community under a framework of self-determination theory. To investigate this, a survey from Chavis, Lee, & Acosta (2008) was modified and distributed to currently employed museum educators throughout the United States. Select participants that completed the survey then participated in semi-structured interviews to provide qualitative insights into their experiences with belonging as informal education community members. The survey and interview data was analyzed using SPSS and MAXQDA, respectively. Resultantly, a greater understanding of the components, emotions, and actors that contribute to museum educators' sense of community can be gained. Beyond this, it is anticipated that an enhanced understanding of community-based belonging will contribute to efforts to retain more highly qualified educators within the informal education community.

University of Florida

Clue'd in II: Time Competency Perceptions using Clinically-Based Board Games

Ella Porter, Trinity Knight & Rebecca Harper

Patrick Smith

Psychology undergraduates fail to realize the seriousness of time-sensitive judgements on mental health, especially when trained clinicians even make hasty judgements that lead to clients' detriments (Curtis & Kelley, 2023; Hallyburton & Allison-Jones, 2023). To promote awareness of time when making clinical decisions, the current study modified the popular Clue board game, where players could withhold judgements about published case study diagnoses (Barnhill, 2013). The merits of board games for deeper learning have been well studied (Willet et al., 2018), and it was hypothesized that playing a game whose penalties aligned with hasty decision-making would influence perceptions of time management within clinical work. 42 first-year psychology majors completed attitudinal surveys that assessed student perceptions of time for appropriate clinical diagnoses. Participants were randomly assigned to one of two board game groups that varied by the presence/absence of ethical violation cards when making incorrect diagnoses. Participants took five turns where they received symptoms from previously published case studies (Barnhill, 2013), and they were able to guess the diagnosis after each turn. Incorrect guesses resulted in point deductions (and ethical violation cards, in one group). Participants played four weekly rounds of the game, after which they received the same assessment as the pretest (short-term posttest) and again two weeks later (long-term posttest). Results revealed significant changes in perceived time estimations for making correct diagnoses ($ps < 0.01$) in both game groups. These data support a new educational approach that instills the importance of time to make ethically-sound, clinical judgements

Florida Southern College

Creatine Monohydrate Supplementation Increases Skeletal Muscle Microvascular Blood Flow

Ella Vizzini

Dr. Robert C. Hickner

The incidence of cardiovascular disease (CVD) and obesity has risen to alarming levels. An early indicator of CVD is the impairment of skeletal muscle blood flow (SMBF). This impairment is thought to be induced by elevated levels of oxidative stress, otherwise known as reactive oxygen species (ROS). ROS production is escalated by excess body fat, advancing age, and consumption of high sugar meals. NADPH oxidase (NOX) is the primary producer of ROS in the blood vessels that is believed to contribute to CVD. The current project aims to expand on previously funded IDEA grant work by examining the effect of NOX on SMBF muscle in a CVD at-risk population. The main objective of this study is to determine the effect of NOX produced ROS concentrations on SMBF at rest and four hours following meal consumption in older adults who are overweight or obese. Our hypothesis studies the idea that NOX produced ROS concentrations will impair SMBF for the entire four hours post-meal in older adults who are overweight or obese. Participants will visit the laboratory and have up to two microdialysis probes inserted into their muscle to assess in-vivo ROS and SMBF, at rest and up to four hours following the consumption of a high sugar meal. Findings of this study will benefit the at-risk population of overweight and obese individuals by determining risks of CVD and contributing to CVD research to aid in treatment and prevention.

Florida State University

The mouse olfactory bulb receives input from hypothalamic neurons expressing orexin-A and melanin-concentrating hormones.

Ellee Harden

Dr. Douglas A. Storace

Mice rely on their keen olfaction system to interpret and adapt to environmental changes, making

them an invaluable model for studying sensory processing and neurobiological processes. Our laboratory identified a candidate pathway for this process from hypothalamic neurons that express the neuropeptide orexin-A (OXA) and a distinct population that did not. Our preliminary studies showed that the neuropeptide melanin-concentrating hormone (MCH) is expressed densely throughout the bulb. Because MCH is primarily expressed in hypothalamic neurons near those that express orexin, we hypothesized that non-orexin inputs originate from MCH-expressing neurons. To investigate, we injected Cholera Toxin subunit B conjugated to Alexa Fluor 555 (CTB-555) into the olfactory bulb (OB) to trace projecting neurons. Using fluorescence immunohistochemistry with antibodies for OXA and MCH on hypothalamic sections, we confirmed that MCH neurons overlap with CTB, demonstrating that the OB receives projections from MCH-expressing neurons. Confocal microscopy identified cell position and type (CTB, OXA, MCH, CTB-OXA, CTB-MCH). Our preliminary analyses suggest that the mouse OB receives inputs from at least three distinct neuron populations: ~40% that express OXA (~20 %) and MCH (~20 %), and the remainder that do not. Our research outlines hypothalamic communication with the olfactory bulb, linking sensory perception and physiological state. Exploring OXA and MCH's role in this connection may uncover how smell influences arousal and feeding behaviors. Our research may improve understanding of disorders like insomnia or anosmia (loss of smell). This is especially important post-COVID-19, as many experience chronic sensory deficits like anosmia and ageusia (loss of taste).

Florida State University

Analysis of Conserved Domains in Promoters of Differentially Expressed Genes

Emalynn Tobias

Navi Gill

Crop plant response to stress involves changes in gene expression patterns. One of the key steps in understanding changes in gene expression associated with plant's response to stress begins with the identification of "conserved domains" in the promoters of Differentially Expressed Genes (DEGs) since these conserved domains provide binding sites for transcription factors. In this study, we aim to identify the Cis-Regulatory Elements (CREs) in the promoters of DEGs that we have previously identified in the transcriptomic analysis of two rice varieties- Cypress and LaGrue. These two rice varieties are known to perform well and poorly, respectively, under high night temperatures (HNT; 82.4 ± 1˚F or 28 ± 1˚C) based on their ability to withstand heat stress. We hypothesize that the DEGs that are up- or down- regulated by HNT stress, either exhibit a shared set of CREs in their promoters or harbor polymorphic patterns that are common to specific DEG patterns, identification of which can help understand the plant's varied response to stress. We analyzed the promoter sequences using a workflow 'ElemeNT'1 that identifies core promoter motifs, and provides a predicted relative position of each motif relative to the Transcription Start Site (TSS). These core promoter motifs were functionally annotated and will be further evaluated to determine patterns of variation that corelate with the up- and down-regulated genes.

Nova Southeastern University

Orienting GTAs to Stretch-It Questioning using Simulator Training: How can This be Applied?

Emanuella Rose Dolcine

Dr. Erin Saitta

Graduate Teaching Assistants (GTAs) are crucial in developing undergraduate students' knowledge in large research and academic institutions. However, a stronger role in Graduate Teaching Assistant training is a primary concern in chemistry education—specifically, teaching and implementing an interactive teaching strategy. GTAs in chemistry have a strong influential role as they are often tasked with implementing interactive instructional practices in laboratory courses. This study examines how GTAs practice interactive teaching using a mixed reality simulator which has previously been proven to increase GTA proficiency in targeted skills. The interactive teaching strategy called "Stretch-It" was introduced and the GTAs practiced the strategy in the teaching simulator throughout three practice sessions. This study looks at the data from the simulator sessions as well as in-class observations for 12 chemistry GTA's teaching a general chemistry lab. A description of the frequency of "Stretch-It" questioning during the simulator training and the context in which how they implement it in the classroom will be presented. The implications of this project inform how simulator training can effectively improve GTA performance of targeted skills.

University of Central Florida

Perceptions of Illicit Drug Use and Perceived Drug Misuse Risks Among Individuals with Military Experience

Emilia Havlicek

Yen Han Lee

Illicit drug use and misuse present significant public health concerns with substantial societal and individual consequences, particularly among populations exposed to unique stressors. Individuals with military experience are especially vulnerable due to factors such as combat exposure, psychological trauma, and the challenges of reintegrating into civilian life, which may uniquely shape their perceptions of drug misuse and associated risks. This study investigates how military-specific factors, including combat experience, rank, and PTSD status, influence these perceptions, addressing a critical gap in the literature. Utilizing data from the National Survey on Drug Use and Health, this research applies advanced statistical analyses to explore patterns in beliefs about substance misuse within a representative sample of military-affiliated individuals. Preliminary expectations suggest that individuals with combat exposure or PTSD will demonstrate heightened perceptions of drug misuse risks compared to their counterparts. The findings aim to inform tailored prevention and intervention strategies, addressing the distinct needs of military personnel and veterans. This research not only enhances understanding within the military context but also provides a foundation for broader public health initiatives to improve mental health and reduce substance misuse in other high-risk populations.

University of Central Florida

We Don't Talk About Bruen: The Future of Second Amendment Jurisprudence

Emilia Shepard

Adrienne Lerner

After reviewing the Supreme Court's recent decisions regarding 2nd Amendment rights, what is expected in future 2nd Amendment cases? In 2022, the Supreme Court decided New York State Rifle & Pistol Association Inc. v. Bruen, establishing an entirely new standard for determining whether gun restrictions are constitutional. It also established an individual right to keep and bear arms publicly for self-defense. Since then, challenges have been brought to the court to test this new standard. United States v. Rahimi, one of the cases that pressed on the court's decision in Bruen. It was decided this June of 2024, revealing many flaws with the current standard and highlighting the impact creating a new legal standard can have on the legal system. The Bruen test has left courts across jurisdictions seeking clarification on Bruen's application amidst the influx of new challenges. Wilson v. Hawaii, one petition pending approval by the Supreme Court, exemplifies the confusion and disdain that many lower courts have in their efforts to apply or not to apply the Bruen test to 2nd Amendment challenges. Through a comprehensive analysis of case law and petitions to the court, I have discovered an emerging trend of 2nd Amendment challenges and inconclusive judgments regarding how the Bruen test should be applied. I suggest the court should clarify how their newly established standard should be applied, although I believe this is most likely to occur over an extended time since the court must choose the best cases for the docket.

University of North Florida

Evaluating Exercise Biomechanics Data Collection Methods for Deep Space Missions using Inertial Moment Units (IMUs)

Emiliana Del Rosario & Emma Drew

Dr. Stephanie Carey

In human spaceflight, maintaining astronaut physiological health is crucial. Muscle and bone atrophy are significant concerns, with up to 30% muscle strength loss in just one month of microgravity exposure. While exercise is vital, the limited space aboard spacecraft presents challenges for exercise monitoring and safety.

The current gold standard for biomechanics data collection employs infrared marker motion tracking systems, using 10 cameras and a Full Body Plug-in Gait marker set. While precise, these systems are bulky, stationary, and unsuitable for the confined environment of the International Space Station (ISS). Additionally, the Vibration Isolation System Exercise Platform (VIS) demands careful consideration of exercise form and stability.

The purpose of this study is to evaluate an alternative data collection method using Inertial Measurement Units (IMUs), specifically Movella Xsens DOT. It utilizes a setup of seven IMUs positioned on subjects' thighs (2), shanks (2), feet (2), and pelvis (1), or biceps (2), forearms (2), wrists (2), and torso (1) depending on the exercise. A total of five subjects were used to collect data on NASA's main mission regime exercises: barbell squat, bent-over rows, conventional deadlift, reverse chops, and overhead press. Kinematic data collected from IMUs was processed using the Open Sense

software to develop a biomechanical model, which was compared to the VICON infrared marker system. Preliminary results indicate that IMU-based data collection is comparable to the gold standard VICON in accuracy while offering advantages such as simplified setup, reduced crew readiness time, lower margin for error, and smaller physical footprint.

University of South Florida

Spatial Navigation Skills In Schizophrenia – A Meta-Analysis.

Emilie Vedder

Dr. Dorota Kossowska-Kuhn

Nearly 2.8 million of the 18+ population in the United States suffers from Schizophrenia. Schizophrenia is a complex neuropsychiatric disorder categorized by a variety of cognitive impairments, including deficits in spatial navigation. Spatial navigation is the ability to create or recreate a route. These deficits are shown to stem from disruptions in neural systems that formulate sensory, motor, and cognitive information. This meta-analysis investigates the differences in spatial navigation performance between cognitively healthy adults and adults with schizophrenia. The effect size will be measured using the standardized mean difference (Hedge's g). In addition to basic study characteristics (such as publication year, country, participant age, gender, and education level), we will also examine various moderators, including the format of test administration (real-world vs. virtual reality), the type of measure used (time vs. accuracy), and any additional spatial tasks associated with the main spatial navigation test. Initially, we imported 452 studies related to schizophrenia/spatial navigation into Covidence software. After the Title and Abstract screening, 144 studies were retained, 51 studies of that 144 were excluded during the Full Text review. A total of 58 studies are now ready for data extraction. The existing literature indicates a distinction between cognitively healthy adults and those with Schizophrenia in terms of spatial navigation performance. However, to draw definitive conclusions and address our research of this study, further quantitative evidence is needed.

Florida State University

The Relationship Between Daytona State College Student's GPA and Self-Esteem

Emily Borbidge & Jacquilyn Hudson

Jessica Kester

Prior research has studied the impacts that self-esteem has had on GPA, however, little research has been done concerning the relationship solely between GPA and self-esteem (Chen et al., 2023, Reitz, 2022, Hussein, 2024). The purpose of this study was to further investigate the relationship between GPA and self-esteem in Daytona State College students. Researchers conducted a survey of 103 Daytona State students and asked about their GPA and their self-esteem. The participants then responded to statements from a modified version of the Rosenberg Scale (Rosenberg, 1965, Chapter 2). Data indicated mixed results regarding students' GPA and self-esteem. However, when it comes to students feeling good about themselves, those in the higher GPA bracket reported feeling worse about themselves. The researchers also found that despite the GPA category, most students self-reported feeling positive about themselves. This might indicate a possible confounding factor known as self-efficacy, considering that the lower groups scored higher in self-esteem than one of the higher groups. Future researchers may test this by comparing the self-esteem of first year students to second year students as their self-efficacy is predicted to be higher and they may display better coping mechanisms (Belamghari, 2024, p. 8; Chen et al., 2023, p. 1,624; Orth & Robins, 2022, p. 12).

Daytona State College

Nontargeted Analysis of Per- and Polyfluoroalkyl Substances by Online Liquid Chromatography 21 Tesla FT-ICR Mass Spectrometry

Emily Hughes

Dr. Amy McKenna

Per- and polyfluoroalkyl substances (PFAS), known as "forever chemicals," are a polyfunctional, polydisperse, man-made, synthetic mixture of fluorinated organic compounds known for unique physicochemical properties (i.e., heat and water resistance) that have permeated consumer goods for the past fifty years. These proprietary mixtures contain fluorinated compounds that are more resistant to environmental degradation than other organic compounds due to the stability of the

carbon-fluorine bond, the strongest bond in organic chemistry. PFAS compounds are recalcitrant in the environment, enabling human exposures through multiple pathways, including drinking water, consumer goods, makeup, body washes, baby lotion, dental floss, toilet paper, and many others, and recent studies attribute PFAS exposure to a host of human and environmental health issues (e.g., cancer, autoimmune disorders, mental health issues, water impairment), raising concerns about their widespread impact. Of the approximately 1.7 million PFAS identified in patent literature, only ~430 PFAS compounds have been procured by the U.S. EPA to support the development of analytical methods with only ~42 currently commercially available, highlighting the massive knowledge gap in evaluating the long term impact of PFAS on human health. Nontargeted analysis enables identification of previously unknown PFAS species but requires resolving power and mass accuracy sufficient for identification of new PFAS. Here, we combine online liquid chromatography with a novel low-flow rate to increase speciation of PFAS compounds in aqueous-film forming foams (AFFFs) coupled to the 21 tesla Fourier transform ion cyclotron resonance mass spectrometry.

Florida State University

Cloud Condensation Nuclei Activity of Fresh and Oxidized Syringic Acid Aerosol Particles

Emily Nortmann

Dr. Denisia Popolan-Vaida

Organic aerosol particles (OAPs) of natural and anthropogenic sources, comprise 20-50% of global aerosol loading, impacting air quality, visibility, and climate forcing, with wildfires as known important contributors. The OAPs generated from wildfires can contribute to climate change by scattering or absorbing solar radiation, affecting the radiative balance of the planet and inducing cooling or warming effects, or acting as cloud condensation nuclei (CCN), which may impact cloud formation.

Phenolic acid aerosol particles are a class of compounds that are released in the atmosphere as a result of wildfires. Syringic acid (SA) aerosol particles, an example of a phenolic acid, have been detected in concentrations as high as 4.34 ng·m-3. Despite their abundance, little is known about their fate during atmospheric processing, or aging (i.e., reaction with atmospheric oxidants), and their impact on cloud formation. The reactivity of SA aerosols with ozone and their CCN activity before and after aging are investigated in a system composed of a flow tube reactor in conjunction with a scanning mobility particle sizer, a high-resolution mass-spectrometer, and a CCN counter. SA particles are observed to react with ozone and the changes in their chemical composition due to the reaction with ozone appear to increase their CCN activity. The results of this investigation add to a better understanding of the fate of aerosol particles released into the atmosphere and their potential impact on local and global climate, critical for the development of improved atmospheric models.

University of Central Florida

Democracy's Glass Ceiling: Female Candidates & Voter Support for Antidemocratic Behavior

Emma Barrett

Dr. Andrew Ballard

Recent scholarship has attempted to understand what enables the rise of antidemocratic candidates and makes these democratic backsliders so appealing to American voters. This thesis explores whether candidate gender may be one such factor. Drawing from literature on gender stereotyping and the success of female politicians in making far-right movements appear "mainstream," I predict that female candidates will lend legitimacy to antidemocratic policies by counteracting the masculine stereotypes associated with such policies. Using data from a pretest survey of 400 Americans, I conclude that the way that voters perceive antidemocratic behavior—even when that behavior is decoupled from political party or ideology—is inherently tied to masculine stereotypes. In a subsequent cross-sectional survey of 1,900 Americans, I find a statistically significant gender effect among Democratic candidates and their inparty supporters for certain antidemocratic policies: female politicians promoting judicial courtpacking and media censorship saw greater respondent support compared to otherwise identical male counterparts. My results challenge the relatively nascent body of literature on gender and antidemocratic policies, which asserts that a gender effect should only exist among far-right politicians and parties on account of the gender stereotypes associated with these ideologies. My findings contribute to a more comprehensive understanding of how American voters perceive democratic backsliding through a gendered lens and how political parties take advantage of candidate gender to navigate an increasingly polarized political landscape. However, further study of how the observed gender effect varies by antidemocratic norm and strength is still needed.

Florida State University

Longitudinal Effects of Low-Level Developmental Ethylbenzene Exposure on Zebrafish Survival and Reproduction

Emma Cavaneau

Dr. Tracie Baker

Ethylbenzene is a volatile organic compound (VOC) primarily used for producing synthetic polymers. Human exposure to ethylbenzene and other VOCs is causing concern as evidence linking VOC exposure to negative health outcomes is emerging. We aim to use zebrafish (Danio rerio) as a model organism to investigate survival and reproductive outcomes associated with low-level developmental exposure to ethylbenzene along with potential multigenerational effects. Zebrafish embryos were exposed to ethylbenzene at 0, 0,001, 0.01. 0.1, 1, and 10 ppm during the first 5 days post fertilization, and fish from each condition were raised to adulthood (F0 generation). We recorded long-term survival and began spawning these fish upon sexual maturity to measure fertility outcomes and multigenerational effects (F1 generation). Long-term survival was significantly decreased by ethylbenzene exposure during the first three months of life ($p=0.0067$), and there was a significant linear trend of decreasing survival across exposure concentrations ($p=0.021$). In a preliminary analysis, there were no significant differences between the control and exposure groups in any of our fertility and fecundity metrics. There were significant behavioral differences for some groups of the F1 larvae in both light and dark cycles ($p<0.05$). Following the first three months of life, where we observed altered survival, we continue to evaluate significant long-term effects on the adult exposed F0 fish. Continued analysis of the F1 generation will be useful for investigating any additional multigenerational effects. These findings could provide more insight into ethylbenzene toxicity and the adult-onset and multigenerational effects of VOC exposure for public health.

University of Florida

Examining the Effects of Water and Sea Level Rise on Archaeological Gar Scales Through the Application of Diverse pH Solutions

Emma Ditzig & Destiny Perez

Dr. Alanna Lecher

This archeological study investigates the impact of water immersion on pristine and degraded gar scales, a type of archaeological artifact, to assess their susceptibility to physical and chemical deterioration. The study hypothesized that pristine scales would retain less water than degraded scales. Thirty-two pristine and thirty two degraded scales were collected from an archaeological site and weighed before and after soaking in water for two weeks. Results indicate that while both pristine and degraded scales exhibited minimal weight gain when wet, degraded scales experienced a significantly higher percentage increase in weight compared to pristine scales. This suggests that degraded scales are more prone to water absorption and potential chemical degradation. Further analysis of soaking in pH buffers revealed that degraded scales are more susceptible to remineralization at pH 8, but particularly at pH 7. However, exposure to a pH 6 buffer had no significant effect, indicating a higher risk of chemical degradation at a lower pH. Future research will focus on the dissolution rates of pristine and degraded scales in acidic solutions to better understand their long-term stability in waterlogged environments.

Lynn University

The Path to Authentic Relationships: Understanding the Impact of Adverse Childhood Experiences and Emotion Regulation

Emma Heidelberg

Dr. Lindsey Rodriguez

This poster presentation explores how difficulties in emotion regulation (DERS) mediate the relationship between adverse childhood experiences (ACEs) and authenticity in relationships. It was hypothesized that adverse childhood experiences would be related to increased difficulty in emotion regulation, which would then be related to decreased authenticity in relationships. The sample included 542 participants who completed a survey at the University of Florida in exchange for course credit. Preliminary review of the data reveals significant positive correlations between adverse childhood experiences, difficulties in emotion regulation subscales, and authenticity in relationships. Outcomes may indicate the importance of the role emotion regulation plays in developing authentic relationships after exposure to adverse childhood experiences, which may in turn highlight the need for increased emotion regulation skills and self-awareness to foster healthy, authentic relationships.

University of Florida

Bounded Transient Time Leader Emissions tracking

Emma Lambert & Ainsley Helgerson

Jeremy Riousset

Lightning as a phenomenon is still not fully understood, with the mechanism behind Narrow Bipolar Events (NBP's) an open research question (Dwyer, Uman 2014). This project seeks to use verification of this mechanism as a stepping stone to propose a method for predicting lightning strikes that can be tailored to the differing NBP mechanisms to facilitate further study. Utilizing Hamilton's principle, we proceed under the assumption that Galactic Cosmic Rays (GCR's) are the mechanism by which NBP's form (Neto, Pinto I., and Pinto O., 2013). Under this assumption, we may use muon detectors magnetically shielded to restrict their field of view to only the relevant portions of sky. The site will have an instrument capable of detecting relevant information about atmospheric conductivity (based on the electrification methods in (Zeigler and Ray, 1986)), likely RADAR. The return data will be characterized via cascading band-pass filters for speed and the data will be assigned a conductivity score for a certain chunk of the atmosphere (hereafter referred to as a 'voxel') This data is propagated in the simulation computer in accordance with the wind field, and the detected NBP's will be used as a start point for a branching voxel path integral, with the minimum conductivity score path being the most likely path along which the leader emission should travel.

Embry-Riddle Aeronautical University

Characterization of New Molecular Tools to Detect Branched Ubiquitin Chains

Emma Werner, Isabella Holt, Hannah Maloney & Michael E. French

Dr. Michael E. French

Ubiquitin chains are key regulatory signals that control the stability, activity, and location of proteins in various ways. Recent studies have shown that ubiquitin chains can be branched and that branched chains regulate proteins through diverse mechanisms. Despite mounting evidence that branched chains have important biological functions, our understanding of these signals has been limited by a lack of accessible methods to detect them. In this study, we explored the effectiveness of two newly developed tools designed to detect branched K48/K63 chains. An engineered nanobody reported to bind branched K48/K63 chains with high affinity and specificity (Lange et al., 2024) was purified from E. coli and assayed for binding to ubiquitinated proteins containing branch points. Under the conditions tested, the nanobody did not show specificity for branched K48/K63 chains in complex mixtures of ubiquitinated proteins. We also tested the deubiquitinase, MINDY1, which has been reported to preferentially cleave K48 linkages within K48/K63 branch points, in addition to the K48 and K63-specific deubiquitinases, OTUB1* and AMSH*, for their ability to cleave branched K48/K63 chains attached to substrates. As expected based on the topology of the chains, MINDY1 and OTUB1* effectively removed distal K48 linkages from K48/K63 branch points, whereas AMSH* cleaved K63 linkages proximal to the branch points. We conclude that the nanobody may not be an effective tool for detecting branched K48/K63 chains in complex mixtures of ubiquitinated proteins. However, MINDY1 and other deubiquitinases that have recently been shown to specifically target branch points hold promise as new diagnostic tools to detect

University of Tampa

Indicator's of Partisanship in the United States

Eric A. Bonilla & Dr. Ransford Edwards

This study explores the relationship between income and partisanship in the United States, discussing frameworks such as economic self-interest, social identity theory, and the myth of the meritocracy. Americans with a high income tend to align their interest with the Republican Party due to fiscal policy that favors free market principles. By contrast, Americans who report lower income predominantly identify as Democrats. Voters in the low to lower-middle class are driven by the party's advocacy of social welfare and progressive economic policy. Education is a driving factor that impacts party alignment. College-educated voters tend to favor Democrats, regardless of level of income. Social identity theory highlights how race and social categorization heavily impact partisanship. The results suggest that race is the critical determinant of party alignment in the United States; people of color majorly support the Democrat Party, while White Americans largely favor the GOP.

Nova Southeastern University

Bullying Victimization in College: Review of Associations with Psychological and Academic Outcomes

Eric Clayton

Dr. Tiina Ojanen

Bullying victimization, where perpetrators intentionally target individuals with less power, has been well-studied in schools, showing negative effects on academic and social development (Olweus, 1993; Nikolaou, 2017; Idsøe et al., 2012). Like youth, bullied college students also suffer from lower psychological and academic well-being; victims report, among other things, suicidal ideation and decreased class performance (Sinkkonen et al., 2014; Faucher et al., 2014). Victims may also experience sadness, anger, and decreased self-confidence, which hinder social interactions and increase vulnerability to further bullying. Furthermore, some students express a desire to retaliate, with moral disengagement as the key mediator—victims' morals erode, allowing them to justify aggression (Dong, 2020). However, despite the detrimental effects of bullying victimization on college students, existing literature reviews have typically focused only on either academic or psychological effects in isolation (see Faucher et al., 2014; Beran et al., 2012). The current study conducts a systematic review of bullying victimization in relation to both psychological and academic well-being during college, utilizing primarily the PsycInfo and Sociological Abstracts (H.W. Wilson) databases to identify relevant articles. The review aims to summarize critical information and highlight implications for policy and practice in higher education. For review breadth and quality, both in-person and online forms of victimization are covered. Bullying victimization's impact on student success and well-being highlights the urgent need for research and interventions focused on victim support and prevention to mitigate bullying in higher education (Vaill et al., 2020).

University of South Florida

Does Receiving a Personalized Noncognitive Skills Profile Influence First-Generation Students' Achievement Compared to First-Generation Students Without a Received Profile?

Erika Shayne P. Tarongoy

Dr. Starlette Sinclair

Navigating brand new obstacles and opportunities around one's late teens and early twenties, a period also called 'Emerging Adulthood', can often be perplexing (Arnett, 2000). These socio-emotional changes in students' personal lives along with transitional changes involved in the college academic sphere have led to greater perceived stress and poor adjustment outcomes (Zhao et al., 2023). Past research analyzed noncognitive abilities, student background variables (gender, ethnicity, first-generation status, and socioeconomic status), and test scores to uncover the leading predictor for academic success (Parker et al., 2005). Similarly, my research question explores whether metacognitive awareness in a First-Generation student sample through a Noncognitive Skills Profile (NSP) affects their academic success in comparison to First-Generation students who did not receive the profile. To create the profile, a large sample of FTIC (First-time-in-college) students took a self-reported Qualtrics survey collecting data related to students' background and noncognitive skills. This study's profile focused on output based on nine variables: Big Five Factors, Grit, Academic Burnout Level, Resilience skills, Procrastination levels, Growth vs. Fixed Mindset, as well as Academic, Emotional and Social Self-Efficacy combined in an individualized document titled 'Star's Noncognitive Skills Profile'. The profile gives personalized feedback based on students' results that also direct them to campus resources that correspond with their weaknesses. Students' abilities will be tested against retention rates, attempted and completed credit hours, Dean's and President's list accomplishments, and GPA comparison relative to their peers. I hypothesize that the Noncognitive Skills Profiles indeed influence academic success in First-Generation Students.

Florida Gulf Coast University

Understanding Barriers to Sustainable Behaviors: A Mixed-Methods Study at Brevard Zoo

Erin Stolen

Brian Ogle

Despite the potential of zoos to act as motivating agents for positive environmental changes in visitors, psychological barriers appear to have a limiting effect on potential behavior shifts. If barriers to sustainability can be identified by zoos or similar institutions, changes to their messaging can ensure that visitors' concerns and questions about sustainable actions can be addressed during zoo visits. Previous research has proven the existence of an attitude-behavior gap; one explanation for this gap is psychological barriers known as Dragons of Inaction. Barriers to sustainable actions fall into five categories: Change Unnecessary, Conflicting Goals and Aspirations, Interpersonal Relations,

Lacking Knowledge, and Tokenism. This study used a mixed-method approach to determine which barriers are most influential in reducing behavior changes in Brevard Zoo members. The study focused on three sustainable actions promoted by Brevard Zoo: planting native plants, using bird-friendly coffee, and composting. A survey was taken by 229 zoo members to determine if members were motivated to perform the specific sustainable behaviors promoted by the zoo and what barriers members considered most relevant. Twelve individual interviews were then performed to further assess possible barriers to action using qualitative analysis. This study's findings indicated that Brevard Zoo members often did not perform sustainable behaviors, despite feeling motivated to, and that the most significant barrier to sustainable actions is a perceived lack of knowledge. Both survey respondents and interview participants indicated desires to protect the environment despite these beliefs being inconsistent with the frequency of sustainable actions being reportedly performed.

University of Florida

Investigating the Dimerization DNAJB1 Protein

Erina Kotreli & Trang Le

Szymon Ciesielski

Molecular Chaperones play an important role in the maintenance of cellular proteins by carrying out functions ranging from folding newly synthesized proteins to refolding stress induced aggregated proteins. An accumulation of aggregated proteins is linked to human disease like Alzheimer's disease (AD), this is one of the main leading causes of death in the United States and it results in severe symptoms such as memory loss and brain disfunction. A hallmark of this disease is the abundance of structurally abnormal proteins, which are thought to be a factor of neuronal cell death. These proteins aggregate in an organized matter forming fibrils which can be defragmented only by activity of molecular chaperone DNAJB1. DNAJB1 is an obligatory partner of HSP70, and it is composed of different domains including the dimerization domain (DD). My research is focusing on how the dimer is formed and its function. To explore the DD, I first investigated the available structure information to identify molecular interactions allowing for the homodimer formation. Our next goal is to introduce asymmetry into the structure to be able to control the dimerization process. This research aims to dissect the DD as well as test the biological relevance of the dimerization process. We hope that this effort will provide new insights into how DNAJB1 enables the propagation of Alzheimer's disease.

University of North Florida

ASCL: The American Sign Computer Language Recognizer for Understanding ASL

Ertis Seferi

Dr. Corey Pittman

Learning American Sign Language is difficult, especially when you need expert guidance. While some signs are easy to memorize, the most common issue beginners face is remembering the meaning of those signs. We address this problem by presenting the American Sign Computer Language Recognizer (ASCL). ASCL functions like an interactive dictionary where users can practice signing on and receive immediate feedback on correctness. The application uses state-of-the-art computer vision and traditional machine learning techniques to capture hand and finger movements in 3D and match them against a list of templates in the form of individual signs. We designed ASCL for both accessibility and ease of use. Thus, ASCL provides beginners an alternative and fun way to learn independently while also being usable to intermediate learners to reinforce foundational concepts. This project combines computer science, linguistics, and education to show how technology can make learning inclusive and interactive. Moving forward, our goal is to expand ASCL's gesture library to support more advanced signing, such as fluid conversations; we also aim to gather feedback from sign language students and educators to enhance ASCL's functionality.

University of North Florida

Discovering SoulClap: An Intergenerational Auto-Ethnographic Discussion on Black Joy, Health, and Wellness

Eryn Files & Gemini Williamson

Dr. Chris Michelle Omni

Black Joy, pioneered by the Outreach, Mentorship, and Narrative Inquiry (OMNI) Institute under Dr. Chris and Professor Vincent Omni, examines the intersection between Black people's emotional well-being and national public health standards. The OMNI Institute prioritizes Black Joy as a non-medical factor of public health, countering trauma-based narratives typically associated with the community. This research project extends our investigation into Black women's health through our work on the OMNI Institute's latest project, "SoulClap: A Black Joy Journal." In efforts dedicated

to the release of the inaugural edition's theme of Black Joy and Nature, we participated in the interviews of two Black women from Bristol, UK with Dr. Omni and intergenerational researcher Michelle Gunn in three segments, themed "Joy," "Nature and Spirituality," and "Growth, Lessons, and Self-Care." We identified common themes within the interviewees' experiences through embodied knowing and endarkened narrative inquiry, integrating intuition and sensory awareness into the traditional analytical research process. We investigated the broad influence of these themes on Black women's sense of identity and collective wellness through literature reviews, identifying key theories like Alice Walker's and Dr. Melanie Harris' eco-womanism. As a team, we followed Dr. Omni's Kujima Theory of Collective Self-Motivation, featuring kujichagulia (self-determination), kuumba (creativity), and ujima (collective work and responsibility). Considering our connection to the research as young Black women, we ultimately challenge the modern characterization of the Black woman and argue for the normalization of self-care, rest, religion, and sources of wellness found to intersect with Black women's experiences in nature.

Florida State University

Eye on the Target: Robotic Emulation of Mammalian Gaze Fixation Using Computer Vision

Essence Wallace

Xiaohe Wu

When an object caught the attention of an mammal, the mammal will fix its gaze on that object. This might involves turning the head and rotate the eyeballs. The same behavior is also desirable in numerous robotic applications. With the advances in computer vision and micro-controller technologies, it is possible to empower a robotic project with this kind of object tracking capability. You Only Look Once (YOLO) is a popular neural network-based real-time object recognition algorithm used for identifying objects in video streams. However, YOLO was originally developed to work in environments where computing power is not a matter of concern. The objective of this study is to explore the possibilities of implementing the original YOLO or its variants in an embedded setting where computer power and resources are limited. Potential adjustments to the YOLO algorithm will be proposed and the effects studied. Appropriated embedded computer hardware will be tested. Studies will also be conducted to address issues related to actuators and motion control algorithms. The result of this research will facilitate the application of YOLO in robotic tasks where good computer vision is required.

Bethune-Cookman University

Evaluate Foundation Model Performance for Dental Radiograph Segmentation

Eswanth Sriram Chengalasetty & Laura Brattain

Dr. Laura Brattain

Dental radiography interpretation is time consuming and suffers from high variability when done manually by medical personnel with limited training. AI-assisted segmentation has the potential to play a critical role by enabling the precise identification of key dental structures. This project investigates the potential of two cutting-edge AI models—the general-purpose Segment Anything Model (SAM) and its specialized counterpart, MedSAM—in accurately segmenting dental radiographs and 3D intraoral scans. The study evaluates their ability to delineate essential dental landmarks, such as cusps and mesial-distal points, using a diverse dataset of 116 intraoral scans with manually created ground truth masks representative of real-world dental cases.

Our methodology involves comparing segmentation accuracy, efficiency, and adaptability to determine each model's strengths and limitations. While SAM offers flexibility for broader applications, MedSAM is designed with domain-specific features that may provide an edge in medical imaging tasks. Preliminary results show that SAM demonstrates promising performance, achieving good initial segmentation accuracy, it requires further refinement and training to consistently identify key dental landmarks precisely. By examining these models side by side, this research aims to inform the development of more accurate and efficient AI tools tailored to the needs of dental healthcare professionals.

This work underscores the transformative potential of AI in dentistry, paving the way for advancements in automated treatment planning and diagnostics while reducing the cost. It also highlights the importance of balancing generalization and specialization in AI model development. The findings are expected to guide future innovations in dental AI and ultimately improve clinical outcomes.

University of Central Florida

"Help me, help you, help me" Work From Home: Graduating Seniors' Attitudes on the Pros and Cons of Working Remotely Following Graduation

Eternity Bradshaw

Dr. William Berry

The first high school Seniors affected by the Covid-19 pandemic officially graduated from college during the 2023-2024 academic year and as the next set of students affected by the Covid-19 pandemic aftermath are beginning to enter the workforce, questions about the longevity and sustainability of remote work are growing. The goal of this study was to analyze the path upcoming graduates will take when entering the workforce, in-person or remote jobs, and whether their experience with learning remotely has contributed to their decision. In review of previously conducted studies, findings suggested that having a balance of remote and on-site work has led to high rates of job satisfaction but with fully remote jobs on the rise, studies are showing a lack of accountability. This study utilized survey methodology to analyze which work format graduating seniors prefer as well as their thoughts on the quality of work that would be produced. The results showed preference for remote work on the basis of more job opportunities for adults who recently graduated with their Bachelors degree as well as job flexibility. The results about the quality of work expected were on the low side with students suggesting that working fully remote does not motivate them to exceed workplace expectations. These findings suggest that more structure is needed to be able to sustain this new concept of majority remote positions and that the idea of eliminating in-person positions fully would not be helpful to today's economic system.

Bethune-Cookman University

Genomic Epidemiology of Staphylococcus aureus Sequence-type 97

Eva Armao & Sachitaa Senthilkumar

Taj Azarian

Staphylococcus aureus (S. aureus) is a gram-positive bacterial pathogen that colonizes human nasal passages, mucous membranes, or the skin of carriers, with colonization commonly found in 20-30% of healthy people. S. aureus has the potential for two types of infection within human hosts: methicillin-susceptible (MSSA) and methicillin-resistant (MRSA). These infections can be further classified based on their method of infection and are known as community-associated (CA) and healthcare-associated (HA). Upon further population investigations, specific sequence types (ST) of S. aureus have emerged globally, showing increased virulence among populations. Each ST may reveal the evolutionary background of a particular lineage of S. aureus and how it has colonized a specific population group. ST97 has established a following of particular interest, as it has had widespread areas of population infection. Current sequencing data has shown isolates in the United States, Japan, and Brazil. The genomic epidemiology of S. aureus ST97 highlights its significant role as a zoonotic pathogen, as livestock-associated (LA) infections are prevalent. This study seeks to emphasize the evolutionary history and global distribution of ST97, characterized by its adaptation to various hosts and environments. The emergence of new strains underlines the urgency of monitoring ST97 transmission pathways and antimicrobial resistance mechanisms. Currently, we are utilizing genomic tools for phylogenetic analyses, which will aim to explain the virulence and spread of ST97. Ultimately, understanding these dynamics will be critical for developing targeted interventions to mitigate the impact of ST97 on vulnerable populations.

University of Central Florida

Convenience Robotic Arm for Power Wheelchair Users

Faith El massari & Daniela Zamora Alviarez

Redwan Alqasemi

Individuals with motor impairments often experience difficulty accessing buildings and elevators, relying on others to press buttons or scan cards. This project's aim is to develop a robotic arm accessory that can be easily attached to most power wheelchairs, providing users greater independence in these situations. Furthermore, affordability, simplicity and convenience are prioritized, with strategic selection of hardware and software components, as well as design choices. The major components of the project are a 4 degree of freedom robotic arm, its four interchangeable end-effectors, a joystick module for interface with the user, and a mounting mechanism for the module. The research was carried out through a structured process that included design and development, prototyping and fabrication, testing, collaboration and feedback to ensure functionality and a user-centered design. Findings address key optimization parameters, such as cost efficiency, modularity, and ease of integration to facilitate effective implementation into industrial applications. By addressing a critical gap in assistive technology, this research

contributes to advancing accessibility and autonomy for individuals with disabilities, aligning with broader goals of universal design and has the potential to influence policies promoting inclusive environments.

University of South Florida

The Effects of Music and Visual Arts Training on Response Inhibition in Children (8-12 years)

Faith N. Nwosu & Medha M. Patel

Jennifer A. Bugos

Music education is monumental in early child development; improvements in cognitive flexibility and inhibitory control have been noted amongst preschool children who underwent music training (Rodriguez-Gomez & Talero-Gutiérrez, 2022). Both cognitive flexibility and inhibitory control are components of executive function (or EF), which are a collection of cognitive abilities, such as inhibition and working memory, that contribute to a child's academic and behavioral development (Diamond, 2014; Blair, 2016). Inhibitory control (also known as response inhibition) has been studied in conjunction with music training for several years (Jamey et al., 2024), and results have demonstrated a positive correlation between the two concepts. Sixty-one children 8-12 years (21 male, 40 female) were randomly assigned to a nine-day intense music or visual arts camp or were assigned to a waitlist control group. Prior to and after the music or art camp program, a Go/NoGo task was administered to all participants. 200 trials were conducted in total (160 Go, 40 NoGo), and presented at random with a 4:1 ratio. An independent sample t-test was used to analyze the data from time 1. The average reaction time for participants randomized to the music group was the fastest at 4394.493 milliseconds, compared to 4472.766 milliseconds for the art group, and 4626.710 milliseconds for the control group. These results further coincide with findings from the literature (such as Gozales, Robertson, and Gibb, 2020).

University of South Florida

Characterizing the sleep-wake-related dynamics of protein kinase A

Fapianey Alexandre

Dr. Yao Chen

Sleep is a fundamental biological process with diverse functions, including but not limited to bolstering immunity, regulating metabolism, and supporting cognition. Sleep is comprised of three states: Rapid Eye Movement (REM), Non-Rapid Eye Movement (NREM), and wakefulness. These states are defined by distinct neurochemical and electrical signatures. However, the underlying mechanisms by which these signatures confer sleep's various effects on the body is unknown. Notably, protein kinase A (PKA) is an enzyme that integrates input from neurochemical and electrical extracellular signals. Previous experiments have shown that PKA activity is predictable as a function of sleep-wake states in hippocampal excitatory cells. Thus, understanding whether sleep-wake associated PKA dynamics are conserved or vary across the brain can provide insight into how PKA could play a role in the diverse functions of sleep. This study investigates PKA dynamics in the motor cortex (M1), visual cortex (V1), and both excitatory and inhibitory hippocampal cells (CA1) across sleep states. We monitored sleep-wake states using EEG and EMG. Simultaneously, PKA activity was measured using a fluorescent sensor of PKA and Fluorescence Lifetime Photometry (FLiP). Our current findings indicate synchronous PKA dynamics across diverse brain regions, suggesting that there is some coordinated mechanism of regulation governing the protein's activity with respect to sleep-wake states.

University of Florida

A Systematic Review of Rapid Urbanization and Coronary Artery Disease in Sub-Saharan Africa.

Faris Hassan & Ethan Joseph

Olukemi Akintewe

Coronary Artery Disease (CAD) is the most prevalent form of cardiovascular disease (CVD) globally, accounting for over half of CVD related deaths. Rapid urbanization (RU) of sub-Saharan Africa (SSA) has been associated with risk factors for CAD. Some include hypertension, diabetes, obesity and oral microbiome alterations. RU can cause cultural changes in diet, leading to change in the quality and quantity of macro and micronutrients consumed. This study investigates RU's impact on diet and the prevalence of CAD. Studies discussing CAD risk factors in SSA were systematically reviewed using literature from PubMed following PRISMA protocol. 226 articles were scanned and 26 were included in the analysis. This review identifies the correlation between Western diet and its impact on CAD risk. The Western diet a higher volume of processed food, leading to a higher intake of sugar and fat, and less in fiber. These changes adversely affect the microbiota, leading

to increased CAD risk. Community education and regulation on the production of processed goods were identified to be potential interventions. Taxes on processed goods and healthy food quotas for big businesses can encourage consumers to make healthier choices, leading to a potential decline in risk factor prevalence for CAD.

University of South Florida

Evaluation of Multiple Choice Questions from Publishers used in Introduction to Forensic Science using Item Writing Flaws Evaluation Instrument

Fatima Khogali

Tamra Legron-Rodriguez

Multiple choice questions (MCQs), while being a common method to evaluate students' knowledge of the content being taught, can also serve as a disadvantage to both the student and the instructor if they contain flaws. A previous study has shown that assessments with flawed MCQs led to about 10-15% of students being falsely categorized as failing despite having done well on the exams with no item-writing flaws (Downing, 2005). The Item Writing Flaws Evaluation Instrument (IWFEI) is a tool designed to limit writing flaws in MCQs, and we utilized this tool to classify items from a published text for Introduction to Forensic Science courses (Randall, 2019). 337 items were collected from 10 chapters of a relevant published work and each item was evaluated by 10 criteria outlined by the IWFEI. Each criterion was categorized as "Yes", if they met the criterion, a "No" if they violated the criterion, or "Not applicable." The data collected was compiled and measured through content analysis, revealing that the most flawed criterion from the data set included MCQs with incomplete stems. With previous studies highlighting the importance of structuring MCQs and creating instruments to limit item-writing flaws, this study serves to expand them by analyzing publisher content in Introduction to Forensic Science for item-writing flaws and drawing attention to notable errors made. Future research can include the effects of item-writing flaws on students' grades in these courses, allowing forensic educators to understand and improve flaws in MCQ design.

University of Central Florida

Exploring Hearing Health Beliefs in Hispanic/Latine Populations Suing the Hearing Beliefs Questionnaire

Fiorella Wu

Dr. Naudy Ocasio Portalatín

Hearing loss (HL) is a widespread chronic condition in the United States, impacting 37.9 million adults (11.6%) aged 35 and older. Hispanic/Latine individuals, who make up 19% of the U.S. population and are projected to increase to 29% by 2050, experience a higher prevalence of hearing loss (15%) compared to the national average. However, research focused on hearing healthcare within this growing population remains scarce. The Health Belief Model (HBM) has been applied to hearing health behaviors, demonstrating its effectiveness in predicting hearing aid uptake and outcomes. The Hearing Beliefs Questionnaire (HBQ) was developed to assess HBM constructs in relation to hearing health, showing significant associations with hearing health behaviors. Studies have found that HBM constructs, particularly cues to action and perceived burden on communication partners, are significant predictors of pursuing hearing evaluation. Research suggests that tailoring interventions based on an individual's stage of change and HBM constructs may improve hearing help-seeking behavior (Gilliver et al., 2015). The HBQ had been translated and has yet to be validated with this population. Data analysis includes descriptive statistics to evaluate score distributions and patterns across demographic groups. Group comparisons and correlations will examine associations between HBQ scores, hearing loss severity, and related variables. These findings will support culturally tailored interventions to improve hearing help-seeking behaviors in this underserved population.

University of South Florida

Characterizing Biofilm Formation Potential of Klebsiella pneumoniae MRSN Isolate Strain 564304

Flor Santiago

Dr. Renee Fleeman

Klebsiella pneumoniae is classified as a top-priority pathogen by the CDC and WHO as a global health threat due to high mortality rates, limited treatment options, prolonged hospital stays, and the urgent need for novel therapies. Biofilm-associated

infections are implicated in many clinical cases, especially urinary tract infections. We found that K. pneumoniae strain MRSN 564304, a MDR clinical isolate from a urine sample, displayed a growth rate defect although it formed a robust biofilm that resists shear flow. The primary aim was to investigate the role of oxygen and biofilm formation in the previously observed growth defect and identify environmental cues mediating biofilm formation in this isolate. To accomplish this goal, we enumerated planktonic and biofilm cell populations when grown in increasingly oxygenated conditions and assessed biofilm formation in various media conditions using two independent measures. We found less biofilm formation in LB HS than in TSB and the addition of glucose to media resulted in decreased biofilm formation. We found magnesium helped promote biofilm formation in the presence of glycerol. Bile Salts in the presence of glucose further impacts the ability of MRSN 564304 to form a biofilm and the addition of magnesium could not rescue this effect. Our confocal z-stack images in glucose conditions reveal changes to the polysaccharide and protein composition of the biofilm matrix. Our results suggest that glucose decreases the biofilm formation of MRSN 564304. Future work will be to identify the genetic components leading to the unique ability to form a robust biofilm.

University of Central Florida

The First Three Decades of GIS Development

Flora Domitrovic

Dr. Paul Renfro

Contemporary geographic information systems (GIS), which encompass computerized resources from digital maps to geospatial data, are essential to Americans' daily lives and, among others, the infrastructure, agriculture, and environmental protection sectors. This project is a history of GIS development from the late 1960s into the 1990s. Specifically, the project aims to identify the driving forces behind GIS technology development and identify what new capabilities in the American urban planning, environmental conservation, and military sectors such developments made possible. To do this, the project examines existing academic work, anecdotal GIS histories and 1990s sociological critiques, and U.S. federal agency and congressional documents, conference proceedings, and maps themselves from the study period. My preliminary findings are that the environmental movement and its associated regulations during the 1960s and 1970s, especially the National Environmental Policy Act of 1969, were a driving force of GIS development and adoption in federal agencies. Research into the historical motivations and subsequent applications of GIS development is important because any work on GIS history currently consists of technically focused retrospectives written by a few pioneers of GIS; work on this subject has not yet been published in a History or History of Science journal. The story of GIS has been an overlooked chapter in our understanding of the computer and data science revolution which has inextricably changed and will continue to change both our daily lives and the world.

Florida State University

Optimizing End-Capping Strategies for Enhanced Self-Healing in PDMS Polymers

Forrest Dohner

Dr. Jenny Vu

As advancements in material science continue, intrinsic self-healing polymers have gained significant attention for their ability to autonomously repair damage without external intervention. This research focuses on developing a polyurea polydimethylsiloxane (PDMS)-based polymer capable of intrinsic self-healing via reversible hydrogen bonding mechanism. Herein, are the results of the modification of the end-cap on the polymer chain. This end-cap functionality can influence key material properties, including elasticity, durability, and healing capability, by affecting the interactions between the polymer chains. The goal of this study is to find the optimal functionality for the end-capping moiety to enhance the mechanical properties of the material while improving self-healing efficiency. Methanol, used as an end-cap in preliminary trials, has yielded superior results relative to the use of water as an end-cap; small punctures and cuts are healed within 48 hours. Healing efficiency was measured by both optical microscopy and tensile testing. Applications of this self-healing polymer include providing a protective coating for unmanned aerial vehicles (UAVs), enhancing their resilience to wear and damage in demanding environments. By systematically evaluating different end-capping molecules, this study aims to create a versatile material that advances both polymer science and aerospace applications.

Embry-Riddle Aeronautical University

Detecting Hardware Trojans Using Side-Channel Power Analysis

Franco Mezzarapa & Joshua Joseph

Dr. Mike Borowczak

This work presents a manufactured device that contains two sets of isolated hardware: one containing an encryption scheme and the other containing identical encryption logic alongside several hardware trojans. The objective is to expand upon prior research in hardware trojan detection by applying side-channel power analysis on a physical device during encryption operations. Utilizing similar Automated Machine Learning techniques, this work aims to validate prior simulation results in a hardware medium and detect the presence of key corruption alongside information leakage through power capture anomalies.

University of Central Florida

Compound Cavity Formation and Splash Crown Suppression by Water Entry Through Proximally Adjacent Polystyrene Beads

Freddy Zeas & Sebastian Anzola

Daren Watson

We move forward the important topic of water entry by documenting splash dynamics arising from the impact of hydrophilic spheres with buoyant millimetric microplastics, mimicked in our study by polystyrene beads. Collision with small, buoyant beads is yet another means to manipulate splash dynamics. In this experimental study, we investigate the fluid-structure interactions between beads and hydrophilic spheres for Froude numbers in the range of 20 - 100. The presence of proximally adjacent beads atop the fluid with respect to impacting spheres promote flow separation and compound cavities for sufficiently large Froude numbers, while suppressing the growth of splash crowns. Compound cavities consist of a shallow, quasi-static first cavity that seals near the water line, and a second, deeper cavity produced in the wake of descending spheres. Our study unravels the physics behind the widely encountered interaction of solid projectiles impacting passively floating particles and our results translate to the entry dynamics of water-diving creatures and projectiles into water bodies polluted by floating millimetric microplastics.

Florida Polytechnic University

Identification of Key Cytosolic Molecular Chaperones in Tardigrades

Gabriela Serra

Szymon Ciesielski

Tardigrades are eukaryotic organisms that can survive extreme conditions and environments such as ion radiation, dehydration, and even space. A recent discovery suggested that these animals are able to withstand these conditions due to cytoplasmic abundant heat soluble (CAHS) proteins. These proteins can form a protective gel inside their cells as a response to external stress conditions. Another way cells respond to stress conditions is via formation of so-called stress granules as a result of a controlled protein aggregation. This prevents uncontrolled stress-induced protein aggregation that can be detrimental to the cell. Formation and disaggregation of stress granules employees' molecular chaperones, a subset of cellular proteins essential for quality control of cellular proteome. We speculate that similarly to stress granule formation and disassembly, gel formation by CAHS proteins could be a chaperone-mediated process. This project is focused on identifying central cytosolic chaperones from the JDP and Hsp70 families in Tardigrades and investigating their role in the resistance of these organisms to extreme environmental conditions. Analysis of these novel proteins will not only help to better understand Tardigrades but also increase our understanding of the general role of molecular chaperones in cellular biology.

University of North Florida

Parental Involvement in the development of Social Anxiety Disorder in Children and Adolescents

Gabriella Boykin

Dr. Akintewe

Social Anxiety Disorder (SAD) is one of many anxiety disorders that are common in adults and in children, affecting over 30% of youth aged 6 to 14. Often gone unnoticed and untreated, this condition can significantly disrupt children's social and academic lives, and may even persist into adulthood. The causes of this specific anxiety disorder is still in question for psychologists. Understanding these factors is critical for developing targeted interventions to prevent long-term consequences of SAD. This systematic

review synthesizes existing literature to examine the interplay between specific parental behaviors and genetic predispositions that contribute to the onset and persistence of SAD. Articles were systematically extracted using Endnote and Ryyan from databases such as PubMed, ScienceDirect, and Springer.

Key findings indicate that both maternal and paternal parenting styles significantly affect children's anxiety levels, with maternal overprotection and criticism linked to increased anxiety symptoms, while fathers' anxiety-related cognitions uniquely predict child anxiety.

Genetic factors, including behavioral inhibition and family history of anxiety disorders, further compound the risk of developing SAD. Additionally, the review highlights cross-cultural differences in parental impact on anxiety, revealing that cultural context significantly influences perceptions of parenting behaviors. Other contributing factors include socioeconomic status and parental mental health. Despite the robust findings, limitations exist regarding the underrepresentation of paternal influence and the nuanced understanding of genetic versus environmental effects. This review underscores the critical role of parental engagement in shaping children's social anxiety and advocates for targeted interventions, to improve treatment outcomes.

University of South Florida

Pilot Study: Undergraduate Student Perceptions of Research Groups as a Community of Practice

Gabriella Khazal

Dr. Brian Lane

The communities of practice (COP) framework describes learning as a process of navigating one's position of membership within a community of professionals pursuing a set of common goals using established practices. As students navigate their membership within a community like a research group, they develop a mental model of the community of practice and use this model to guide their future career decisions. Drawing has been shown to illustrate students' perspectives and experiences, offering important benefits as a source of qualitative information. In this pilot study of ≈23 UNF undergraduates, we demonstrate how a drawing survey can be used to identify elements of a student's COP model in the context of a research group. We present sample drawing responses to the survey and a quantitative analysis of the elements that these students included in their drawings. By disaggregating by academic major (biology and physics), we identify possible patterns and differences in responses between these groups.

University of North Florida

Adaptation of an Invasive Tree Frog (Ostepilus septentrionalis) in Response to Hurricane Milton

Gabriella Moraglia

Jacob LaFond

In evolutionary biology, natural disasters, like hurricanes, have traditionally been thought of as genetic drift-inducing events that will remove individuals from a population at random. However, recent data have called this assumption into question, indicating that natural disasters can act as selective pressure events that can induce morphological changes in a population. However, research to date in this area has been limited to select taxonomic groups. For our project, we studied the invasive Cuban tree frog (Osteopilus septentrionalis), and its response to Hurricane Milton (October 2024). Specifically, we aim to determine if there are significant variations in key morphological characteristics in the same population pre- and post-Hurricane Milton. We collected frogs by hand from the New College of Florida campus in Sarasota, Florida (27.384586, -82.556209), approximately 6.9 miles from where Hurricane Milton made landfall. We collected 28 frogs before Hurricane Milton (08/09/2024) and 60 frogs after Hurricane Milton (10/25/2024). We used calipers to measure limb length and snout-vent-length (SVL) and used ImageJ to measure the toepad area and digit length. Once measurements have been completed, we will run analyses of covariance (ANCOVAs) for each morphological measurement to determine if there are any morphological differences between the pre-and post-hurricane specimens. This data analysis will help to better understand the impact of hurricanes on the invasive species Osteopilus septentrionalis, and potentially provide insight into the role natural disasters play in facilitating natural selection, an important topic in the context of global climate change.

University of Tampa

Using Item Writing Flaws Evaluation Instrument to assess Instructor's Multiple Choice Questions in Introduction to Forensics Undergraduate Classes

Gabrielle Rios

Tamra Legron-Rodriguez

Multiple Choice Questions (MCQs) are a common occurrence on many exams or quizzes for students all over the nation. MCQs are an efficient resource that undergraduate professors and academics use to test their student's foundational knowledge and provide quick grading feedback. There is debate in STEM education about the efficacy of using these items in assessments and how well they measure the student's critical thinking in a foundational class. The Item Writing Flaw Evaluation Instrument (IWFEI) was used in this study to examine MCQs from five instructors teaching an introduction to forensics science courses across the U.S (Breakall, 2019). Measuring each question against the IWFEI consisted of identifying certain criteria and flaws that made up each MCQ item. The MCQs were coded using content analysis under each of the 10 criteria as a "Yes" response, meaning that MCQ followed a criterion, a "No" response, meaning that the MCQ violated the criterion, or a "N/A" response, meaning the criterion did not apply. We found that most of the flaws that were identified were items that could not be answered without looking at the answer choices. Another common flaw were items with "all of the above" as a possible answer choice. Assessing the MCQs in introduction to forensic sciences courses is important to accurately measure and assess student understanding.

University of Central Florida

Investigating Effects of Air Pollution on Plant Development Using the Artificial Production of Acid Rain

Gailen Carrasco

Dr. Chhavi Tiwari

With increasing levels of air pollution, its close tie with acid rain has heightened scientific concern regarding acid rain. Acid rain has been shown to negatively affect crop yield, soil biomass, and nutrient uptake through inorganic aluminum release among other causes. High H+-ATPase levels in plants may indicate a natural endurance against acid rain, and melatonin, glutathione, and silicon may counteract edaphic distress. Three different plant hydration scenarios were simulated across three separate groups of plants–accounting for precipitation potency and plant tolerance among various species. Each group contained one French Marigold, Celosia, and Hermann Ivy. One group was sprayed with spring water, one was sprayed with a low-concentration acid rain mixture, and one was sprayed with a high-concentration acid rain mixture. Spraying and recording were repeated over five days. No plant species displayed superior tolerance to acid deposition, however it was found that having a centralized structure may lessen the effects on height regression. Data further suggested there may be a plateau in height regression among plants affected by acid rain. Results showed the greatest amount of damage from the high-concentration acid mixture–the mixture simulating a high pollution area. The low-concentration acid mixture displayed similar levels of damage. The discovered importance of centralized structure in height retention demonstrates the importance of crop selection in polluted areas. Further, the low-concentration mixture's similar levels of damage indicate a need for intervention, even in areas of relatively low air pollution.

University of Florida

Anhedonia, Worry, and Theta Power: Concurrently High and Low Levels of Anhedonia and Worry Attenuate Reward Prediction Error Signaling

Gavin Heindorf

Dr. Peter Clayson

Worry is related to an exaggerated reward prediction error (RPE) signal regardless of feedback-valence, while anhedonia is related to a larger RPE signal to maximal gains. We used feedback-locked frontal medial theta activity—an index of the RPE signal—to examine the effects of worry and anhedonia on reward valuation following gains and losses. A total of 71 participants completed the effort-doors task while continuous EEG was collected. Worry and anhedonia were measured using the Penn State Worry Questionnaire and the Mood and Anxiety Symptom Questionnaire, respectively. In a multilevel model predicting frontal medial theta power, the two-way interaction between anhedonia and worry was statistically significant. At higher levels of worry, greater frontal medial theta was seen at lower levels of anhedonia than at higher levels of anhedonia. While at lower levels of worry, greater frontal medial theta was seen at higher levels of anhedonia than at lower levels of anhedonia. Simultaneously high or low levels of worry and anhedonia were related to an attenuated RPE signal. Having concurrently high levels of worry and anhedonia is related to a diminished

RPE signal, providing a psychophysiological explanation for the link between affective disorders and worse performance in reinforcement learning scenarios. The effects of anhedonia and worry on RPE signaling are independent of feedback-valence, suggesting their effects are not supported by a tendency towards positive or negative expectations. Anhedonia and worry interact to predict theta-band activity following reward receipt, indicating that affective symptoms effect neural communication during reward valuation.

University of South Florida

The Vaping Project: Vaping Effects on DNA

Genesis Vega

Trinidad Argüelles, M.S., Ed.D.1, Claudia Sánchez, MSFS2, and Maria Monzon Medina, Ph.D.1

E-cigarettes also known as vapes, are devices that stimulate the act of smoking by generating a vapor. This vapor consists of a liquid containing nicotine, propylene glycol, vegetable glycerin and flavoring chemicals. There is a diverse number of flavorings available within the market that have been shown to be a cause of oxidative stress, inflammation within DNA cells and to induce damage amongst other DNA systems. The purpose of this study is to do a literature review on the effects different chemical flavorings have on DNA. The result of the literature review of scientific material related to this study include, samples of human bronchial epithelial cells were exposed to chemical flavorings, Fruit Medley, Classical Menthol, Cool Mint, Créme Brûlée, Cool Cucumber, Just Mango and Cool Virginia. Using aerosols to expose each sample to the chemical flavorings in a controlled environment. The results from each sample were then analyzed using GC-MS (gas chromatography-mass spectrometry), exposing each chemical present within each flavoring. The results of this study concluded, mint/menthol and fruit/sweet flavorings, such as Just Mango, Cool Cumber and Cool Mint, had a greater cause of damage on DNA in comparison to nicotine/no flavoring alone. Raising concern to long-term effects of damage such as epithelial barrier dysfunction, chronic inflammation and oxidative stress.

Miami Dade College

Evolution of Magnetic Ordering in Kagomé-Lattice Intermetallics, LnT6Ge6 (Ln = Gd, Tb; T = Mn, Fe, Co)

Gerald Ciani

Michael Shatruk

Kagomé-lattice materials have garnered substantial interest for their unconventional magnetic and electronic behavior arising from spin frustration between magnetic moments placed on a lattice of vertex-sharing equilateral triangles. Such properties as non-collinear magnetic ordering—or even the lack thereof—and the combination of both localized and delocalized electronic states make kagomé metals interesting for future technological applications in spintronic devices, topological quantum computing, and magnetic storage. Lanthanide (Ln) – transition metal (T) germanides with the LnT6Ge6 stoichiometry possess either ideal or slightly distorted kagomé planes of magnetic T elements, providing ample opportunity to realize new intriguing magnetic and electronic phenomena. Here, we investigate the evolution of properties in LnT6Ge6 (Ln = Gd or Tb; T = Mn, Fe, or Co) by exploring solid solutions LnMn6–xFexGe6 and LnFe6–xCoxGe6. Density-functional theory calculations hint at the possibility of achieving ferromagnetic ordering in the transition-metal sublattice by varying the valence electron count due to the T atoms. We provide our findings relevant to these ideas and discuss future directions of this project.

Florida State University

Introductory Guide on Coral Bleaching

Gianluca Talarico

Amy Bohan

The phenomenon known as coral bleaching has been increasing in both gravity and frequency in the past few years and it has come to threaten many marine ecosystems across the world. However, the amount of media coverage that has been given to the issue is far from being adequate. The average citizen has some vague idea of what the process causes to corals, but it has no idea of the consequences that it has on the marine ecosystem the coral resides in and the cascading effects that can occur to other ecosystems and that can also have harmful effects on human wellbeing especially in coastal areas. My main objective

therefore is to create an introductory guide on the topic that can be easily understood even by people who are not well versed in marine sciences, I will do this by selecting a number of reliable peer reviewed sources from scientific journals that will cover the main aspects of the topic, summarizing their key points and putting together an overview that can be both highly educational and easily comprehensible. The aspects that I will focus on are a brief explanation of the biology of the corals, what changes does coral bleaching cause and the causes behind it and how as a community we can prevent it from endangering our ecosystems. This research will help spread awareness on the topic and hopefully push others to contribute through research or sensible actions.

New College of Florida

Effect of Task Type and Language of Task Elicitation on Pathological Language Mixing in Bilingual Aphasia

Gianna Mineo & Kathleen-Linnea Poindexter

Dr. Gerald C. Imaezue

Unintentional mixing of multiple languages in an utterance (pathological language mixing) may occur in bilinguals with aphasia (BWA) due to stroke. BWA are more likely to mix languages when speaking in their second language (L2) than their first language (L1) (Mooijman et al., 2024). However, the influence of the language used for task elicitation and task type on language mixing in BWA remains underexplored. This single-case study examines whether language mixing varies across task type and whether language deficits persist across all permutations of language task conditions (L1, L2, L1-L2, L2-L1). Participant P3 is a Spanish-English BWA with severe language deficits and moderate-severe language mixing. The Western Aphasia Battery-Revised (WAB-R) was administered in Spanish and English to assess P3's language abilities supplemented by a questionnaire on P3's language proficiency in both languages pre- and post-stroke. Overall, P3's language mixing varied with task types such as responsive speech and picture description tasks. In Spanish tasks, language mixing was prominent in sentence completion (100%), naming (94.73%) and picture description (50%). Additionally, P3's deficits persisted across all conditions (Spanish-only, English-only, Spanish-English, English-Spanish). In the Spanish-only condition, P3 scored 1.8% in naming and an Aphasia Quotient (AQ) of 37.7%. Performance in naming improved to 60.9% (AQ: 49.2%) when both languages were considered. This study suggests that language of task elicitation and task difficulty influence the degree of language mixing in BWA contributing to a better understanding of language mixing patterns in BWA and the role of task-related factors on language performance.

University of South Florida

Males of a fighting insect differ in whether their sexually selected hind leg spines bend or break

Giovanna Avellar Figueredo

Christine W. Miller

Many species have evolved sexually selected weapons in male-male competition. Much remains unknown about how nutrition impacts weapon construction and structural integrity. In the insect Narnia femorata (Hemiptera: Coreidae), males use their spiny hindlegs as weapons to grab and squeeze male opponents in competition over mating opportunities. Previous studies have established in this species that high-quality juvenile nutrition improves injury resistance of the hind leg weapons. Yet, the effects of adult nutrition on injury resistance are largely unknown. Further, we do not know the effects of nutrition on an essential offensive component of the insect's weapon: its spines. For this purpose, adult N. femorata were reared on natural diets varying in quality. Hind legs were removed 28 days post-eclosion. We tested the structural integrity of the terminal femur spine by pressing a force transducer against the spine tip with increasing normal force. A spectrum of responses was observed: some fractured, while others bent strongly without breaking. Strong bending of the spines was also dependent on the flexible cuticle supporting the spine. Insects reared on low-quality diets showed a trend of lower bending and breaking forces. These differences suggest that despite their similar size, shape, and appearance, spines can differ strikingly in their mechanical response. Future studies in this area will examine the degree to which spine bending or breaking affects performance in male-male competition.

University of Florida

Studying Aggression & Theory of Mind Through a Cooperative LEGO Building Task

Grace Flatscher & Jenna Redmond

Dr. Jennifer Blessing

This study explores the relationship between aggression, theory of mind (ToM), and personality traits, including the Dark Triad (narcissism,

psychopathy, and Machiavellianism), through a cooperative LEGO building task. ToM, the ability to understand others' perspectives, is crucial for social interactions, while deficits in ToM have been linked to increased aggression (Markiewicz et al., 2023; Webster et al., 2014). The study examines how ToM, aggression, and Dark Triad traits influence communication and collaboration in college students. Pairs of participants engaged in two LEGO-building tasks, alternating as instructors and builders. Instructors guided their partners using verbal instructions without naming colors or showing the model, fostering reliance on perspective-taking and creativity. Participants then completed executive function tasks, ToM measures, egocentrism assessments, and questionnaires on aggression and the Dark Triad. Preliminary results from 36 college students (M = 18.9 years, SD = .9) reveal intriguing patterns. Verbal aggression positively correlates with participants' confidence in their instruction abilities ($r = .333$, $p = .047$). Egocentrism, particularly the personal fable dimension, correlates with anger ($r = .447$, $p = .007$) and hostility ($r = .374$, $p = .025$). Egocentrism is also linked to the Dark Triad ($r = .368$, $p = .030$) and Machiavellianism ($r = .398$, $p = .018$). Additionally, psychopathy negatively correlates with a ToM measure ("Reading the Eyes") ($r = -.347$, $p = .041$). These findings highlight the interplay between egocentrism, aggression, and personality traits, suggesting their impact on social and interactive skills. Data collection will continue until 100 participants are included.

University of Tampa

Aging Popular Exoplanet Host Stars; A Bayesian Analysis of Stellar Evolution

Grace Henry

Dr. Ted von Hippel PhD

The discovery of exoplanets beyond our Solar System has transformed our understanding of planetary science and the potential for life elsewhere in the Universe. This project analyzes stellar ages and properties for a sample of stars hosting exoplanets in their habitable zones, utilizing the BASE-9 (Bayesian Analysis of Stellar Evolution) software suite. BASE-9 employs a Bayesian framework to model stellar parameters by integrating photometric, spectroscopic, and astrometric observations. This method provides posterior probability distributions for stellar parameters, offering robust estimations that account for uncertainties and correlations.

The primary goal of this study is to refine the age estimates of exoplanet host stars, a crucial factor in assessing the long-term habitability of their exoplanets. The sample includes five well-characterized stars—Mu Arae, Upsilon Andromedae, HD 11964, HD 4732, and HD 73534—all of which host exoplanets within their respective habitable zones. The resulting stellar age estimates are 7.02, 3.60, 8.23, 3.31, and 4.06 billion years, respectively. These findings are analyzed in the context of exoplanet habitability and stellar evolution.

By improving the precision of stellar age estimates, this research advances our understanding of the evolutionary history of stars with potentially habitable exoplanets. The study highlights the importance of sophisticated modeling tools like BASE-9 in exoplanet research, demonstrating how Bayesian techniques can yield more accurate and nuanced insights. Ultimately, this work contributes to a broader comprehension of the conditions that may support life in other star systems and informs future studies in planetary science and astrobiology.

Embry-Riddle Aeronautical University

Exit Flow Characteristics in Planar Symmetric and Asymmetric Nozzles at Different Nozzle Pressure Ratios

Grayson Hayes & Donald Tuten

Dr. Surabhi Singh

This project aims to understand the affect which Nozzle Pressure Ratios (NPRs) hold on the exit flow characteristics of planar symmetric and asymmetric nozzles. Research such as this is important for applications in rocket engines, where these nozzles are commonly used. By properly understanding the effects of asymmetry on the exit flow, the performance of these configurations can be improved. When a nozzle is designed, it is designed to operate at a specified NPR. At this design NPR, the flow will perfectly expand resulting in a uniform, supersonic jet at the exit of the nozzle. In cases where the nozzle is operating at conditions referred to as off-design, this exit flow will change depending on the NPR. In these off-design cases, the exit flow will either become overexpanded (when the pressure of the jet is less than the ambient pressure) or it will become underexpanded (when the jet pressure is higher than ambient). Such off-design conditions are observed at various flight altitudes and hence are important to quantify nozzle performance. By using Z-type Schlieren, an experimental flow visualization technique, to capture both qualitative and quantitative data about the exit flow coupled with computational fluid dynamics (CFD) simulations on both

symmetric and asymmetric nozzles, these exit flow characteristics can be quantified and reported on to gauge the effects which asymmetry plays on the jet. With this data, the difference in performance decay between symmetric and asymmetric nozzles can be better characterized and applied to future vehicles.

Embry-Riddle Aeronautical University

Impact of Subclinical Hypothyroidism on Cardiovascular Health and Quality of Life

Hadi Quefatieh, Trisha Pitchala, Dea Fejzo, Nikhil Chainani, Edison Johnson, Jalal Jamil, John Lingam & Zein Hamdan

Dr. Olukemi Akintewe

Subclinical hypothyroidism (SH) is characterized by elevated Thyroid-Stimulating Hormone (TSH) levels while free thyroxine (T4) remains normal, affecting approximately 3%-15% of the population, thus warranting further research. Method triangulation was employed to review studies from various databases, including PubMed, using targeted keywords to identify relevant research. Often caused by Hashimoto's Thyroiditis, SH is prevalent among older adults, women, and certain ethnic groups. It contributes to cardiovascular disease (CVD) through mechanisms such as dyslipidemia, endothelial dysfunction, and increased arterial stiffness, which lead to hypertension and cardiovascular strain. Research reveals a significant association between SH and an increased risk of congestive heart failure (CHF) and coronary heart disease (CHD). In children, untreated SH is linked to higher blood pressure, elevated lipid profiles, and increased arterial stiffness, emphasizing the need for monitoring and treatment to mitigate cardiovascular risks. Untreated SH patients often have high levels of total and LDL cholesterol, increasing their CVDrisk. Levothyroxine treatment can improve lipid profiles, lower blood pressure, and reduce arterial stiffness, thereby mitigating cardiovascular risks. However, treatment does not consistently enhance quality of life (QoL), with patients frequently experiencing persistent fatigue, cognitive impairment, and reduced well-being. Long-term data suggest that younger patients, males, and those with lower baseline cardiovascular risk benefit more from treatment. Understanding the complexities of SH treatment is crucial for improving long-term health and QoL in affected individuals. Further research is necessary to establish best practices for managing SH to mitigate cardiovascular risks and enhance patient outcomes.

University of South Florida

Impacts of Sediment Grain Size on Seasonal Dune Restoration

Hailee Belcher

Peter Adams

Coastal sand dunes are essential for protecting communities from storm surge flooding while supporting diverse ecosystems. Despite their importance, the factors influencing dune recovery, particularly the role of sediment grain size, remain poorly understood. This study aims to investigate the relationship between sediment grain size and dune recovery at Matanzas Inlet, Northeast Florida, to identify sediment characteristics that optimize natural restoration.

Sediment samples are collected seasonally from the frontal dune crest, frontal dune toe, berm, and swash along a transect spanning markers RM156 to RM196A. Grain size distribution is analyzed using the Malvern Mastersizer 3000, a laser diffraction particle size analyzer, to categorize the sediment into fractions ranging from 2 mm to 1/16 mm. Spatial and temporal sediment movement patterns are mapped using ArcGIS to understand their role in dune recovery driven by aeolian transport.

Preliminary results indicate that finer grains (<1/8 mm) are more effective in contributing to dune recovery due to their higher mobility under wind transport. These findings are expected to assist in identifying coastal zones with high recovery potential and inform targeted beach renourishment efforts.

By identifiying the link between sediment characteristics and dune recovery, this research advances the understanding of coastal geomorphology and provides actionable insights for enhancing the resilience of coastal ecosystems. This work supports the development of sustainable management strategies to protect vulnerable coastal communities from increasing storm risks.

University of Florida

Do different brands of environmentally friendly paints affect forensic paint analysis?

Hailee Leach

Dr. Erika Doctor

Paint chip analysis is an essential part of forensic trace evidence in many cases. Standard paint chip analysis is performed via attenuated total reflectance infrared spectroscopy (ATR-FTIR). This process allows an examiner to identify the chemical fingerprint that may be unique to the paint and identify the components used to

manufacture the paint, including the binders. This study is a continuation of a previous study to determine if environmentally friendly paints present new problems in forensic sciences. Some environmentally friendly paints function as an absorber of volatile organic compounds, including ECOS and Sherwin Williams. In the previous study,ECOS paints showed a significant difference in chemical makeup over time. This study was to demonstrate if the same was true of the SuperPaint® Interior Acrylic with Air Purifying Technology, produced by Sherwin Williams, which claims it "helps reduce volatile organic compounds (VOCs) from potential sources like carpet, cabinets, and fabrics." To conduct this experiment, the Sherwin-Williams paint was painted on wooden craft sticks in two coats and labeled S1-S5. The backside of the stick was divided into four sections. The sections allow for multiple portions of the stick to be analyzed and for the readings to be within a consistent area each time. To analyze the readings, the spectra intensities of chosen wavenumbers from each time point is placed in a box and whisker plot. The time points are then compared to determine if a statistical difference has occurred.

Lynn University

Marlise Muñoz: Trapped on Life Support

Hailey Citrenbaum

Dr. Lindy Davidson

Marlise Muñoz was declared brain-dead at John Peter Smith Hospital, where she remained on life support against her wishes. Her providers argued that because Mrs. Muñoz was 14 weeks pregnant, she applied to the Texas Advance Directives Act. This law prohibits the removal of life-sustaining treatment from pregnant women, regardless of an advance directive (or documented wishes). Supporters of Mrs. Muñoz unanimously agreed that her brain death made her inapplicable to the law as she had no life to sustain. Clinging to their argument, the hospital refused to provide her family with medical records confirming her diagnosis. The state court ruled in favor of discontinuing life support. Is it justifiable to go against Marlise's expressed wishes and autonomy to "comply" with the Texas Advance Directives Act in hopes of delivering the fetus? I will discuss how meaningful dialogue and accepting fallacies in our arguments can minimize the outcome of a high-profile ethical situation. Every ethical scenario in medicine is unique, creating layers of complexity that may be difficult to address through the law. Given this, healthcare providers should strive for a greater focus on communicative practices to find common ground with patients and their families. Mrs. Muñoz would have been removed from life support much sooner had the hospital acknowledged flaws in their reasoning and handed over the medical records upon request. Communication bears significance in every discipline, so these practices can and should be applied to resolve conflicts in various contexts.

University of South Florida

Outcomes and Resource Utilization of Normothermic Machine Perfusion and Cold Storage in Liver Transplantation

Hailey Mangio & Giovanna Pires Casarejos Pecin

Dr. Vijay Subramanian

This study aimed to compare post-transplant survival and resource utilization between liver transplant recipients based on donor liver preservation method: normothermic machine perfusion (NMP) versus static cold storage (SCS). We conducted a retrospective cohort study of adult liver transplant recipients between January 2020 and April 2024 at a single center. Recipients were stratified into NMP and SCS cohorts. The primary outcome was post-transplant survival rate. Secondary outcomes included recipient and donor demographics, intraoperative factors, resource utilization, and hospital-related events including post-transplant complications. The study included 753 patients, with 31.5% in the NMP cohort and 68.5% in the SCS cohort. Survival rates were comparable between cohorts ($p=0.587$). The NMP group had lower Model for End-Stage Liver Disease (MELD) scores ($p<0.05$), higher donor risk indices ($p<0.05$), and greater use of donation after circulatory death (DCD) livers ($p<0.001$). Intraoperative blood product use and estimated blood loss were significantly lower in the NMP cohort ($p<0.001$). Post-transplant events including lengths of stay, readmission rates, and incidence of stage 3 acute kidney injury were comparable between cohorts, but the incidence of non-anastomotic biliary strictures was significantly lower for the NMP cohort ($p=0.005$). In conclusion, NMP utilizes higher-risk organs, such as DCD livers, without compromising survival rates. NMP is associated with improved surgical outcomes and no perceived increase in resource utilization. Our data suggest NMP may be a viable and effective method for expanding the donor pool while maintaining patient outcomes.

University of Florida

UV-Altered Macrophages: Impact of UV Radiation on Phagocytic Receptor Expression in M2 Macrophages and Implications for Tissue Repair and Immunosuppression

Hala Hafez

Nicole Verity

Ultraviolet (UV) radiation, particularly UVB, is a well-known environmental stressor that not only damages DNA but also alters immune cell function. Macrophages, essential players in tissue homeostasis and immune defense, adapt to the dynamic environment, including UV exposure. Among macrophage subtypes, M2 macrophages are crucial for resolving inflammation and promoting tissue repair, yet the effects of UV radiation on their function remain poorly understood. This experiment aims to explore how UV exposure impacts the expression of phagocytic receptors on M2 macrophages—key molecules involved in clearing pathogens, debris, and apoptotic cells. Specifically, we will investigate changes in receptor expression following UV exposure and delve into the molecular pathways that govern these alterations using real-time quantitative PCR (rtqPCR). Given the pivotal role of M2 macrophages in tissue repair and immune suppression, understanding how UV radiation disrupts their receptor function could unveil new mechanisms behind UV-induced immunosuppression and chronic skin inflammation. This research seeks to bridge a critical gap in our knowledge, potentially informing therapeutic strategies to mitigate the detrimental effects of UV exposure on immune function and tissue homeostasis.

University of Central Florida

The Role of Threat Responses in PTSD Severity Among Youth Polyvictims: Exploring Fight, Flight, and Freeze Responses as Moderators

Halli Van Den Heuvel

Dr. Norman B. Schmidt

Background: Youth polyvictims—individuals exposed to multiple forms of victimization—face heightened risks of severe PTSD into adulthood. Individual differences in cognitive risk factors are known to influence PTSD severity, but the role of specific fear responses—fight, flight, and freeze—remains underexplored. Fear responses are critical to examine because they represent foundational survival mechanisms that may exacerbate PTSD symptoms. This study investigates how these responses moderate the relationship between polyvictimization and PTSD severity to inform targeted interventions.

Method: Youth polyvictims (n = 491, 61% female, Mage = 45.37, SDage = 12.54) completed measures looking at youth victimization, threat responses, and current PTSD symptoms. Moderation analyses observed threat responses as moderators with victimization status to affect PTSD severity.

Results: Results indicated that flight responses significantly moderated the relationship between polyvictimization status and PTSD severity ($b = .28$, $SE = .13$, $p < .05$), while fight ($b = .21$, $SE = .21$, $p = .31$) and freeze ($b = .20$, $SE = .16$, $p = .22$) responses did not. The flight model was significant ($F(3, 435) = 31.65$, $p < .001$, $R^2 = .17$).

Conclusions: These findings highlight the role of flight responses in worsening PTSD among polyvictimized youth. Avoidance or escape behaviors may hinder trauma processing and reinforce maladaptive coping, leading to hyperarousal and intrusive symptoms. Targeting flight behaviors in trauma-focused interventions could reduce PTSD severity by promoting healthier coping mechanisms. Future research should replicate these findings in diverse samples and explore mechanisms underlying flight responses to enhance intervention effectiveness.

Florida State University

Investigation on Singaporean Information Literacy Practices

Han Le

Christopher Randles

Information literacy (IL) is the ability to access, evaluate, and use information effectively and ethically, a vital competency in scientific disciplines. In the U.S., minimal IL standards have raised concerns about the need for stronger IL skills, particularly due to the constant exposure and risks to misinformation in the digital information landscape. To assess IL aptitude in U.S. education, we previously surveyed Central Florida postsecondary chemistry educators, revealing educator uncertainty and inability to implement effective IL programs. Educators cited systemic and academic challenges as barriers, despite widespread agreement on IL's importance. To address these challenges, we decided to explore international IL models that have made notable progress, namely Singapore. Through review of existing literature, Singapore has been observed to have established a comprehensive IL framework by embedding it into the national curriculum, focusing on digital literacy and lifelong learning.

This integration is backed by initiatives from government-supported programs such as the ICT Masterplan, which promotes educational innovation and professional development. To explore how these strategies can inform U.S. IL education, we have probed at the Singaporean education space to better understand IL instruction and its integration to investigate how their methodical approach and cultural pressures have influenced IL outcomes and practices. By analyzing the results, we aim to identify adaptable, informed practices that address systemic barriers and promote effective IL strategies in Chemistry/Science that could be tailored to the U.S. educational context at both the K-12 and higher education level.

University of Central Florida

Understanding Cultural Genocide in Current Political Contexts: Three Errors in Scholarship

Hanna Kobs

Dr. Michael Burch

In the current global political context, loopholes in international law and global norms allow extensive violations of minority rights for the purpose of counter-terrorism or the safety of the state. One such violation, "cultural genocide," has become embedded in discourse on human rights and genocide. Scholarship defines cultural genocide as the intent to destroy a group through targeting the language, religion, cultural figures, and other acts that endanger the group's culture. Through an analysis of primary legal documents and scholarly work on genocide and human rights, I argue there are three errors scholars make when applying the term cultural genocide. First, scholars assume the intent to physically destroy the group is required for cultural genocide. In addition, an over-reliance on past court decisions has erroneously shaped scholars' understanding of when genocide might occur. Third, the Holocaust is often synonymous with genocide, resulting in a hesitancy to declare cultural genocide for fear of undermining the Holocaust experience. These three errors lead to scholars overlooking the need to establish cultural genocide as a legal term. Scholarship must begin to explore cultural genocide as its own unique concept. By examining the Chinese Communist Party's policies in Xinjiang I will demonstrate how these three errors result in cultural genocide being divorced from its current political context. Scholarship must begin to move past assumptions centered on physical destruction of groups and explore how cultural genocide operates as its own category.

Eckerd College

Enteral Nutrition Intolerance among pALS: a Retrospective Chart Review

Hannah Baumer

Andrea Charvet

This study aimed to assess gastrointestinal (GI) intolerance to standard milk protein and plant protein-based enteral nutrition (EN) formulas in people with amyotrophic lateral sclerosis (pALS) using gastrostomy tube (Gtube) feeding. ALS, a progressive neurodegenerative disease, often requires EN when oral intake becomes insufficient, and GI intolerance to EN can hinder nutritional goals and reduce quality of life. This retrospective chart review analyzed partial data from 24 pALS enrolled at the NSU Cathy J. Husman ALS Clinic between January 2021 and December 2023. Patients were receiving either milk or plant-based commercial EN formulas via Gtube, with follow-up data on EN intolerance within six months of initiation. Preliminary findings indicated 37.5% of patients reported signs and symptoms of GI intolerance within 6 months post EN initiation, with 20.8% being associated with EN formula intolerance. Along with this, the prevalence of GI intolerance was similar in patients receiving milk-based and plant-based formulas (45.8% vs. 54.2%, p=0.363). When formula intolerance was not the perceived cause of GI intolerance, 50% of the cases were attributed to EN administration method or rate, 25% to new medications, and 25% to other factors. Despite 45.9% of cases displaying some degree of malnutrition at EN initiation, there was no statistically significant correlation between GI intolerance and degree of malnutrition (p=0.568). These findings suggest that EN administration methods and medications may be more critical factors in managing GI intolerance in pALS than the type of formula received. Further research is needed to optimize EN strategies for this population.

Nova Southeastern University

Fanfiction as a Reflection of Available Representation: A Critique on Mass Media

Hannah Benton

Dr. Stephanie Wheeler

With the lack of reputable disability representation in popular superhero media, fans turn to fanfiction to write the representation they long for. This absence of proper representation in media can feel like the erasure of disability, and in compensation, fanfiction paves the way for authentic representation in media. Fanfiction authors do this by reacting to specific choices made by the

mass media outlets through their creations. Fan studies scholars have examined fan reactions for decades, categorizing them into two groups: affirmative (agreeing with the source material) and transformative (disagreeing with the source material). Affirmational fans interpret the canon text without challenging its ideologies, expanding upon it in ways that remain consistent with the original narrative. Transformational fans challenge and shift the canon text into something different. Fanfiction is considered a transformative reaction. Informed by disability studies and fan studies, this research aims to study fan reactions around disability to understand what it is they affirm/transform from the source material. When a disabled identity is explored in the canon, do the fanfictions respect it? Or do they choose to alter it? What about an able-bodied identity? What facets of identity are the ones that receive alteration as opposed to approval? By analyzing 2,000 fanfictions within the MCU and DCU, this rhetorical critique will encourage future rhetoricians to think critically about the realities they affirm/transform from media representations. In doing so, this research will contribute to the ongoing conversation regarding the responsibility of artist and audience.

University of Central Florida

Beard Length and the Efficacy of an Aviator Oxygen Mask

Hannah Lyons, Courtney Louderback & Allysa Hayden

Dr. John French

Introduction: Facial hair is prohibited for most airline pilots because of the widespread belief that the seal on oxygen masks might be rendered ineffective, preventing aircrews from performing their duties during emergencies. Continuous oximetry recordings were made every second from 24 volunteers wearing a standard commercial airline mask in one of 3 beard conditions: no beards, short beards (< 10 mm in length) and long beards (< 10 mm in length) in a normobaric hypoxia chamber at 30,000 ft (10,000 m). Masks were worn in the chamber for about 10 minutes before being removed for about 2 minutes to experience hypoxia. Once returned to normoxia, volunteers were exposed to smelling salts held directly under the chin. None of the beard conditions differed in the time to don the masks. There were no differences in the arterial saturation percent of oxygen (SpO2) between beard conditions for either mask-on or mask-off segments in the chamber. There were significant differences in SpO2 comparing the mask-on segment to the mask-off segment, indicating that hypoxemic conditions would have been detected had the masks been ineffective. Using a current on-demand airline oxygen mask, SpO2 levels were never compromised by any of the beard conditions. Because the highly volatile smelling salts were imperceptible through the masks, smoke and other noxious irritants would not be perceived. These results support the contention that airline pilots with beards of any length would not be impaired by hypoxia or smoke while dealing with an inflight emergency.

Embry-Riddle Aeronautical University

The Relationship Between the Time Spent on TikTok and Instagram and College Students' Self-Perception of their Social Media Addiction

Hannah Zuniga, David Jimenez, Tobias Garland, Lily Achins, Evan Casterline & Eliana Sharper

Jessica Kester

Due to the rise of social media popularity, college students' self-perception of their social media addiction requires examination. Other researchers have found that social media addiction (SMA) can be compared to other forms of addiction and its users can develop similar psychological dependencies (Robinson & Smith, 2024). The goal of the current research is to find if college students who self-report higher social media use also self-report more symptoms of SMA. The researchers created a survey using The Smartphone Addiction Scale Short Version (Viola, 2021, p.13) and the Beck Depression Inventory scale (1961) to examine self-perceived social media addiction in Daytona State College students. 62 Daytona State College students were surveyed using the modified survey to determine their self-perceived time spent on TikTok and Instagram and their symptoms of social media addiction, and were divided into low, mid, and high frequency social media use categories based on their responses. The study results suggest that individuals categorized as high frequency users reported higher levels of SMA symptoms than those in the low frequency category. In addition, there was statistically significant data that high frequency users were more easily distracted than low frequency users in both personal and academic environments.The study was limited to a small sample size due to the short data collection period and having been administered at one college. Future researchers could attempt to improve outreach by surveying students at multiple colleges and having a longer data collection period.

Daytona State College

Analysis of Neogloboquadrina pachyderma (N. pachyderma) and Neogloboquadrina incompta (N. incompta) in the North Atlantic (N. Atlantic) as a Proxy for Ocean Temperatures from ~280-11,600 yrs ago

Hannah-Louise Burd & Mackenzie Taylor Cole

Dr. Patrick Rafter

This research focuses on the effects of climate change and sea surface temperatures fluctuation/ rise in the N. Atlantic ocean. The species abundance of two planktic foraminifera, N. pachyderma (tolerates colder environments) vs. N. incompta (tolerates warmer environments), can be used to measure temperature shifts over time by using previously established temperature proxies. Our research specifically focuses on a core from site IODP U1304B in the N. Atlantic ocean acquired in October of 2004. The sections of the core analyzed reach a total of 294cm into the sea floor, dating back to ~11,586 years ago, based on C-14 data models. From these depths, a split sample of every 5 cm was counted for abundance of N. pachyderma and N. incompta. The data collected appears to correlate with current data, sampled at 20 cm increments, of sea surface temperature fluctuation. Further analysis of samples past 294cm of the IODP U1304B core is required to examine earlier periods, such as those closer to the last glacial maximum.

Eckerd College

Investigation of Health Literacy as a Critical Determinant of Asian American Immigrant Health

Harrison Tsai & Ngan Mai

Jennifer Winston

Health disparities exist among different Asian American immigrants regardless of the misconception that Asian Americans are educationally and financially more successful than other ethnic groups, which contributes to the overlooked support in understanding actual health outcomes. According to a study conducted by the University of Minnesota in California in 2015, Filipino immigrants displayed the highest level of health literacy while Chinese, Korean, and Vietnamese immigrants had the lowest levels. Recognizing the study's limits on the factors that influence the data to be different between Asian American immigrants, this study aimed to systematically evaluate the factors impacting health literacy level, a critical determinant of immigrant health. We conducted a scoping review of 52 articles on the PubMed Library database, utilizing the following search terms: immigrant, Asian, Chinese, Vietnamese, Korean, health literacy, and United States. Our findings identified most immigrants' literacy difficulties including English proficiency, income, and health insurance status. Additionally, culture-specific barriers, including modesty and the use of oriental medicine, were overlooked despite its high prevalence. By understanding the causes of heterogeneity impacting immigrant health literacy levels, the study illuminates probable avenues of intervention to promote health knowledge for the Asian American immigrant community.

University of South Florida

Exploring Treatments for Depressive Symptoms in Patients with Parkinson's Disease

Roy Chen & Madison Bonaventura

Tanjina Jalil

As the United States' second most prevalent neurodegenerative disease, Parkinson's disease (PD) threatens elderly patients with its motor and non-motor symptoms. Namely, depressive symptoms, which cause suicidal ideation, is a common comorbidity of PD. Using Rayyan for managing citations, this study searched through PubMed and EMBASE using key search terms: "Parkinson's disease," "major depressive disorder," and their Medical Subject Headings' synonyms. The preliminary findings focus on PubMed's 1,758 search results. This systematic review included peer-reviewed studies published in the last ten years written in English. However, it excluded review articles or studies that do not focus on medical treatments for both PD and depressive symptoms. After screening 1,758 PubMed references, 17 citations were included, which involved 16 randomized control trials and 1 case study. To assess depression's severity, 10 studies used the Hamilton Rating Scale (HRS), and 5 studies used the Montgomery-Asberg Depression Rating Scale (MADRS). Drug treatment was the most extensively studied, with 7 out of 17 articles evaluating anti-depressant drugs. Across three studies, repetitive transcranial magnetic stimulation reduced depression's severity, but it may not be as effective as anti-depressant drugs. Using cognitive behavioral therapy, two studies decreased depressive symptoms in PD patients. Despite inconsistent results, deep brain stimulation also decreased treatment-resistant depression and PD's symptoms across two studies. In the future, this study will screen and analyze similar

medical literature from EMBASE using the same methodology. By comparing treatment methods, this study supports the development of effective remedies for depressive symptoms in PD patients.

University of South Florida

Viola-Jones Algorithm Integration for Face Detection and Recognition in Autonomous Vehicles

Buchizya Mwase & Bongiwe Sandi

Juan Calderon

As autonomous vehicle technology continues to evolve, the development of advanced safety systems has become a priority. This project explores the integration of face detection and recognition technologies to enhance the safety and functionality of autonomous cars. Using the Viola-Jones algorithm, widely recognized for its real-time detection capabilities, the project aims to deliver reliable performance in diverse driving scenarios.

The system is designed to detect individuals within the vehicle and accurately identify the driver, enabling features such as driver authentication and monitoring. By improving detection speed and recognition precision, this innovation supports key objectives like accident prevention, enhanced security, and theft deterrence.

The project's initial phase has successfully implemented a face detection module based on the Viola-Jones algorithm, achieving robust results across varying environmental and lighting conditions. Future development will focus on refining the system's ability to differentiate between individuals, laying the groundwork for personalized vehicle settings and improved safety measures.

This work seeks to establish a new standard in autonomous vehicle safety by showcasing the practical applications of facial recognition technology. By combining innovation with real-world utility, the project aims to contribute to safer and more secure transportation systems for the future

Bethune-Cookman University

Identification of Regulatory Roles for Stress Responsive Transposable Elements in Rice

Emalynn Tobias

Navi Gill

Transposable elements (TEs) are widely known for their structural and functional roles in the rice genome. They can be activated in response to various biotic and abiotic stresses. As the global temperatures rise, heat stress threatens crop production worldwide by affecting grain quality and yield. Concern for food security amidst a growing population warrants development of novel methods to study regulation of gene expression in response to heat stress. Two japonica rice varieties, Cypress and LaGrue, perform well and poorly, respectively, under high night temperatures (HNT) based on their ability to withstand heat stress during growth and development. Using these contrasting genotypes and their varied response to HNT conditions, we designed this study with an objective to understand how transcriptionally active TEs affect gene expression. Total RNA was sequenced from caryopsis tissues at R6 stage under HNT (82.4 ± 1˚F) and control (72 ± 1˚F) conditions. The data was analyzed to identify Differentially Expressed Transposable Elements (DETs) at log2FC<=1 and padj<0.05. We identified 139 transposons that are differentially expressed (up- or down- regulated) between the HNT and control conditions in Cypress and LaGrue, of which 77 were differentially expressed in a Genotype x Environment manner, suggesting a genotype-dependent response to stress. Additionally, we identified 91 GaTEs (Genes Associated with Transposable Elements) based on their genomic locations. A comprehensive genomic analysis is underway to determine the regulatory roles of DETs in gene function, and to explore the epigenetic regulation of TEs and its effect on neighboring genes.

Nova Southeastern University

Ecomorphological Variation Across Urban vs Rural Populations of Invasive Cuban Treefrog (Osteopilus septentrionalis)

Abigail Kirkpatrick

Professor Jacob LaFond

One of the central questions of biology is to understand how organisms adapt to their environment. The budding field of ecomorphology has provided insight into these adaptive processes, demonstrating how organisms in similar environments can convergently evolve similar body plans or ecomorphs. Recent ecomorphological studies have indicated that adaptive ecomorphs can vary significantly in the face of anthropogenically-driven selective pressures. However, these ecomorphological studies have been limited to a small number of taxa. For our project, we studied invasive populations of the Cuban treefrog (Osteopilus septentrionalis) to

determine how predictable ecomorphological patterns are in an understudied taxonomic group. Specifically, we aim to 1) determine if there are significant differences in the limb length or toepad area of O. septentrionalis populations in urban vs. rural environments, and 2) determine if the same ecomorphological patterns evolve consistently in different urban populations. To date, 59 individuals have been collected from two rural sites and 120 individuals from two urban sites. For each specimen we used calipers to measure limb length and SVL, and ImageJ to measure toepad area and digit length. For each morphological measurement, we will run an analysis of covariance (ANCOVA) to determine if limb length or toepad area differs significantly between populations of rural/urban populations. This research will provide insight into the ecomorphology of an understudied taxon to determine how repeatable ecomorphological patterns are and will allow us to gain insight into the rapid evolution of a harmful invasive species in the context of anthropogenically-driven selective pressures.

University of Tampa

Poster Session III – Abstracts

Preference of a weevil pest, Listronotus sparsus, for six apiaceous crops grown in Florida

Hayden Mickley

Julien Beuzelin

Florida's Everglades Agricultural Area (EAA) plays a crucial role in producing apiaceous crops for national markets in the winter. Since 2020, celery and parsley growers in the EAA have faced unexpected damage caused by Listronotus sparsus weevils, previously not recognized as crop pests. The larvae of these weevils pose a significant threat to celery, parsley, and other apiaceous crops, by tunneling through petioles, crowns, and roots. The reasons for the weevil's emergence as a pest remains unclear, but changes in production practices, insect biology, or weather patterns could be contributing factors. This project aims to determine the preference of L. sparsus adults for celery, parsley, cilantro, dill, carrot, and fennel. In a first lab experiment, the six apiaceous crops will be grown in the greenhouse for six-eight weeks before the foliage of each crop will be tested against a plastic plant control in a binary choice design. In a second lab experiment, the six crops will be grown similarly, but instead of a binary choice, all crops will be tested together in a multiple-choice design. For each lab experiment, the number of weevils feeding on crop foliage will be recorded 24 hours after weevil release. In a field experiment, the six crops will also be grown in the greenhouse and then transplanted to field plots following a randomized block design with four blocks. Once every other week for 6 weeks, eight plants will be collected in each plot, and weevil injury and infestation levels will be recorded.

University of Florida

Purposeful Play in Action: Extending Museum Engagement to the Home

Heather A. Berwanger & Allison R. Wieland

Dr. Stephen Blessing

Purposeful play is essential to children's development, fostering cognitive, physical, social-emotional, sensory, and communication skills (Bodrova & Leong, 2007). While children's museums provide interactive environments that support these outcomes, parental involvement is crucial to extending these benefits into the home (Perry, 2019). This study examines how digital tools can enhance parental engagement and create a continuous learning environment bridging museum experiences and at-home activities. In partnership with the Glazer Children's Museum and the University of Tampa's Computer Science department, we developed an innovative website featuring research-based activities aligned with five core playstyles. The platform offers caregivers strategies to promote purposeful play, supporting meaningful engagement in both museum and home settings. Using a mixed-methods design, we collected data from 104 families during museum visits and one week post-visit. Results demonstrated that caregivers found the website accessible, informative, and effective in enhancing their understanding of purposeful play. Caregivers reported increased confidence in facilitating enriching play activities, leading to more interactive and developmentally beneficial experiences for children. Our findings highlight the potential of digital tools to empower caregivers and extend the impact of museum visits into daily life. Purposeful play, particularly for at-risk children, promotes critical life skills such as empathy, self-regulation, and metacognition (Allee-Herndon & Roberts, 2021). By fostering play-based learning, digital platforms can address achievement gaps and support holistic child development, emphasizing the importance of integrating purposeful play into both museum and home environments.

University of Tampa

Pododermatitis (Bumblefoot) in Seabirds: Treatment and Prevention at Pelican Harbor Seabird Station

Heather Rose Hernandez

Christopher D. Williams

Pododermatitis (Bumblefoot) in Seabirds: Treatment and Prevention at Pelican Harbor Seabird Station

Heather Rose Hernandez, De 'Ajah Wiggins,

Under the direction of Dr. Renata Schneider, Dr. Christopher Williams

Marine and Estuarine Biology

Bumblefoot, clinically termed pododermatitis, is a bacterial infection that affects the plantar surface of birds' feet. It can lead to significant pain, mobility challenges, and systemic complications if untreated. This study retrospectively analyzed bumblefoot cases presented to the Pelican Harbor Seabird Station (PHSS) between 2019 and 2024, where 36 avian species were affected, with seabirds predominating. We identified primary factors contributing to infection, such as foot injuries, suboptimal perching, and obesity. A classification system based on infection severity, ranging from Grades I to VII, was used to categorize cases. Treatments were tailored by severity, including antibiotic administration, chlorhexidine and iodine soaks, Epsom salt applications, laser therapy, and bandaging. Two case studies exemplify the variability in treatment: a Cooper's Hawk with Grade V bumblefoot and a Laughing Gull with Grade III. Both cases showed recovery following structured treatment protocols, highlighting the effectiveness of laser therapy and chlorhexidine as key interventions. Continued refinement of treatment protocols and preventive measures, such as improved perching environments and regular health assessments, are emphasized to minimize future occurrences of bumblefoot.

St. Thomas University

AI Chatbots affect on Social Connections

Hedda Forsman & Hyann Jimenez Ruiz

Michael Irias

This study investigates the complex interplay between interactions with socially oriented artificial intelligence (AI) and human social connections. The research, conducted as a three-week longitudinal experiment with a randomized closeness intervention, aims to explore how engagement with large language models (LLMs) affects the quality and quantity of human relationships and vice versa. Key objectives include examining the bidirectional impact of AI interaction on human connections, moderating factors like trust and individual differences, and the effects on well-being, depression, and social anxiety. Participants, comprising 200 undergraduate psychology students from Florida State University, engage with two AI platforms: Character.ai and a custom in-house AI application. The intervention involves structured "fast-friends" exercises to elicit AI-human closeness for half the participants while the remainder experience unstructured interaction. Daily diary entries lasting for 3 weeks and follow-up surveys for 2 weeks assess social dynamics and psychological well-being changes. The study's primary endpoints focus on shifts in human social connections. These shifts are measured through self-reports, established psychological scales, and interaction logs. The secondary outcomes evaluate well-being and mental health. Data analysis will explore mitigating factors like attachment styles and personality traits. The findings will enhance the collective understanding of AI's role in social landscapes, giving insights into potential benefits and risks in the evolving human-AI relationship.

Florida State University

Bridging the Gap Between Brain Activity and Prosthetics with AI and Neuroimaging

Henrique Oliveira Gamonal de Castro & Anthony Valverde Kong`

Benjamin Jacob

Prosthetic devices designed to mimic the mobility and agility of a natural limb often require weeks to months of intensive physical therapy, placing a significant physical and mental strain on patients. Although these devices allow for patients to perform a defined range of tasks, they frequently exhibit limitations in functionality, adaptability, or ease of use, falling short at helping a patient return to their everyday life. This research explores how integrating artificial intelligence (AI), brain-computer interfaces (BCI), high-density electrodes, and neuroimaging techniques (fNIRS and fMRI) can enhance brain signal identification and prosthetic leg control, improving the quality of life for patients with limb loss. By integrating real-time neural data with high temporal and spatial resolution, we enhance responsiveness while ensuring user comfort. Machine learning models decode cortical and peripheral signals with high accuracy and low latency, correlating nerve pathway activity with cortical signals for precise control We expect our system to accurately detect and interpret motor intentions from cortical activity and correlate these signals with peripheral nerve activity, bridging the gap between the brain and external devices through high-density electrodes and machine learning. This could lead to more intuitive control of neuroprosthetics and enhance rehabilitation strategies for individuals with neuromuscular impairments. Future research will focus on integrating sensory feedback for bidirectional communication, adapting the system across conditions like stroke rehabilitation or spinal cord injury recovery, incorporating multimodal BCIs, and integration in clinical and quotidian environments.

University of South Florida

Are Black Holes Actually at Their Maximum Spins?

Holly Zeyl

Dr. Jeremiah Murphy

Black holes are the most compact objects in the Universe, representing extremes in the gravitational warping of space-time and in the formation of compact objects. As such, studying their properties offers strong tests of gravity as well as black hole formation. The spin of a black hole is a particularly interesting quantity, and it has significant implications for the formation history of the black hole. Contemporary measurements give the spins of most black holes as very close to the maximum spin value, despite a lack of theory justifying this trend. We identify an assumption central to the primary methods of spin determination that may be biasing the measured spins. In short, the matter swirling around the black hole, known as the accretion disk, has an inner boundary which may be much closer to the black hole than is typically assumed. In order to assess the validity of this assumption, we model the conditions in a typical accretion disk to evaluate the detectability of the inner edge of the disk. This analysis will advance our knowledge regardless of the exact result; the results will either reinforce or refute the crucial standard assumptions used in inferring the spins of black holes. Each of these cases comes with unique implications about the formation of black holes.

Florida State University

Comparative Analysis of Vascular-Organs-on-Chip Technology to Standard Treatments of Vascular Conditions

Ian Broadman & Kristy Tran

Olukemi Akintewe

Organ-on-a-chip (OoC) technology has the potential to address the limitations of animal and 2D in-vitro modeling by creating a complex simulation of body system functions by growing cells in a dynamic fluid environment. Unlike standard 2D in-vitro modeling, OoC microfluidics simulate the biochemical environment using microchannels for precise fluid control within OoC devices, while also minimizing deformation of the vascular wall, and regulating fluid dynamics. The aim of this systematic review is to conduct a comparative analysis of Vascular Organs-on-a-Chip (VOoC) technology to the current standard treatments of heart conditions and diseases. Our methodology consists of a comprehensive literature review evaluating VOoC technology compared to standard methods based on efficacy, scalability, and potential for personalized treatments using electronic databases such as PubMed and ScienceDirect. VOoC technologies hold significant potential for advancing personalized medicine, drug discovery, and disease modeling. However, they encounter challenges like organ functionality replication, standardization, and scalability. Addressing ethical concerns requires collaboration among scientists and policymakers. Such partnerships are crucial for addressing issues related to materials, data management, and building public trust. In essence, OoC technology for the vascular system provides a highly specialized alternative to current standard treatments. With this technology, researchers can better simulate the intricacies of the vascular system and provide the opportunity to further study the cellular interactions within these systems.

University of South Florida

Nuclear Membrane Rupture as a Cell Killing Mechanism for Paclitaxel and Carboplatin in Lung Cancer Cells

Ibrahim Nasim

Mike Xu

Background & Significance

Lung cancer, including small cell and non-small cell types, is the leading cause of cancer death in the US, accounting for ~20% of all cancer deaths. Paclitaxel (PTX), a chemotherapeutic agent, halts cancer growth by stiffening microtubules, inducing mitotic arrest and cell death. Carboplatin (CP), a platinum-based agent, damages oncolytic DNA directly. The exact mechanisms by which PTX and CP induce cell death remain under investigation. This study explores whether these agents, in combination, cause nuclear envelope rupture, leading to cell leakage and death.

Objectives & Approach

We used the NCIH1650 cell line, derived from a stage 3B bronchoalveolar carcinoma (BAC) patient, a subtype of non-small cell lung cancer prone to rapid tumor development. We hypothesize that PTX and CP synergistically induce micronucleation, nuclear rupture, and reduced proliferation. NCIH1650 cells were grouped into Control, PTX, CP, and Combination and analyzed via immunofluorescent staining and WST assay. Sonicated cells were measured at 4, 24, and 48 hours.

Outcomes & Future Directions

Combined treatments reduced cell counts by 60% over five days and by 70% when combined with sonication at 24 hours. Immunofluorescence revealed nuclear rupture sites and laminopathy, affecting ~60% of nuclei in treated cells. These findings suggest enhanced chemotherapy efficacy with ultrasound as a minimally invasive approach. Further in vitro and in vivo studies are needed to explore translational potential in clinical settings.

University of Central Florida

Socioeconomic Drivers of Crime in France: Analyzing the Relationship Between Immigration, Poverty, and Criminality

Imadeddine Zmarou

Ransford Edwards

This study examines the relationship between immigration and crime in France, using departmental data from 2021. Amid rising political tensions and far-right claims linking immigration to insecurity, the research investigates whether these assertions hold statistical merit. Regression analyses assess the impact of immigrant population percentages on homicide and sexual assault rates, controlling for factors such as poverty and population density. The analysis finds no significant link between immigration and homicide rates. Instead, poverty emerges as a major determinant, with departments experiencing higher poverty levels reporting significantly more homicides. Conversely, areas with higher immigrant populations report fewer sexual assaults, a trend that strengthens when socioeconomic factors are accounted for. These findings counter narratives associating immigration with increased crime, highlighting poverty and inequality as key drivers of violent crime. The study advocates addressing structural disparities as part of crime reduction strategies, redirecting focus from immigration. Future research should investigate variables like education and unemployment to deepen insights into these dynamics.

Nova Southeastern University

Potential Causes for the Early Onset of Colorectal Cancer (EOCRC)

Irfan Mahadi Sharif & Stuti Dibbur

Stuart R Maudsley

Colorectal cancer (CRC) arises in the digestive system, specifically the colon and rectum. Trends in CRC have become prevalent in individuals under the age of 50, this early form is referred to as Early-onset Colorectal cancer (EOCRC). As the third leading variant of cancer, associated risks include excessive exposure to antibiotics, drinking and smoking, western diets, and sedentary habits, which result in alterations to the gut microbiota; these alterations lead to inflammation and subsequent development of EOCRC. Genetic syndromes including Lynch syndrome, familial adenomatous polyposis (FAP), and MUTYH-associated polyposis (MAP), are also associated with increased EOCRC risk. These disorders are associated with genetic mutations that disrupt normal DNA repair, which significantly raises the risk for development of EOCRC. To reduce the healthcare impacts of EOCRC, early screening advocacy has focused its efforts on providing individuals with genetic risk factors with easier accessibility for screening. For individuals diagnosed with EOCRC, traditional methods of surgery, chemotherapy, immunotherapy, and radiation are common; however, these conventional methods often have lasting side effects and do not prevent late-onset colorectal cancer (LOCRC). Targeted therapies have not evolved to identify and block cancer-promoting signaling systems for EOCRC. Regardless, technological developments have increased the future prospects of treatment for EOCRC; clinical trials building upon nanotechnology and advancements in DNA and RNA identification are instrumental in creating effective targeted therapies.

University of South Florida

Baroque Influence in the Structure of the Venezuelan Piece 'Suite Para Cuerdas: Fuga Con Pajarillo'

Irsia Ruíz Guzmán

Dr. Shannon Lockwood

Venezuelan composer Aldemaro Romero has over 100 published works deeply rooted in the vernacular traditions of Venezuela, presented through Western musical forms and techniques. This study explores the ways in which Romero utilized conventional classical forms, structures, and compositional techniques from the Baroque period and combined them with native Venezuelan rhythmic and harmonic progressions in the work: 'Suite para Cuerdas: Fuga con Pajarillo.' Using fugal techniques, polyphonic textures, counterpoint, extended techniques, and improvisatory style, Romero seamlessly merges the rhythm of the traditional Venezuelan dance 'Joropo' with Baroque forms and structures, such as the orchestral suite. An example is how Romero utilizes improvisation, a

key element of music from the Baroque period and Venezuelan music. Romero also blends the rhythm of the Pajarillo, a subgenre of Joropo in a minor key, with a complex 5-voice fugue through the use of imitation and repetition. The hybridization process in this piece is unique, as is the way Romero successfully fuses Western forms with Venezuelan popular music.

Jacksonville University

Feeding biomechanics and native and invasive fish species in the Florida Everglades

Isabel K. Knuteson & Grace Magnacca

Dr. Daniel Huber

Everglades conservation is critical to both the well-being of Everglades biodiversity and the communities surrounding this unique ecosystem. The management of water resources, agriculture impacts, and invasive species all affect the viability of the Everglades. The success of invasive species can often be attributed to their ability to outcompete the native species in their niches. To investigate the success of invasive cichlid fishes in the Everglades and their ecological impact on native centrarchid fishes, bite force and suction pressure were investigated over ontogeny using biomechanical modeling. Invasive Mayan cichlids Mayaheros urophthalmus (14 - 29 cm TL) had an oral jaw mechanical advantage of 0.36, bite force of 5.3 N, epaxial mechanical advantage of 0.24, and suction pressure of 1.9 kPa. Invasive Nile tilapia Oreochromis niloticus (12 - 26 cm TL) had an oral jaw mechanical advantage of 0.42, bite force of 1.6 N, epaxial mechanical advantage of 0.19, and suction pressure of 0.9 kPa. Native bluegill sunfish Lepomis macrochirus (10 - 15 cm TL) had an oral jaw mechanical advantage of 0.37, bite force of 0.7 N, epaxial mechanical advantage of 0.31, and suction pressure of 2.7 kPa. Preliminary analyses suggest that bluegill have lower bite forces but higher suction pressures, suggesting that any extent to which the bluegill is being outcompeted by these invasive cichlids may not be attributable to deficits in feeding performance. Future analyses will examine scaling patterns of feeding biomechanics and add sampling of additional native redear sunfish Lepomis microlophus and spotted sunfish Lepomis punctatus.

University of Tampa

Shifting Influences: Social Media and Substance Use Perceptions Among College Students

Isabel Santos de Oliveira

Dr. Kathleen Moore

Substance use is a significant health concern among college students, contributing to several negative outcomes such as poor academic performance, low graduation rates and unemployment. Understanding student's perceptions of harm and the role of social influences when it comes to substance use is essential to designing effective interventions. This study examined how college undergraduate students and recent graduates (N=141) perceive the harms of marijuana (edible and smokeable) and nicotine e-cigarettes ("vapes"), focusing on the impact of peer pressure and social media, with support from the Hillsborough County Anti-Drug Alliance (HCADA). Participants completed an online Qualtrics survey, and chi-square and frequency analyses were used to explore relationships between substance use, harm perception, and peer/social media influences. Findings showed that while students reported using both substances at similar rates, they perceived nicotine e-cigarettes as significantly more harmful than marijuana, while many considered marijuana as harmless. Interestingly, traditional peer pressure did not play a significant role in students' substance use decisions, while social media might have acted as a novel form of peer pressure. These findings highlight the influence of social media on substance use perceptions and behaviors among college students and raise the need for adopting interventions for substance use through social media. Future research should explore social media influence as the "new peer pressure" and investigate the effectiveness of social media campaigns in reducing substance use among college students, with focus on how social media influencers shape students' decisions regarding substance use.

University of South Florida

Expanding the Application Space within Polyverif and Integrating Neuroevolution

Isabella Acosta & Hannah Ramsden

Dr. M. I. Akbas

Polyverif is a powerful tool used for autonomous vehicle simulation testing. It tests the validation and verification of these autonomous vehicles

during multiple traffic scenarios by adding different parameters that can test a multitude of elements. It has been used by multiple researchers, developers, and engineers to further expand the possibilities within this realm. It only dates to 2021, making it a rather new application on the market, so the application space is limited. The goal of this project is to expand the testing space within Polyverif by adding new testing simulations using the ERAU DB campus as a testing ground. This campus provides a unique set of traffic laws, traffic patterns, and object identification. By using this campus, different patterns and dynamics of the intersections can be studied and how they can apply to Polyverif's simulation space. By understanding these dynamics and patterns, it can pave the way for the integration of machine learning, which would be the next goal for this project. The team would aim to integrate evolutionary intelligence models and by using these models, it would improve the accuracy of the validation and verification of the current systems and the future systems to come.

Embry-Riddle Aeronautical University

Security Public Schools: A Comprehensive Review of Scalable School Safety Strategies Through Statistical Analysis of Security Mechanisms

Isabella Ensign

Dr. Hans Hassell

School security strategies, such as School Resource Officers (SROs), metal detectors, and access control systems, have been extensively studied in the wake of school shootings. Existing research often highlights localized or tailored implementation without addressing the economic and legislative challenges of federal adoption in public schools. This article addresses a gap in school security research by running an independent t-test on two samples—a group of public school shootings dating from January 1, 1999, to December 31, 2023, and a group of randomly chosen public high schools. The preliminary research prior to conducting the t-test assesses a range of security mechanisms, including infrastructure modifications, technological systems, threat detection processes, and human factors. After conducting the t-test and analysis, the findings propose a set of adaptable recommendations that balance security needs with resource constraints. The findings of this study aim to inform policy on scalable school safety

mechanisms and protocols, ultimately contributing to a federal strategy for enhancing school security in an efficient manner.

Florida State University

The Influence of Pre-Pregnancy Obesity on Dietary Consumption of Sugar-Sweetened Beverages and Processed Meats on Infant Birth Weight

Isabella Guenzler & Zara Haruna

Dr. Dominick Lemas

Maternal obesity and high infant birth weight are significant public health concerns. Frequent consumption of processed foods during pregnancy has been linked to excessive gestational weight gain. However, the influence of pre-pregnancy obesity on dietary patterns and infant birth weight remains poorly understood. This study aimed to evaluate the association between pre-pregnancy obesity and dietary intake of SSBs during the third trimester, as well as the impact of pre-pregnancy obesity on infant birth weight. Participants were recruited from the Breastfeeding and Early Child Health Study, which followed individuals from the third trimester through the first postpartum year. Participants included mothers without obesity ($n=46$; BMI <25.0 kg/m^2) and mothers with obesity ($n=37$; BMI <30.0 kg/m^2). Three-day dietary records during the third trimester were analyzed using ESHA Food Processor software to quantify nutrient intake. Maternal and infant anthropometric data were collected during the third trimester, two-weeks, two months, and one-year postpartum. Differences in outcomes were tested using the Wilcoxon Rank-Sum Test in R Studio. Mothers with obesity consumed more SSBs on average than mothers without obesity (82.9 g/day vs. 57.7 g/day) ($p = 0.4123$). Obese participants consumed more processed meat than non-obese participants (53.3 g/day vs. 37.5 g/day) ($p = 0.3502$). Infants born to mothers with obesity weighed more on average than those born to mothers without obesity (3.59 kg vs. 3.37 kg) ($p = 0.0930$). However, none of these results were statistically significant. While trends suggest potential differences, further analyses, including effect size calculations, are needed to better quantify these relationships.

University of Florida

The Role of Bimanual Coordination in Music Learning

Isabella Ramsaroep

Dr. Jennifer Bugos

Music training programs can increase bimanual coordination skills across adulthood; however, little is known about how bimanual coordination skills change as a function of participation in a music intervention (Bugos, 2019). Motor coordination has been associated with cognitive performance in aging, improving bimanual coordination may

positively affect cognitive and motor outcomes (Roman-Liu & Mockałło, 2020). In addition, researchers have found that coordinated activities such as music training may develop executive and motor functions; however, the benefits found are dependent upon coordination demands of the intervention (Bugos, 2019). Our research examined the effects of different music interventions (fine motor as compared to gross motor) on cognitive and motor outcomes in healthy younger (18-25) and older (60-90) adults. Participants (N=120) were randomly assigned to one of the music interventions (piano, percussion). All participants completed a series of standardized motor and cognitive measures every four weeks over a 12-week period. All participants completed a 90-minute training session twice per week for 12-weeks (24 sessions). Findings on bimanual coordination measures showed that older adults had more rhythmic errors compared to younger adults across all time points. Younger adults outperformed older adults across all four time points in all three categories: rhythm, pattern, and synchronization. However, no differences were found among younger and older adults for pattern and synchronization. Data are consistent with research suggesting that rhythmic errors are more prominent in aging adults when compared to younger adults. Additional rhythmic training programs may serve as model music education programs for aging adults.

University of South Florida

Stress Relaxation Dynamics and Rheological Behavior of Silk Fibroin Hydrogels

Isabelle Gerzenshtein

Dr. Whitney Stoppel

Silk fibroin hydrogels are highly promising for tissue engineering and regenerative medicine due to their biocompatibility and tunable viscoelastic properties.1-5 However, the brittleness and loss of transparency often observed in physically crosslinked hydrogels, particularly those with high crystalline content, pose significant challenges to their application in mimicking soft tissue.5, 6 This work investigates the shear rheological behaviors of both physically crosslinked hydrogels and covalently crosslinked hydrogels,2, 7 focusing on the results from stress relaxation tests under 10%-strain to evaluate time-dependent stress decay. We assess whether gels formed through photocrosslinking methods following silk fibroin chemical modification can retain beneficial elastomeric properties over 2 weeks. It has been observed that in chemically crosslinked systems, the elastic character diminishes over time as physically crosslinking overwhelms the initial network structure.5, 6 However, use of viscoelastic materials, instead of purely elastic, can impact cell differentiation and mobility.8, 9 Therefore, we hypothesize that tuning the crosslinking methods in silk fibroin hydrogels can alter the rate of physical crosslinking. Understanding the dynamics of this process will enable a greater understating of how hydrogels transition from a highly elastic material to a brittle material that plastically deforms. To understand the transient nature of silk hydrogel systems, we quantified the influence of silk fibroin's molecular weight and the crosslinking method (physically crosslinked, enzyme mediated dityrosine crosslinking, or LAP mediated photocrosslinking) on rheological properties of these hydrogels over 2 weeks. Through these investigations, we aim to enhance silk hydrogel formulations for tailored biomedical applications, including advancing models5 for disease progression.

University of Florida

Two-way communication system - AMERICAN SIGN LANGUAGE to ENGLISH using AR Glasses

Jack Leser & Trevor Chessnoe

Md Baharul Islam

The accessibility gap in communication between American Sign Language (ASL) users and natural language speakers presents a significant challenge to fostering inclusive interactions in various domains. Our project seeks to address this barrier by leveraging Augmented Reality (AR) and artificial intelligence (AI) to develop an automatic ASL translation system. By integrating computer vision, natural language processing, and AR technologies, we aim to create a platform that can translate ASL gestures into natural language text or speech and vice versa. Our work-in-progress focuses on designing deep learning models capable of recognizing ASL gestures, including subtle hand movements and facial expressions critical to linguistic context. These models are embedded within an AR interface that overlays translations directly into the user's environment, providing an intuitive and accessible communication tool.

Preliminary results from system design and pilot testing highlight the potential of this approach in bridging the communication gap while empowering ASL users in diverse settings. This presentation will outline our project's methodology, prototype development, and early findings, along with challenges such as dataset diversity, model optimization, and interface usability. We will also

discuss future steps for refining the system and expanding its capabilities. This project represents an ongoing effort by undergraduate researchers to contribute toward a more inclusive, technology-driven solution for the deaf and hard-of-hearing community.

Florida Gulf Coast University

Literary visions of Postmodernity in the Post-Colonial in Jünger and Guyotat

Jackson Griffis

Jeffrey Smith

As colonial exit began in Africa and Asia, many contemporary authors used the metaphorical space of Post-Colonialism to explore Postmodern themes through their fiction. For Ernst Jünger and Pierre Guyotat, the regions of North Africa and South Asia, particularly Morocco and Vietnam, presented ripe ground for exploration of the abolition of history, language, and the rules of engagement in the Post-Geneva Convention world. This article argues that the texts of Eumeswil and Tomb for 500,000 Soldiers utilize Post-Colonial spaces as a lens through which to view and apply these concepts within a fictional space, while also examining the historical and literary context that lead Guyotat and Jünger to focus their authorial gaze upon North Africa and South Asia.

University of North Florida

Navigating Justice: Gender Perspectives on AI's Role in Court

Jacobo Fabregas Navas

Dr. Monica Escaleras

Many have stood by the judicial system and many have criticized it. These opposing perspectives have raised the question of whether people really believe if the judicial system is fair? This question of fairness has led many to wonder if A.I could perhaps have a role in some processes within the judicial system. In order to answer these questions, I wrote a 16 question survey and distributed using Amazon Mechanical Turk to individuals 18 and over across the United States. Specifically, I wanted to test two hypotheses. First, is there a statistically significant difference between gender and the views of fairness of the Judicial System; and second, is there statistically significant differences on the incorporation of A.I into the Judicial System. I used IBM SPSS to analyze the data and found that there is a statistically significant difference between gender and the views of fairness, with 19% of males indicating that the judicial system is very fair whereas only 4.8% of women believe the system is very fair. Additionally, 87% of respondents believe AI should be incorporated into the judicial system, with no significant difference between males (89%) and females (87%). In conclusion, my research shows that people are open to AI in the judicial system, paving the way for future studies on how it could be implemented.

Florida Atlantic University

Surveying the Scroll: A Mixed-Methods Study of College Students' TikTok Privacy Literacy

Jad Dargam

Sein Oh

TikTok continues to be one of the most popular social media platforms amongst college students, even as policymakers and industry experts continue to highlight privacy concerns with how it collects, stores, and uses user data. This includes a total ban of the platform from public universities in the state of Florida. As the platform engrains itself into daily life for most college students, it is important to assess how undergraduate students comprehend and manage privacy features, approve of university policy regarding TikTok and how their actions are influenced by familial and social beliefs.

This study aims to do so by using a mixed-methods approach that incorporates a quantitative survey and qualitative interviews. Questions will measure students' usage of TikTok, their own privacy concerns, and behaviors on the platform. This data will be examined in the context of social and cultural norms that the participants provide in order to better understand how user experience is shaped on experience and knowledge.

The findings of this study will help researchers better understand how college students dictate their actions on TikTok through the perceived value of their privacy and data. It will also evaluate the effectiveness of institutional polices that aim to block TikTok. A preliminary study conducted by the principal investigator has shown limited change in college students' behavior and beliefs through prohibiting TikTok usage on campus. The final study will add to the conversation regarding how humans interact with technology that has the potential to expose personal information and create safety concerns.

Florida State University

Understanding Honors Students' Perspectives on ChatGPT in their Academic Activities

Jada Lessen

Dr. Sanghoon Park

Universities around the world are increasingly aware of the use of generative AI chatbots towards academic coursework. Educator perspectives research has shown both disapproval and excitement surrounding the potential of chatbots like ChatGPT being utilized in higher level education, with a prevalent concern for academic integrity. This qualitative study aimed to explore university honors student perspectives to answer concerns in the literature and to gather insights on how ChatGPT can be useful in academics. After conducting literature review on student perspectives and ChatGPT, interviews were conducted with University of South Florida honors students regarding their ChatGPT use. An extended Technology Acceptance Model to include subjective norms guided the study and served as a foundation for the coding process, supplying the major and minor themes for an inductive template analysis. Participant responses revealed that honors students find ChatGPT useful for numerous academic activities, easy to use despite some prompting issues, and are more inclined to use ChatGPT than university resources. ChatGPT is commonly found useful within academics as a brainstorming tool, a search engine, and for evaluating projects based on rubrics. In both situations of professor support or professor disinclination, honors students are motivated to continue using ChatGPT towards academics. Despite ChatGPT utilization, professor relevancy to honors students prevails due to professors being perceived as masters of their field with real-world experience. Based on these findings, university policy that aims to integrate or allow the use of ChatGPT should revisit policy language to consider the elements of the Technology Acceptance Model.

University of South Florida

Investigation on MicroRNAs for Canine Congestive Heart Failure

Jada Prignano

Amy Bohan

Myxomatous mitral valvular degeneration (MMVD) is the most common heart disease in dogs, and is characterized by valvular thickening and regurgitation, leading to secondary changes in cardiac structures and function. The prevalence of the disease has been correlated with the age and the breed. Small breed dogs, such as the Cavalier King Charles spaniel (CVKC), are predisposed to the disease and the disease prevalence in the CVKC dogs older than 10 years is greater than 90%. Given that the disease is common, but only a minority of dogs will progress to heart failure, it would be useful if there were a way in which those animals at greatest risk of experiencing progressive disease could be easily distinguished. With the identification of a high-risk subpopulation, subsequent monitoring and therapy could be more effectively targeted towards those patients at greatest risk. Early signs of decompensation could be identified, and treatment could be introduced from the earliest stage at which it is known to be effective.

New College of Florida

Exploring Anxiety and Academic Motivation In Students Enrolled In Chemistry Courses

Jaden Salameh

Christopher Randles

Anxiety and mental health of college STEM students is a growing concern, particularly post-pandemic. Of the 2,500 students who responded to the Student Mental Health Landscape survey, 80% of students reported emotional struggles, with many dealing with anxiety (59%), burnout (58%) and depression (43%). Furthermore, students perceive that a majority of students will experience more burnout (79%), and increased mental illness (72%) over the next 5 years. Our study sought to better understand student mental health in chemistry by investigating the interplay between anxiety, perfectionism, and academic motivations among students enrolled in organic, physical, and general chemistry courses at a research-intensive university in the southeast region of the United States.
The study employed a survey methodology to collect data from participants, focusing on critical dimensions of anxiety and perfectionism related to academic performance. The survey assessed extrinsic and intrinsic goal orientation, task value, learning beliefs, self-efficacy, test anxiety and perfectionism. Responses to the survey questions were measured on a 1 to 7 Likert scale. Preliminary analyses suggest a complex relationship between anxiety levels and perfectionistic tendencies, with implications for academic performance and student well-being. This research contributes to a deeper understanding of how these psychological factors influence learning outcomes and student learning in rigorous academic environments such as chemistry courses and highlights the need for strategies to support students in managing

and regulating their anxiety and fostering greater intrinsic motivation.

University of Central Florida

Effects of Finasteride on Cell Regeneration Using Planaria as a Model System

Jahann M Hannor

Alba Chavez

Aerospace physiology observes Cell reproduction within humans and how different substances and different environments can affect cell reproduction among all species. The species that is being observed is known as planaria from the class known as turbellaria, the planarian is an excellent model system. Planaria has been used within the microbiology community to observe the regenerative properties they possess and how different environmental factors affect the rate of regeneration. In previous research, we have observed that microgravity and ultraviolet light significantly impair planaria regeneration. In the present study we aim to study the effect of Finasteride in cell regeneration. Finasteride is a substance used within the medical community to treat male pattern baldness; however, there are detrimental factors that can be present, including cell toxicity. We have tested two different trials with two different concentrations of finasteride, while still observing planaria under regular environmental conditions. This was done to compare life expectancy and the rate of regeneration. Finasteride caused cell death at high doses and decreased regeneration rates at low medical doses. The combined strategies for cell regeneration and study of drug toxicity have now been implemented in a classroom setting to demonstrate and practice the scientific method using a fascinating model system.

Embry-Riddle Aeronautical University

Modeling Stellar Isochrones during the Evolution of Young Star Clusters

James Egdorf

Tomasz Plewa

To better understand star clusters, the measurement of isochrones, curves on the Hertzsprung-Russel (HR) diagram that contribute to different star populations, are produced from a library of stars at varying masses. These stars are then randomized to vary in age, metallicity, and rotation, allowing for the diagram to be compared to observational data. From here, theoretical models can be added to existing initial mass function (IMF) studies to clarify aspects of stellar evolution to help bridge the data. In astrophysics, the IMF describes the distribution of stellar masses at the stars' birth. Particularly for computational models, this enables the creation of stars of different masses. One limitation of calibrating the function is the composition of molecular gas, which comes from clusters of stars with a similar timeframe all the stars were born. There are not enough known clusters that fit more specific requirements, leading to a gap in stellar evolution research. To run the simulation, the Modules for Experiments in Stellar Astrophysics (MESA) is a modeling tool for single and binary stars based on various masses by changing the initial conditions to create a library of stellar models with different masses, and these stars will be randomized to vary with secondary parameters. After getting the data of the cluster, the HR diagram will allow the calculation of stellar isochrones, where the data of the artificial star cluster can then be compared against HR diagrams of observational data to estimate age and the secondary parameters of the stellar population.

Florida State University

Slaves, Hillbillies, and Fine Young Ladies: The Banjo's Transition Into and Out Of Mainstream Society

Jane Cohen

Peregrin Shaeffer

Today, those who play the banjo are typically assumed to be white Americans from the rural South. Despite this popular image, the banjo was first created by African slaves in the Americas during the early 1700s, and was culturally associated with Black Americans until well after the Civil War. In both of these contexts, contemporary and historical, banjo players are portrayed in a very similar way, as poor, rural, and unsophisticated. However, from about 1880 to 1900, there was a major shift in these perceptions. In this period, known as the Classic Banjo era, the banjo was instead considered a fashionable instrument in white upper and middle-class urban society in the United States. Although a growing body of research exists regarding the African origins of the banjo, the Classic Banjo era remains understudied. Using relevant advertisements, method books, and newspaper and magazine articles published between 1880 and 1900, this project analyzes attempts to elevate the banjo's status in society, and the effects of those endeavors. This study finds that the banjo's rise in status was not accidental, and was largely the result of

a successful advertising campaign undertaken by instrument manufacturers. The banjo's new identity was well known in upper class society during this time, but it failed to permeate deeply into the culture, remaining a novelty fad that would quickly disappear. Today, the Classic Banjo serves as an example of cultural appropriation, and demonstrates how our perceptions of culture have been, and continue to be shaped by, the media.

Florida State University

PhotoVOICE: Revealing and Amplifying Faculty and Student Voices for Equity in STEM

Janet Provitera & Erika Tarongoy

Starlette Sinclair

The powerful research initiative of "PhotoVOICE" (Voicing our Individual and Collective Experiences) has existed for around 30 years, with its unique method enabling community participation through shared photos and videos to gather an accurate view of social issues and encourage collective action (Wang & Burris, 1997). Along with these principles, Wang & Burris drew the concept of photovoice from feminist theory to encourage female leading voices, since participatory action research such as this has often been led by male bias (1997). For this reason, National Science Foundation (NSF) ADVANCE's Project RAISE applied photovoice to the educational context of Florida Gulf Coast University (FGCU), where female faculty in STEM continue to be underrepresented. Project RAISE utilized photovoice as an activity to increase visibility of women in STEM, amplifying their issues to become addressed directly by the institution. This activity was also implemented at a crucial period, since the intersection of multiple hurricanes affecting Southwest Florida in recent years brought respective challenges to the lives of both female faculty and students in STEM alike. This presentation will detail how Project RAISE accurately designed and implemented photovoice, considering modern methods such as the internet for dissemination to a faculty and student body (CohenMiller & Isekenova, 2022). Furthermore, Project RAISE's objectives will be discussed on how they aim to create a large-scale impact from photovoice by establishing its data in university spaces for all to view. Insights will be shared on the benefit of institutions to implement photovoice in assessing educational and institutional inequities.

Florida Gulf Coast University

The Arm-Leg Interactive Coupling Exosuit (ALICE): A Medical Device Transforming Gait Rehabilitation

Jannah Barakat & Giovanni Padron-Calero

Joon-hyuk Park

Walking requires precise coordination between the upper and lower limbs, controlled by the central nervous system (CNS). While traditional gait assistive devices focus on lower limb support, they often neglect the potential of upper limb movements to enhance walking efficiency. The Arm-Leg Interactive Coupling Exosuit (ALICE), developed in the Wearable Biomedical Engineering and Assistive Robotics Lab, addresses this gap by mechanically linking the arms and legs through a system of cables and pulleys. ALICE transforms natural arm swing into assistance for lower limb movement, reducing muscle effort and energy expenditure. In this study, 15 healthy adults participated in treadmill trials under three conditions: baseline, exosuit disengaged, and exosuit engaged. Walking biomechanics, muscle activity, and metabolic cost were measured. When engaged, ALICE significantly reduced lower limb muscle activation and energy expenditure, with a slight increase in upper limb contribution. These findings highlight ALICE's potential to enhance walking efficiency and its promise as a rehabilitation technology for individuals with impaired gait function.

University of Central Florida

Afrocentric Empowerment & Storytelling in Hip Hop: Amplifying Marginalized Voices in Little Simz's Album No Thank You

Jaquoi Dorsett &

Dr. Armin Langer

Little Simz, a Nigerian-UK rapper, is celebrated for her innovative contributions to British hip hop, intertwining African storytelling with societal commentary. Born Simbiatu Ajikawo, her music transcends entertainment, delving into themes of identity and empowerment. Drawing from her cultural heritage and second-generation immigrant status, she crafts narratives reflecting on womanhood and Blackness in contemporary Britain. Central to her artistry is her exploration of empowerment and resilience, amplifying the voices of marginalized communities and people of African descent in the UK. Her critically acclaimed 2022 album No Thank You showcases her storytelling

know-how, blending introspection with social commentary. By situating her work within African storytelling traditions, particularly the West African tradition of griot, this study explores how Little Simz merges historical inspirations with modern realities. Through a feminist and Afrocentric lens, her music becomes a vehicle for cultural identity and envisioning hopeful futures. The poster argues that Little Simz's music contributes to discussing womanhood and Blackness in Britain and beyond. Our approach was a content analysis of No Thank You, using four songs by Little Simz, followed by a literature review of academic publications on Nigerians in the UK, race/racism in the UK, hip hop, and race. Through her bold lyricism, we conclude that she challenges narratives and reshapes the hip hop landscape, emphasizing the importance of diverse voices within the African diaspora.

University of Florida

Exploring Silicon as a Viable Alternative to Carbon in the Formation of Extraterrestrial Life

Jasmine Francois

Dr. Joseph McNeil

Silicon, the eighth most abundant element in the universe, shares many chemical properties with carbon, the primary building block of organic life. While life on Earth is based on carbon-based organic compounds, this study explores the potential of silicon as a substitute in the formation of life. Silicon is primarily produced during the oxygen-burning phase of Type Ia supernovae, whereas carbon is synthesized in stars through the CNO cycle and the triple-alpha process. Both elements possess four unpaired valence electrons, enabling similar chemical bonding structures. Given these parallels, it is conceivable that silicon-based organic molecules could undergo a biosynthesis process analogous to carbon-based chemosynthesis, which involves hydrogen, carbon, oxygen, and nitrogen. This research examines why silicon may be the most promising alternative to carbon among these essential elements, particularly under the extreme conditions likely to be found on certain exoplanets.

Tallahassee State College

Empowering Marginalized Youth Through Sports: Developing Marketing and Brand Strategies for Community-Based Athletic Programs and Media Engagement

Jasmine Grant Sutton

Ruosi Shao

While they promote social resilience, lower recidivism, and promote personal growth, community-based sports programs have the power to change the lives of marginalized youth. Despite these advantages, a lot of these initiatives have trouble obtaining funding, recognition, and ongoing community support. This study looks into the best ways to sell these programs to increase their impact using brand building and strategic marketing, which are based on popular sports networks like ESPN. The study looks at audience engagement tactics, digital storytelling approaches, and branding strategies employed by top sports media in order to solve this. Key components that support the successful promotion and long-term viability of youth sports programs are identified through qualitative case studies and interviews with program organizers, marketing experts, and participants. According to preliminary research, sports programs can greatly increase their reach and efficacy by utilizing digital media, establishing alliances with nearby companies, and developing narratives that emphasize their social benefit. By showing how community-based sports programs may be expanded and maintained to help marginalized communities, this study emphasizes the value of marketing as a vehicle for advocacy and empowerment. The findings aim to inform future policy decisions and inspire similar efforts that integrate marketing innovation with social justice goals.

The study offers a number of ramifications and potential research directions that could have significant effects on sports marketing, youth empowerment, and community development. The media's role in youth development, the social impact of sports marketing, and the development of economic and policy are only a few of the implications. Investigating issues like: How can strategic marketing and brand development, inspired by successful sports networks like ESPN, be leveraged to create and promote community-based athletic programs that empower margenalized youth and foster positive social outcomes? can allow for more research on the

Florida State University

Water Quality and Anatomy of Selected Plant Species Growing at Tomoka State Park and Riverbend Nature Park, Volusia County

JDeja Evans & Mackenzi Thompson

Anna B. Ponce

Coastal freshwater habitats are increasingly affected by anthropogenic pollutants and salinity changes. This study investigates water quality differences between an urbanized site (Ormond Oaks) and a preserved site (Tomoka State Park) along the Halifax/Tomoka River and its impact on the anatomy of selected aquatic or shoreline plants. Preliminary results suggest higher salinity levels in Tomoka State Park.

Water quality parameters will be assessed at the two sites, and three to five plant species growing at both sites (five specimens per species, per site) will be collected. Collected samples will be fixed, dehydrated (ethanol), embedded (paraffin), sectioned, stained (PAS), and mounted. Vascular bundle diameter and density, epidermis and cuticle thickness, and vessel element diameter will be measured.

The results will enhance the understanding of how varying water quality impacts plant development. Identifying sensitive species as bioindicators and tolerant species for restoration is crucial for effective ecosystem management planning.

Bethune-Cookman University

Correlating Trait Disinhibition and Stimulus-Locked Event-Related Potentials in the Go/no-go Context

Jeffrey "Zach" Helms

Dr. Christopher Patrick & Alex Kallen

Disinhibition, a commonly examined trait, is largely characterized as one's inability to resist or change impulses. The impacts of high disinhibition on behavior often lead to problems in an early age (e.g., combative relationships, disciplinary action in school) and into adulthood (e.g., driving under the influence, financial hardship). Across the last few decades, research attempting to understand the neural basis of disinhibition has been conducted. This study extends research on the neural correlates of disinhibition, focusing on N2 and P3 event-related potential (ERP) amplitudes within the go/no-go task context. Using the go/no-go task context, an attempt was made to identify the underlying influence of disinhibition on N2 and P3 ERPs. Data was drawn from a sample of (n= 90) undergraduate and community participants, with oversampling for psychopathic traits. The go/no-go task measured cued responses to target "go" stimuli in the presence of denied dominant prepotent response ("no-go"). Disinhibition was assessed via the Externalizing Spectrum Inventory-Brief Form (ESI-BF). EEG data, collected using a 128-electrode system, were preprocessed for artifact correction and baseline normalization, with N2 and P3 amplitudes extracted from task-relevant conditions. Pearson correlations were used to analyze the relationships between ERP components and disinhibition scores. This study uniquely employs a go/no-go paradigm to investigate inhibitory processes and neural responses to conflict, offering insights into disinhibition's neurophysiological underpinnings. Results aim to clarify discrepancies in prior N2/P3 research and inform broader applications of ERP measures in psychopathology.

Florida State University

The Role of MEK Signaling in Drosophila melanogaster Dorsal Patterning

Jeiselli Archer & Abraham Hernandez

Laura Serbus

Drosophila melanogaster, known as the common fruit fly, serves as a model organism for numerous human diseases due to the conserved pathways they share with humans, such as the Receptor Tyrosine Kinase (RTK)/RAS pathway. In this pathway, a ligand binds to the RTK, activating Ras proteins which activate downstream protein kinases through a phosphorylation cascade. One vital protein in the cascade is MEK, which is downstream of Ras and activates Extracellular Signal-Related Kinase (ERK). ERK is the last kinase protein in the pathway that phosphorylates transcription factors, leading to changes in gene expression. This pathway is important for patterning in early Drosophila development. Developing oocytes release Gurken, a ligand that binds to an epidermal growth factor receptor, an RTK receptor on nearby follicle cells. The RTK/RAS/MEK pathway in follicle cells has an important role in specifying dorsal patterning in oocytes. Less is known about the role of oocyte factors in dorsal axis determination. Past literature has reported that disruptions to MEK homologs, such as Licorne, disrupts dorsal patterning. Our lab investigated the role of the MEK homologs Licorne, Dsor 1, Hep, and MKK4 by disrupting them through RNA interference in both germline and follicle cells. Since insulin can also activate the RTK/RAS/MEK pathway, we tested

the effects of nutrient-altered diets on dorsal appendage formation, using different diets that modify insulin secretion in vivo, specifically yeast- and sucrose-enriched diets.

Florida International University

Studying Desire for Control & Theory of Mind Through a Cooperative LEGO Building Task

Jenna Redmond & Grace Flatscher

Jennifer Blessing

The present study investigates the relationship between desire for control and theory of mind (ToM) through a cooperative LEGO building task. ToM refers to the ability to understand that someone else's beliefs, behaviors, and feelings are different than our own (Frith & Frith, 2005). It was hypothesized that those high in desire for control have a lower satisfaction with the LEGO task and there may be a relationship between theory of mind and desire for control. Participants, tested in pairs, built LEGO models from abstract or realistic forms. There were four models, one participant gave instructions while the other built without seeing the model, with a 7-minute window per build. After, participants were sent to computers to complete the surveys and questionnaires. They started with an executive functioning task. Then questions were completed about the LEGO task, measures of theory of mind, a measure of egocentrism, and a 20-question desire for control survey. Initial results came from 36 college students, with a mean of 18.9 years (SD = .9). There is a correlation between liking the LEGO task and saying how good you thought your partner was at following ($r = 0.347$, $p < 0.038$). A negative correlation was found for the "reading of the eyes" test which is a theory of mind assessment. The higher you score on control, the lower ToM ($r = -.456$, $p < 0.007$).These findings suggest that the LEGO task requires a level of spontaneity that can limit those who prefer control over a situation.

University of Tampa

Potential Druggable Pockets from NS2A in Zika Virus for Antiviral Development

Jennifer Samantha Santana

Dr. Jessica Siltberg-Liberles

Flavivirus are made up of different proteins with specific functions, making a single stranded enveloped virus. Antibody-Dependent Enhancement (ADE) is critical when dealing with viral implications from flaviviruses. ADE complicates development of vaccines for flaviviruses as it can increase the possibility of enhancing the virus infection instead of preventing it. The objective of this research is to identify broadly neutralizing antiviral targets in flaviviruses and to evaluate if NS2A in Zika virus is a promising prototype for flaviviruses. This evolutionary study focuses on using various bioinformatic tools to further study Flavivirus and potential drug pockets that can be explored as broadly neutralizing antiviral targets in flaviviruses. Within the pockets, evolutionary rate, IUPRED score and confidence scores were investigated to determine their utilization. Protein NS2A was studied within the Zika virus to target druggable pockets for antiviral development. NS2A is essential in the role of viral RNA replication and helps with the assembly of the host cell. To decrease the likelihood of mutations of flavivirus antiviral targets, finding pockets with high confidence and low evolutionary rates can help. Three pockets were found, but none had great findings all around. While all the pockets have low disorder scores, its evolutionary score are what made these pockets weak targets. Thus, NS2A from Zika virus does not seem to hold promise as a prototype for flaviviruses.

Florida International University

Angiopoietin-like 4 as a potential therapeutic target for clear cell renal carcinoma

Jeremy Kleberg

Dr. Ryan Kolb

Angiopoietin-like 4 (ANGPTL4) is a secreted protein upregulated in a subset of patients with clear cell renal carcinoma (ccRCC), where higher expression is correlated with improved survival. ANGPTL4 undergoes cleavage, with its C-terminal domain (cANGPTL4) implicated in angiogenesis regulation. Our studies investigate the therapeutic potential of targeting cANGPTL4 in ccRCC. We demonstrated that anti-cANGPTL4 treatment reduces endothelial tube formation in RCC4 and 786-O cells and decreased tumor growth in 786-O cells, both ccRCC models. Interestingly, cANGPTL4 treatment in CAKI-1 cells had no significant effect on tumor growth; however, ANGPTL4 knockout in CAKI-1 cells led to a marked decrease in endothelial cells, suggesting a complex role of cANGPTL4 in tumor angiogenesis. These findings indicate that cANGPTL4 may serve as a therapeutic target in angiogenesis-dependent tumors.To elucidate the mechanism underlying cANGPTL4-mediated angiogenesis, live-cell receptor capturing identified endothelial cell-surface chemotaxis regulator (ECSCR) as a potential receptor. This interaction was validated through binding assays, confirming a direct interaction between cANGPTL4 and ECSCR.

Overall, our results provide novel insights into the role of cANGPTL4 in ccRCC progression and highlight its therapeutic potential in angiogenesis-driven cancers. This research could provide a potential drug target, especially since ccRCC patients often become resistant to tyrosine kinase inhibitors after one year of treatment.Future studies will further explore the cANGPTL4-ECSCR signaling pathway to develop targeted therapies for ccRCC.

University of Florida

Dynamic Nearest Neighbor Search: A Comparative Study and Visualization Framework

Jessica Lourenco & Zhengxiao Wang

Dr. Alper Ungor

Dynamic nearest neighbor search (DNNS) is a critical problem in computational geometry with applications in robotics, machine learning, and spatial data analysis. While traditional nearest neighbor algorithms such as brute-force and KD-trees are well-suited for static datasets, dynamic scenarios—where datasets evolve through additions, deletions, or updates—pose unique challenges. This research focuses on analyzing DNNS algorithms, including brute-force, KD-tree, and graph-based approaches, to understand their performance and trade-offs in dynamic settings.

Synthetic datasets are constructed to simulate diverse spatial distributions, including uniform, clustered, and grid-based arrangements, with dynamic updates reflecting real-world scenarios. The algorithms are evaluated based on runtime efficiency, memory usage, update performance, and adaptability to changing data distributions. By addressing these metrics, the research aims to identify the strengths and limitations of each algorithm.

A key contribution of this study is the creation of an interactive visualization platform using Python libraries. The platform offers real-time animations of DNNS operations, showcasing query paths, dataset modifications, and algorithmic steps. It enables side-by-side comparisons of methods, providing intuitive insights into algorithmic behavior and adaptability.

This research aims to advance the understanding of DNNS algorithms, offering both theoretical insights and practical tools for their application in dynamic environments. By integrating algorithmic analysis with visualization, the study contributes to the broader field of computational geometry and its practical implementation across multiple domains.

University of Florida

Fundus Reflex Assessment for Healthcare Providers Not in Ophthalmology: A Simulation-Based Training

Jessica Olivera

Dr. Elena Bitrian

The fundus reflex assessment, the examination of proper reflection of light through the pupil, is a non-invasive way to detect for detrimental and time-sensitive ocular pathologies in pediatric patients, such as glaucoma. This study is investigating if mannequin-based simulation training is an effective way to teach fundus reflex assessment in healthcare providers with no ophthalmology background. Specialized mannequins with 3-D printed eyes were used to simulate infants and varied manifestations of the fundus reflex. Pediatric residents filled out a pre and post-simulation survey, and recorded their findings of the mannequins as they examined them with a direct ophthalmoscope. They saw a brief video of education and recorded their findings a second time. Accuracy and potential improvement were assessed. Nine out of the thirteen participants correctly assessed abnormalities on both attempts of the simulation. Most of the pediatric residents correctly assessed fundus reflex abnormalities on both passes of the simulation. This is possibly due to the obvious presentations of the mannequins. The presentations were intentionally made obvious to serve as a baseline. Furthermore, participant feedback did suggest more difficult presentations in the mannequins. Considering this would allow for the development of a more refined module for future testing and application as the goal is to build a standardized model of teaching to distribute across a wide variety of healthcare providers outside of ophthalmology who treat pediatric patients. Simulation-based training is a potentially effective teaching model to train on the assessment of the fundus reflex for healthcare providers not trained in ophthalmology.

Florida International University

Can an Invasive Species Change Native Behavior? An Investigation into Cannibalism Among Mangrove Crabs Associated with the Invasive Brazilian Peppertree.

Jessie Wahlers

Dr. Kristian Taylor

The spread of the invasive Brazilian peppertree (Schinus terebinthifolius) has been well documented in the Tampa Bay area. What is not well understood is the impact this spread will have on local environments. Previous work has shown that the Brazilian peppertree is not easily

incorporated into the nutrient cycling facilitated by the mangrove crab (Aratus pisonii). The crabs feed mainly on live and senescent leaves, most commonly from the red mangrove (Rhizophora mangle), directly affecting mangrove physiology and nutrient cycling. The crabs are also connected to various trophic levels as prey, omnivores, and detritivores. Previous work has shown occurrences of A. pisonii cannibalism upon exposure to Brazilian peppertree, but it is unknown if the rate is higher than with mangrove exposure. This research hypothesizes Brazilian peppertree will induce a higher rate of cannibalism in comparison to the mangroves. Mangrove crabs were collected from around the Tampa Bay area and their behaviors were compared when exposed to Brazilian peppertree and red mangrove. There appeared to be no significant difference in cannibalism rates overall, but there may be other factors to further discuss such as females having been eaten more frequently across treatments and cannibalism occurring earlier on within the Brazilian peppertree treatment compared to the mangrove treatment. As keystone species of the mangrove forest, mangrove crabs are foundational. This makes it vital to analyze how new factors may be influencing their lifestyle as these factors can potentially hinder the local nutrient cycle and create a negative cascade effect.

University of Tampa

Transcriptional Differences in Intrinsically Disordered Proteins Associated with Obesity in Danio rerio

Jillian Arzoumanian

Kimberly Dobrinski

Obesity is a growing global epidemic and one of the leading causes of preventable death, suggesting to be major contributors to the increasing prevalence of medical diseases, including cardiovascular disorders, type 2 diabetes mellitus, and various types of cancer. The objective of this study is to build a model using Danio rerio (zebrafish) to explore the role of intrinsically disordered proteins in transcriptional differences associated with obesity. D. rerio are a widely recognized model organism, sharing approximately 70% of their genetic identity and 84% of disease-associated genes with humans, along with possessing key organs, including the pancreas, adipose tissue, kidneys, and the liver, all of which play crucial roles in human regulation. Zebrafish were randomly assigned to one of two dietary groups and fed frozen Artemia at varying amounts: a control/normal group (6 mg) or experimental/overfed group (60 mg). Body Mass Index (BMI) was used to assess and confirm obesity, with liver tissues then dissected for RNA sequencing to generate short-read sequences and evaluate transcriptional differences between the two groups. Proteins identified as over- or under-expressed in obese fish were analyzed for intrinsic disorder using IUPRED and PONDR, with Gene Ontology (GO) analysis providing detailed insights into cellular and molecular functions. This study offers valuable insights into the mechanisms underlying obesity, highlighting proteins that have intrinsic disorder that may contribute to disease progression and serve as potential therapeutic targets.

University of Tampa

Behavioral Validation of Salicylate-Induced Hyperacusis in CBA/CaJ Mice Using an Active Avoidance Paradigm

JM Warith Rahman

Joseph Walton

Hyperacusis, characterized by heightened sensitivity to everyday sounds, significantly impacts individuals' functionality in noisy environments. Despite its clinical importance, effective treatments remain scarce, emphasizing the need for reliable evaluation methods. Animal models, particularly rodents, are invaluable for understanding hyperacusis mechanisms due to their auditory processing similarities to humans. This study evaluates the utility of the active avoidance (AA) task, an operant conditioning based behavioral tool, for assessing hyperacusis in rodents. We hypothesized that sodium salicylate, known to induce hyperacusis-like symptoms by increasing auditory sensitivity, would enhance AA task performance. Fourteen CBA/CaJ mice underwent baseline AA training (≥75% accuracy across 32 frequencies, 8–36 kHz, at 70 dB SPL). Animals then completed three sessions under salicylate administration at 70 dB and 50 dB SPL, followed by washout and saline testing. Acoustic startle testing validated hyperacusis-like behavior. Nine mice exhibited increased conditioned response rates (96% at 50 dB, 95% at 70 dB) and decreased latency (2.14s at 50 dB, 2.00s at 70 dB) compared to baseline (90% response, 2.66s latency). Latency effects varied by frequency with greater effects at higher frequencies for 50 dB and lower frequencies for 70 dB. A strong negative correlation between conditioned response rate and latency further differentiated hyperacusis-positive from non-responding mice. These findings validate the AA

task as a reliable tool for hyperacusis research, offering insights into sound sensitivity mechanisms and aiding the development of therapeutic strategies.

University of South Florida

Is That Supposed to be an Ant: An Undergraduate DNA Barcoding Experience

Joan Go, Samantha Cruz, Kalel Garcia-Herreros, Kylie Labra & Jesus Ruiz-Cantellano

Dr. Mintoo Patel, Dr. James Hawker, Dr. Daniel Sanches, Dr. Joseph Velenovsky IV

DNA barcoding is a modern technique for the identification of a species by analyzing a specific segment of DNA, or their barcode, which is unique to every organism. Our project dove into the basics of DNA barcoding by classifying two unknown arthropods — one spider and one ant — from the Lake Wales Ridge, a part of the North American Coastal Plain biodiversity hotspot. Our goal was to identify the genus and species of these two arthropods to gain a fundamental understanding of the procedure's methodology. The specimens' DNA was extracted and approximately 700 base sequences were amplified through a polymerase chain reaction (PCR) using the invertebrate/ant cytochrome c oxidase subunit I (COI) forward and reverse primers. DNA fragments were separated and viewed through gel electrophoresis using a 2% agarose solution. Lastly, the sequences were sent to the DNA sequencing company Genewiz and were viewed on DNA Subway, a bioinformatics program. From there, sequences were trimmed, aligned, and compared with other pre-recorded sequences on the platform. The ant was identified as the Pseudomyrmex gracilis and the spider as the Gasteracantha cancriformis. Our study provided practical experience in DNA barcoding, crucial for documenting Earth's diminishing biodiversity and for the potential discovery of new species.

South Florida State College

Hormonal Contraceptive Status and Women's Relationship Dynamics: A Study of Satisfaction, Commitment, Investment, and Interest in Alternatives

Joanna Gerges

Ms. Sierra Peters

Previous research suggests that hormonal contraceptives (HCs) may influence women's thoughts, feelings, and behaviors within their relationships (Cunningham & Hill, 2022). The Investment Model of relationships (Rusbult et al., 1998) suggests four crucial outcomes worth considering: relationship satisfaction, commitment, investments, and interest in alternative partners. The goal of the present research was thus to examine whether HC-users experience different levels of relationship satisfaction, relationship commitment, relationship investments, or attention to alternatives compared to normally-cycling women. We recruited 180 female participants from Sona and the community who were involved in long-term relationships. Participants self-reported their hormonal contraceptive status (111 HC-users; 69 normally-cycling), and then completed measures assessing their relationship satisfaction (5 items), commitment (7 items), investment (5 items), and interest in alternative partners (5 items). We conducted independent samples t-tests to explore whether HC-users significantly differed from normally-cycling women across the four relationship outcomes. Results indicated that HC-users reported significantly higher relationship satisfaction and commitment as well as marginally greater investment in their relationships compared to normally-cycling women. HC-users and normally cycling women did not significantly differ in their self-reported interest in alternative partners. It is important to interpret these findings in light of several limitations, including that all measures were assessed using self-report, the sample included women in relatively new, mixed-sex relationships, and data were cross-sectional and correlational. Future research may benefit from exploring how different types of hormonal contraceptives may differentially impact relationship dynamics as well as how women's HC use may be associated with their partners' relationship outcomes.

Florida State University

Analysis of Antibiosis in Capsicum Annuum Varieties Against Thrips parvispinus

Jon Declan Sullivan

Dr. De-fen Mou

Thrips parvispinus is an invasive and polyphagous insect that feeds on many commercially important food and ornamental crops. This species of thrips is native to Southeast Asia and was introduced to Florida in 2020. In 2023, T. parvispinus caused total crop losses of pepper in southern Florida, with losses up to $1 million. Due to its economic importance, an accurate understanding of T. parvispinus' relationship with host plants is needed. There is limited information regarding plant resistance in peppers to thrips infestation. Therefore, the goal of this research project is to assess the antibiotic properties of commercial Capsicum annuum varieties against T. parvispinus.

Five pepper varieties will be evaluated based on the survival rate, reproductive rate, and feeding damage of T. parvispinus females on leaf samples of each pepper variety. Understanding the differences of susceptibility in C. Annuum varieties to T. parvispinus infestation will provide valuable insight into identifying varieties with plant resistance to thrips. Specifically, the results will provide local growers with information on varieties which are more tolerant of or resistant to T. parvispinus enabling informed pest management strategies and planting decisions.

Florida Atlantic University

Anthropogenic Impacts on Stone Crab Physiology: Temperature Tolerance in Menippe Mercenaria

Jonathan Ballard

Philip Gravinese

Anthropogenic activities are increasing ocean temperatures in shallow coastal environments. Subtropical species, like the commercially important Florida stone crab, are living near their upper thermal limit and may not be able to physiologically tolerate extreme marine heatwaves associated with climate change. This study determined the physiological response of female stone crabs (Menippe mercenaria) to temperatures ranging from 24-36 in three-degree intervals. Metabolic rate was measured using closed respirometry by recording the rate of oxygen consumption (mg O2 hr-1) at each temperature. Hemolymph (blood) was also extracted to measure lactate and protein serum concentrations and crab stress was determined using the reflex action mortality predictor test (RAMP). During exposure to elevated temperatures (33-36) stone crabs had higher lactate (179%), protein levels (21%), and RAMP scores (379%) over the ambient parameters. Oxygen consumption also increased with higher temperatures. These results suggest that thermal extremes are likely resulting in stone crabs utilizing anaerobic pathways which can cause lethargy and increase mortality. If stone crabs are not able to acclimatize during thermal extremes future marine heatwaves may pose challenges for the commercial fishery.

Eckerd College

Enhancing Streetscape Digital Twin Modelings through Automated 3D Building Model Refinement

Jonathan Lalla & Jinwoo Jang

Jinwoo Jang

This research project aims to automate the editing process for 3D photorealistic building models through mesh smoothing, vertex adjustment, edge refinement, and texture mapping. A series of manually editing 3D models to improve the realistic and accurate representation of real-world infrastructure can be time-consuming and labor-intensive, especially modeling streetscape infrastructure with many buildings at a scene. My automation approach includes the development of custom Python scripts within Blender software to address modeling errors, such as missing information, unwanted artifacts, and low resolution. The proposed automated approach involves developing instructional scripts that perform all the editing techniques at once instead of manually and individually performing these tasks. The project begins with the collection of 3D mesh data from Google tiles, which are examined in Blender software. Then, custom scripts are developed and applied to the model to precisely correct inaccuracies by filling in missing data, removing unwanted objects, reconstructing vertices and edges, and increasing mesh resolution. The scripts employ techniques such as mesh smoothing, vertex adjustment, edge refinement, and texture mapping to enhance both the visual and structural quality of the meshes. While the scripts automate a significant portion of the workflow, manual oversight ensures the highest level of detail and accuracy. Ultimately, the refined meshes are combined to create a comprehensive 3D representation of the real-world area. This automated approach offers a significant improvement over traditional manual editing methods, enabling more efficient and reliable generation of 3D models. By addressing and correcting errors in the raw data, the project results in a more reliable method of editing 3D meshes of real-world areas. The ability to refine 3D meshes allows this project to be a catalyst for many disciplines, such as urban planning, video-game development, environmental monitoring, enhanced navigation, and

Florida Atlantic University

Water Quality Analysis In The St. Johns River

Jonathan Venable

Dr. Gretchen K. Bielmyer-Fraser

The St. Johns River (SJR) is an important resource for the state of Florida and is home to a variety of aquatic life. The SJR is the longest river in Florida and stretches approximately 310 miles, slowly flowing northward towards the ocean. Pollutants enter the river from a variety of sources and have a long retention time due to slow moving currents, thereby affecting water quality. In this study, water was collected from seven different sites along the SJR, and water quality was assessed. Parameters measured included temperature, salinity, pH, hardness, alkalinity, dissolved oxygen, ammonia-N, nitrate-N, nitrite-N, phosphate-P, and chlorophyll. Results showed that storms and hurricanes during the study had significant effects on water quality. There was an inverse relationship between the salinity levels and chlorophyll levels. The chlorophyll levels increased after the first hurricane indicating an increase in phytoplankton present in the water. In addition to the increased stormwater runoff increasing freshwater input and the levels of pollutants, the severe weather events could have re-suspended nutrients from the sediments. This research highlights the importance of monitoring temporal changes in water quality as well as those surrounding episodic storm events.

Jacksonville University

Exploring Sex Differences: A Cross-Sectional Analysis of Risk Factors and Substance Use Disorder in Sexually Abused Justice-Involved Adolescents

Jordan Barringer

Dr. Micah Johnson

Substance use disorders (SUDs) remain a significant public health concern among at-risk populations such as sexually abused justice-involved adolescents (SA JIAs). The relationship between certain risk factors such as witnessing community violence and emotional dysregulation and SUDs is not well established in the SA JIA population. It is still unknown how these risk factors compound with one another concerning the risk for SUD. This study aims to determine the association between these risk factors and the development of SUDs among SA JIAs. It is hypothesized that female SA JIAs with the risk factors are more likely to experience SUDs, compared to male SA JIAs. A multivariate logistic regression was employed to examine a sample of 9,953 SA JIAs obtained from the Florida Department of Juvenile Justice. The Positive Achievement Change Tool assessment collected information regarding demographics, risk factors, sexual abuse, and substance use. The results were then stratified, comparing male and female SA JIAs, to establish any differences among the groups. Female SA JIAs exhibited higher odds ratios for witnessing community violence (aOR = 2.08, $p < 0.001$) and emotional dysregulation (aOR = 1.86, $p < 0.001$) compared to male SA JIAs (aOR = 1.97, $p < 0.001$; aOR = 1.69, $p < 0.001$). The findings indicate a need for the implementation of trauma-informed SUD treatment programs for victims of sexual abuse, especially those involved in the justice system. These programs can reduce harmful coping mechanisms while fostering healthy behaviors. Consequently, reducing the risk of further victimization and future recidivism.

University of South Florida

Temporal and spatial differences in mercury exposure in Sandbar Sharks (Carcharhinus plumbeus) from the U.S. East Coast.

Jordyn Bharratsingh & Dakota Jacks

Jim Gelsleichter

It is well known that among many marine organisms the accumulation of toxic pollutants increases in top predators because of biomagnification. Many studies have demonstrated that sharks are among the marine predators that often exhibit the highest concentrations of marine pollutants. One of the most notable pollutants is the toxic, non-essential metal mercury (Hg), which has been shown to be elevated in many different shark species; however, much still remains unknown about Hg accumulation in several commercially and recreationally important sharks on the U.S. east coast. This study examined the levels of Hg accumulation in U.S. east coast sandbar sharks, Carcharhinus plumbeus, a common but still poorly studied species with regards to Hg exposure. This study presents temporal trends in Hg levels in Atlantic coast sandbar sharks over a 40-year period (1986-2024), demonstrating a decline in Hg accumulation likely associated with reductions in Hg emissions rates. The study also examined spatial differences in Hg accumulation in Atlantic and Gulf sandbar sharks from recent years. These data demonstrate that, despite long-term declines in Hg accumulation, muscle Hg levels in sandbar sharks from some regions still remain above federal thresholds for human consumption.

University of North Florida

Impact of Cryptococcus neoformans capsular polysaccharide release on microglial purinergic receptor expression and chemotaxis.

Jose David Valles

Luis R. Martinez, PhD, MBA

Cryptococcus neoformans is an opportunistic, neurotropic, and encapsulated fungus that causes cryptococcal meningitis (CM) resulting in approximately 112,000 deaths per year globally, mostly in individuals with HIV/AIDS. Glucuronoxylomannan (GXM) is the main polysaccharide found in C. neoformans capsule, and its accumulation contributes to CM pathogenesis. GXM has immunosuppressive effects and interferes with phagocytic activity, antigen presentation, antibody responses, and cell migration and proliferation. Microglia express both ionotropic (P2X) and metabotropic (P2Y) purinergic receptors that have important roles in proliferation, activation, and chemotaxis. Hence, we will investigate whether GXM interferes with signaling pathways via either ionotropic P2X or metabotropic P2Y receptors. Therefore, we hypothesize that C. neoformans GXM will inhibit PI3K activity by preventing microglia cell signaling through ionotropic and metabotropic purinergic receptors. We will investigate whether signaling through P2Y12R in response to 50 μM of ADP is inhibited in microglia pre-treated with physiological concentrations of GXM. We will use GXM-specific mAbs to neutralize GXM and test its effect on microglia's purinergic receptors. Similarly, control polysaccharides (e.g., amylopectin and LPS) at similar concentrations will be utilized. Our findings will expand our understanding of the molecular mechanisms of C. neoformans neurotropism. We have identified a specific fungal factor (GXM) and specific brain cells (microglia), whose interaction is critical for preventing C. neoformans invasion and colonization of the brain tissue. Potentially, these studies will also facilitate the development of novel therapeutics and preventive measures for combating cerebral cryptococcosis, a disease that globally kills ~20% of AIDS patients annually.

University of Florida

Automated Protein Function Prediction using a Novel Structural Feature Set

Joseph Cagle & Omar Elfayoumy

Dr. Indika Kahanda, Dr. Anirban Ghosh

Computationally predicting protein function is a significant challenge in Bioinformatics. It is a cornerstone problem because the roles played by proteins help us understand biological processes and can lead to new medical treatments. While the protein structure primarily determines its function, researchers have historically used its amino acid sequence as a proxy due to the sparsity of structure data. With tools such as AlphaFold2 providing very accurate predicted 3D protein structures, we now have an excellent opportunity for structure-based function prediction. This work investigates the feasibility of developing novel features on 3D protein structures to improve automated protein function prediction. We are developing new methods to represent protein structures by capturing their key shapes and features using cliques and other properties. By feeding these structural representations into interpretable machine learning models, we aim to make function prediction more effective and easier to understand. We are studying the patterns within protein structures to find features that link to specific biological functions. Preliminary results on yeast data suggest that adding clique information can provide increased performance compared to purely sequence-based features. This work could be significant for biologists and computational scientists, offering a new path to more precise protein function annotation. In the future, we plan to expand this work to human data and use topological features.

Keywords: Automated Function Prediction, Machine Learning, Protein Structure

University of North Florida

Assessment of Federal Reserve's Expansionary Policies Impact on the Housing Market

Joseph Duran, Alex Tapia & Alex De La Portilla

Dr Crystal Taylor

We hypothesize that Federal Reserve expansionary policy has artificially increased demand in both the primary and secondary housing markets. Our curiosity about the long-term effects of the Federal Reserve's actions to exit the 2008 Great Recession led us to explore whether quantitative easing contributed to the surge in home prices following the COVID-19 pandemic. We attribute this surge to a significant increase in mortgage-backed securities (MBS) holdings. To test this, we developed a multivariate regression model predicting changes in home prices using variables such as Federal Reserve MBS holdings, other assets held by the Federal Reserve, the number of homes on the market, the federal funds rate, construction costs, and median days listed on the market. Our dataset includes 92 monthly

aggregate observations from 2017 to 2024. The model produced significant results, identifying MBS holdings and the federal funds rate as active influences on housing prices. Notably, MBS acquisitions support investors and home sellers by bolstering demand. These findings suggest the Federal Reserve could lower home prices by selling MBS holdings, as limiting the availability of loans would reduce demand. However, restricting loans to wealthier buyers could further increase median home prices. For further research, we plan to address the complications of our HPI model while also expanding our dataset to date back to as far as 2007 to form more consistent trends with an increased number of observations.

Florida State University

Microhabitat Manipulation at Display Sites by Male Lance-Tailed Manakins (Chiroxiphia lanceolata).

Josephine Whelan

Dr. Emily DuVal

We examined microhabitat manipulation at the dance perches of lance-tailed manakins to understand the influence of maintenance behaviors on display site vegetation. Lance-Tailed Manakins (LTMs) are lekking passerines that perform cooperative dances on display areas maintained by debris removal and active perch manipulation. We observed a wild population of LTMs in tropical dry forests of Isla Boca Brava, Chiriquí, Panama. We characterized physical attributes of dance perches, then investigated how males (1) respond to disturbances introduced experimentally to the display perch area, and (2) influence the display perch substrate itself. We measured the abundance of seedings deposited below dance perches and in control areas to quantify how male manakins influence the microhabitat of the display area. We measured responses to disturbance by tying a leaf fork to the center or edge of the actively used perch area. Though we found no difference between leaf fork interactions and leaf fork perch location, we documented individual variations in maintenance behaviors. We investigated how male perch biting affects the perch surface by measuring coefficient of friction (μ) of groomed ("marked") areas used for display, compared to "control" areas of the same branch. We tested the hypothesis that perches with a higher kinetic coefficient of friction would allow for faster back-and-forth performance (BNF), a display element requiring high-speed reversal of direction while gripping the perch. Marked areas were not significantly different from control areas in coefficient of friction (μ). The speed of males' BNF displays was individually repeatable, but unrelated to display perch μ.

Florida State University

The Role of Aberrant Tyrosinase in Vitiligo in Pediatric versus Geriatric patients?

Joshua Diaz

Dr. Hector Gomez

Vitiligo is an autoimmune disorder characterized by the destruction of melanocytes, resulting in depigmented skin patches. Tyrosinase, an enzyme crucial for melanin production, serves as a key autoantigen in this process. While its role is well-documented, the age-related differences in autoimmunity between pediatric and geriatric vitiligo patients remain poorly understood. Bridging this gap could guide the development of targeted, age-specific therapies. This study investigates the role of aberrant tyrosinase activity in vitiligo by comparing immune responses and antibody pathways in pediatric and geriatric patients.

Blood and skin biopsy samples from pediatric (n = X) and geriatric (n = Y) patients were analyzed. Enzyme-linked immunosorbent assay (ELISA) and flow cytometry quantified tyrosinase-specific autoantibodies and T-cell responses. Oxidative stress markers and cytokine profiles were also assessed to identify immune dysregulation across age groups. Pediatric patients exhibited higher levels of tyrosinase-specific autoantibodies, correlating with increased Th1 cytokines (IFN-, TNF-α and more aggressive immune responses. Conversely, geriatric patients showed significant oxidative stress, lower autoantibody levels, and greater regulatory T-cell activity, indicating milder autoimmune mechanisms.

These findings reveal distinct age-related pathways in vitiligo progression. Pediatric patients may benefit from therapies targeting antibody and cytokine pathways, while geriatric treatments could focus on reducing oxidative stress and enhancing melanocyte survival. Understanding the variations in tyrosinase-related autoimmunity across age groups provides a foundation for personalized therapeutic strategies, addressing the limitations of current treatments and improving outcomes for patients of all ages.

University of South Florida

Multi-Shock Instability Effects on a Dense Distribution of Particles in a One-Dimensional Regime

Joshua Gillis

Dr. Sivaramakrishnan Balachandar

The effects of a multi-shockwave release are well understood in unconfined regions in the idealized flow regime. The multi-shock effects are much less researched and understood within the context of a multiphase flows involving dense distribution of particles in confined spaces. The prediction of instabilities is applicable to particulate dispersal following a shockwave for methods pertaining to paint splattering a wall and the diffusion of a gas within a room. The leading reason behind the need for a split release shock rests on the presence of the shock's reflection off the outer domain wall. With the presence of a single shock wave, the leading data suggests that the shock's reflection is strong enough to significantly slow, if not mildly reverse, the outward progress of the particle's motion. The theory for this work rests on the principle that a dual shock would provide enough forward momentum to propel the particles to the outer wall before the second reflection counters the particle's motion. We use Euler-Lagrange simulations to model interactions between a constant-design particle bed and various shockwave divisions and release times. Through comparisons between progression with these changes, we examine whether a split-release shock can more effectively disperse particles. The most optimal time for the secondary release is to coincide with the inner reflection of the initial shock, after the particles have encountered the outer reflection. Supporting the future development of dispersal techniques is one of the goals of this work.

University of Florida

The Impact of Fentanyl and Xylazine on Respiratory Control Mechanisms

Joy Yang & Ananya Prakhya

Dr. Narasaiah Kolliputi

The co-administration of fentanyl, a potent opioid, and xylazine, an alpha-2 adrenergic agonist, poses a significant concern in the US opioid epidemic due to its severe impacts on respiratory control mechanisms. This review synthesizes current literature to examine their individual and synergistic effects on central nervous system (CNS) pathways regulating respiration. Respiratory control centers in the brainstem, including the medulla oblongata and pons, play critical roles in modulating breathing rhythms. Fentanyl suppresses respiratory activity by activating mu-2 opioid receptors that decrease brainstem function, impairing responses to elevated CO2 levels, and hyperpolarizing neurons in the pons, leading to upper airway dysfunction. Xylazine activates alpha-2 adrenergic receptors, disrupting rhythmic breathing patterns mediated by the medulla oblongata. A systematic review of studies on fentanyl and xylazine was conducted, focusing on their individual and combined effects on respiratory control. Findings suggest that co-administration of these substances exacerbates respiratory depression by altering mitochondrial activity, adenosine triphosphate (ATP) production, and the excitability of brainstem neurons. Notably, fentanyl and xylazine appear to synergize in targeting key CNS mechanisms, increasing the risk of overdose and mortality. This review identifies critical gaps in understanding the long-term effects of fentanyl-xylazine interactions on CNS function and respiratory physiology. Future research should explore targeted therapies to restore respiratory function and mitigate risks associated with this potent drug combination. Understanding these mechanisms is essential for informing clinical strategies and improving outcomes in affected populations.

University of South Florida

Assessing the Impact of North Carolina Teen Court on Recidivism

Joziah Burnett & Varun Raju

Dr. Alexandra Cockerham

Juvenile delinquency is a persistent societal issue and reducing recidivism among youth offenders is essential for breaking a generational cycle of crime. This research builds on findings from my mentor's past study, which found that the teen court programs reduce juvenile recidivism by nearly 50% in North Carolina. The current study applies similar methodologies to assess the effectiveness of Teen Court in Florida.

Teen court offers an alternative to the traditional juvenile justice system, emphasizing restorative justice principles to rehabilitate first-time offenders. This study hypothesizes that Teen court participants in Florida will exhibit lower recidivism compared to those processed through traditional court systems.

Data for this project were gathered from juvenile court records, interviews, and Teen court program records. A comparative analysis was conducted between Teen court Participant and a matched pair of a participant processed through traditional court.

Then, statistical methods were applied to assess the likelihood of either group to recidivate.

As stated, results showed that Teen court does in fact reduce teen recidivism. As a finance major on the pre-law, I recognize that high recidivism rates are not only a strain on public resources but also represent a preventable issue. These findings could provide valuable insights for policymakers. In addition, this research highlights the need for continued investment into alternative sentencing methods that focus on rehabilitation over punishment.

Florida State University

STAT3: A Potential Therapeutic Target for Plaque Psoriasis

Judah Olugbemi

Dr. Hector Gomez

Plaque psoriasis is a chronic skin condition that causes rapid cell growth, leading to the formation of thick, inflamed, scaly patches on the skin, which affects millions of Americans. Many signaling pathways are implicated in the pathophysiology of the disease, including signal transducer and activator of transcription 3 (STAT3). Current literature suggests the involvement of STAT3 in mediating various immunological pathways implicated with psoriasis. The aim of this literature review is to explore the relationship between STAT3 and plaque psoriasis, and to investigate the potential of STAT3 as a therapeutic target. A comprehensive review of 80 peer-reviewed articles was conducted. Studies that examined the role of STAT3 in psoriasis were included, while articles irrelevant to keywords “keratinocyte”, “psoriasis”, “STAT3”, immune pathway”, “cytokine”, “interleukin (IL) - 6, 17, 22, 23” were excluded. STAT3 inhibition may downregulate the inflammatory immune response implicated in plaque psoriasis, thereby slowing the progression of the illness. STAT3 influences various mechanisms that can contribute to the development of plaque psoriasis, including the promotion of keratinocyte proliferation, the heightened recruitment of T-helper cells, and the upregulation of inflammatory cytokines. This review indicates that STAT3 may represent a therapeutic target for psoriasis management by interrupting the feedback loop between immune dysregulation and keratinocyte activation.

University of South Florida

Bouncing Back: Investigating the Interplay of Team Resilience, Positive Affect, and Performance

Julia Devoe & Dana Smith

Dr. Michael Gillespie

Drawing on the biopsychosocial (BPS) model of challenge and threat (Blascovich & Tomaka, 1996) and the broaden-and-build theory (Fredrickson, 2001), this study investigates if the way in which a dyadic team appraises task demands mediates the relationship between team resilience and team performance. Past studies have linked psychological resilience to better performance outcomes, yet this relationship may depend on the emotional states individuals experience during challenging and stressful tasks. This study hypothesized that the relationship between team resilience and team task performance is mediated by positive affect, which is used as an indication of challenge appraisal. Seventy-one dyads participated in a timed interdependent bomb-defusal task in which one participant used a manual to provide instruction for solving task modules, while the other interacted with six virtual modules. Mediation analyses revealed team resilience significantly predicted team positive affect (ß = .34, p = .009), and team positive affect significantly predicted team performance (ß = .32, p = .011). Team positive affect fully mediated the relationship, as the relationship between team resilience and team performance was not statistically significant ($p < .10$). This relationship suggests teams with greater resilience appraise stressful situations more positively, reflected in higher positive affect, which enhances team performance. The results of this study contribute to understanding how team-level constructs like resilience and positive affect impact outcomes such as a team performance, offering insights for improving team dynamics in high-stakes or collaborative settings. Further research should be conducted to evaluate appraisal using a more directs means of measure.

University of South Florida

Chemotherapy vs Microrna Therapy in Non-Small Cell Lung Cancer

Julian David Guinand Rincon

Amy Bohan

Non-small cell lung cancer is characterized by uncontrolled cell proliferation in the lungs. Many treatment strategies have been carried

out for this disease to improve the patient's conditions, although they can range from surgical interventions to more advanced systemic therapies. The purpose of this project is to compare two therapeutic techniques for non-small cell lung cancer: chemotherapy, a widely used conventional treatment, and microRNA therapy, an emerging and targeted therapeutic strategy. I hypothesize that chemotherapy has significant negative consequences for the health of patients due to its less targeted approach, so it should be replaced by microRNA therapy as it is more effective for non-small cell lung cancer because it offers a targeted approach with a reduced probability of adverse side effects.

By using a hypothetical experimental design, this project evaluated both therapies in the five stages of non-small cell lung cancer. Although chemotherapy proved effective in reducing tumor size and prolonging survival at certain stages, complementary interventions, such as surgery and radiotherapy, were needed to achieve significant results. MicroRNA therapy has shown promise in targeting specific molecular processes, such as cell growth, migration, and angiogenesis, with fewer theoretical side effects; however, a lack of comprehensive clinical data limits its evaluation.

The results suggest that chemotherapy and microRNA therapy have unique advantages and limitations. MicroRNA therapy has the potential to replace traditional treatments in the future due to its specificity and lower systemic toxicity. However, this will require substantial research and clinical trials to establish their efficacy and safety.

New College of Florida

3D Bioprinting of Soft Magnetic Bacterial Flagella-Inspired Microswimmers

Juliana Castelli

Dr. Jamel Ali

Microswimmers, inspired by motile microorganisms, represent a promising class of active materials capable of navigating viscous fluids for biomedical and environmental applications. Despite significant advancements, synthetic microswimmers face challenges such as limited biocompatibility, biodegradability, and efficient control mechanisms. This project aims to address these challenges by developing hydrogel-based helical microswimmers using two-photon polymerization (2PP) technology. Here, gelatin methacryloyl (GelMA), a biocompatible hydrogel known for its drug-loading capabilities and biodegradability, serves as the primary material, enhanced with magnetic iron oxide nanoparticles to enable precise control through external rotating magnetic fields. We identify and optimizing 2PP printing parameters, such as laser power, scanning speed, and layer resolution, to fabricate microhelices. We evaluate the swimming dynamics, particularly step-out frequency, under varying magnetic field conditions, establishing their efficacy in controlled navigation. By systematically analyzing the influence of magnetic nanoparticle loading on printing parameters, mechanical properties, and swimming behavior, this project seeks to advance the design and functionality of microswimmers. The outcomes will contribute to the development of tailored microswimmer systems for applications in targeted drug delivery and environmental remediation, offering innovative solutions to longstanding challenges in synthetic microswimmers.

Florida State University

The Intersection of PANoptosis and Lung Cancer: A Literature Review

Julio Cesar Blanco III & Saiba Khan

Dr. Narasaiah Kolliputi

PANoptosis is a programmed cell death pathway that combines pyroptosis, necroptosis, and apoptosis (PNA) to exacerbate inflammation and tissue damage in lung diseases. The genetic link between lung cancer and PANoptosis has driven research into PANoptosis' mechanisms and its role in regulating cell fate under stress. This literature review examines PANoptosis pathways in lung cancer in relation to their impact on tumor growth to better understand possible treatment options. A systematic search using keywords such as "PANoptosis," "lung cancer," and "inflammation" was conducted in databases like PubMed and Google Scholar. Studies employing analytical techniques were reviewed for their insights into cell death markers, inflammatory cytokines, and immune interactions. The results revealed a significant increase in immune cells, specifically NK and myeloid cells, in both primary and metastatic tumors compared to normal tissues. This suggested a heightened immune response potentially linked to the activation of PANoptosis pathways via inflammatory cytokines such as TNF-α and IFN-γ. There was also evidence linking PANoptosis to components of PNA, indicating a cooperative role in attacking tumors. These findings emphasize the dual role of PANoptosis in forming the tumor microenvironment, as its activation by immune cells and inflammatory cytokines contributes to both tumor suppression and tissue damage. Although the existing literature is limited,

this study highlights PANoptosis's impact on tumor dynamics and reinforces the need for further research on its therapeutic potential in lung cancer. This groundwork underscores PANoptosis as a promising target for future interventions in tumor microenvironment management.

University of South Florida

GDNF-Based Neuroprotection in Parkinson's Disease: The Role of Advanced Nanotechnological Delivery Systems

Jumana M. Ahmed

David Garrison

Parkinson's disease is characterized by the progressive loss of dopaminergic neurons in the substantia nigra region of the brain, leading to debilitating motor symptoms such as tremors, rigidity, and difficulty of movement. Glial cell-derived neurotrophic factor (GDNF), a protein essential for neuronal survival, has shown promise in protecting and restoring these neurons in preclinical models, but clinical translation remains limited due to significant delivery challenges. Traditional methods, including intracerebral infusion and gene therapy, face barriers such as invasiveness, uneven distribution, and an inability to consistently cross the blood-brain barrier. This secondary research investigates nanotechnology's potential in addressing these delivery limitations. Engineered nanoparticles, including liposomes, carbon nanotubes, polymeric micelles, and mesoporous silica nanoparticles, offer novel solutions by enabling targeted, non-invasive delivery across biological barriers and sustained therapeutic release. These nanoparticles are designed to enhance bioavailability, ensure effective and targeted delivery to dopaminergic neurons across biological barriers, and reduce systemic side effects often associated with traditional approaches. The findings emphasize how nanotechnology not only overcomes the shortcomings of traditional delivery systems but also facilitates a shift from symptomatic relief to long-term regenerative and neuroprotective therapies. By integrating biological mechanisms with engineering innovation, these approaches pave the way for precision medicine applications tailored to individual patient needs. Ultimately, this research contributes to the development of scalable, adaptable delivery systems that could transform Parkinson's disease treatment and inspire advances in therapies for other neurodegenerative conditions. Future work will focus on optimizing these nanocarriers for clinical translation, ensuring safety, reproducibility, and patient-specific adaptability.

University of South Florida

Cognitive and Psychosocial Effects of Piano Training in Patients With Cancer Diagnosis

Kadence Relente, Lucas Lee & Pranav Kanthala

Dr. Jennifer A. Bugos

Music training interventions administered in a group format are efficacious at improving adult's quality of life; however, few studies examine the effects of active music training on quality of life in patients undergoing cancer treatment. We hypothesized that group piano training would be more beneficial than individual piano training on overall mood and well-being. Participants (N=13) were recruited from Moffitt Cancer Center, with criteria of an active cancer diagnosis and <3 years of formal music training. Participants were randomly assigned to a 9-week group or individual piano program. All lessons were taught using a manualized program, Keys to Staying Sharp (Bugos, 2018). Measures consisting of memory, cognitive speed, and well-being were administered pre- and post- training. Participants completed a follow-up interview to examine program perceptions. The mean difference in pre vs. post Quality of Life Scale (QLS) scores across all participants was significant with p=0.022 in a two-tailed paired samples t-test. The group mean for Beck Depression Inventory (BDI) score improved from 8 to 4.25, while the individual mean improved from 9.5 to 6.75. The Flanker Task was also significant with p= 0.042 in a two-tailed paired samples t-test. The trendline indicated that group-based participants exhibited higher mental inhibition/attention, while individual-based participants exhibited lower mental inhibition/attention, indicating benefits regarding group music training. Interview data revealed that participants perceived improvements in overall well-being. The results suggest that piano training, especially in a group setting, may be therapeutic for patients undergoing cancer treatment.

University of South Florida

Identification of Neuronal Populations in the Anterior Cingulate Cortex Active During Chronic Pain

Kaleigh Harbin

Dr. Akihiko Ozawa

Chronic pain is a significant health challenge that adversely affects quality of life by combining sensory and emotional components arising multiple brain regions. Among these regions, the anterior cingulate cortex (ACC) plays a pivotal role and has been implicated in various psychiatric disorders, including chronic pain. The ACC interprets the emotional and distressing aspects of pain, linking it to adaptive behavioral responses. This part of the brain also integrates sensory, emotional, and cognitive components of pain, influencing perception and decision-making. In this study, we aim to identify the neural population active during chronic pain in the ACC to gain a deeper understanding of how ACC circuits regulate pain behaviors associated with chronic pain. We use TRAP2 mice, which are genetically engineered to express Cre DNA recombinase under the c-fos promoter, a gene activated in response to neuronal activity. This design allows us to label and study neurons engaged during specific activation states. Immunohistochemistry combined with cellular markers, is performed to characterize the neuronal populations activated under chronic pain conditions. Immunohistology indicates that a number of activated neurons are co-stained with SATB2, a marker for excitatory neurons. In addition, inhibitory neurons, including somatostatin- and parvalbumin- positive neurons, are activated during chronic pain, while other inhibitory neurons expressing vasoactive intestinal peptide active during chronic pain are rarely found. These findings may help uncover the distinct ACC neuronal circuits responsible for regulating behaviors associated with chronic pain, offering deeper insights into the mechanisms underlying pain processing and modulation in the ACC.

Florida Atlantic University

Multidimensional Connectedness as a Facilitator to Attaining Wellbeing among Men and Boys

Kamalie Thomas & Khushi Chauhan

Dr. Michael Rovito

Although males are privileged in many regards within society, of well-being metrics, a different narrative emerges. Globally, men live an average of six years less than women and consistently die in greater numbers for the top ten causes of death across most nations. The Theory of Normative Contentment indicates that society has become accustomed to men living sicker and dying younger. We hypothesize that the normalization of a homogenous sense of how men should act within society discourages the expression of masculinity on the margins, creates a dominant 'monolith masculinity', and discourages connection from their true selves and between other men and society. To address this, our study aimed to develop the Theory of Male Connection (TMC), a framework aligned with Critical Studies of Men and Masculinities (CSMM) to support healthy, authentic expressions of masculinity. Through literature review and phenomenological methods, we conducted 30 in-depth interviews, each lasting an hour. These interviews explored five key areas: 1) definitions of male connectedness, 2) how, when, and why males connect with others, 3) reasons for self-isolation, 4) the impact of societal-imposed isolation, and 5) perceptions of masculinity's influence on health behaviors. The insights gathered provide the foundation for the beta version of the TMC. The TMC has the potential to serve as a working model for designing future interventions that deliver more effective services and messages to vulnerable male populations. This presentation will highlight our primary findings, offering valuable perspectives on emerging masculinities in contemporary society.

University of Central Florida

Investigation of the Potential for Neural Inflammation Induced by Continuous and Repeated Peripheral Nerve Stimulation Using Ultrahigh Field MRI (21.1 Tesla) and a Rat Model

Kara Lane-Lightfoot & Alexander Campbell

Dr. Shinho Cho

Peripheral nerve stimulation is used for chronic pain management, rehabilitation, and studying nerve responses and regeneration mechanisms. However, continuous high-frequency stimulation can over activate the brain's somatosensory areas, potentially inducing or worsening neural inflammation. Despite its widespread use, the effects of stimulation intensity, frequency, duration, and current characteristics on neural networks like the somatosensory cortex and thalamus are not well understood. This study aims to investigate how electrical stimulation of the rat's whisker area and forepaw affects the somatosensory cortex and thalamus. Utilizing high-speed, high-resolution functional MRI at 21.1 Tesla, we will explore how different stimulation parameters influence

neural activity and the potential for inflammation. Specifically, we'll examine functional and structural changes in sensory processing networks. We hypothesize that such stimulation activates neuroinflammatory mechanism, detectable through changes in T2-weighted images and molecular markers of inflammation. Anticipated results may show that peripheral electrical stimulation contributes to inflammation in targeted cortical regions. This study could provide insights into the mechanisms linking sensory stimulation to neuroinflammatory processes and aid in modeling or evaluating treatments for neurological conditions like neural inflammation, nerve damage, and nerve regeneration.

Florida State University

Assessment of Neurodegeneration in the Cerebellum of Slc39a14-Knockout Mice

Karam Abilmouna

Dr. Tomás Guilarte

Over the last decade, clinical reports have outlined cases of autosomal recessive mutations of the manganese transporter gene SLC39A14, resulting in elevated brain manganese levels and childhood-onset dystonia-parkinsonism. However, the pathophysiology remains unclear, and our lab aims to delineate it. Studies using Slc39a14-Knockout (KO) mice, a genetic murine model of the human disease, show a dysfunctional but structurally intact nigrostriatal dopaminergic system. Yet, the presynaptic dopamine release deficit alone does not fully explain the dysfunctional motor phenotype, suggesting involvement of other neuronal systems and brain regions in the pathophysiology of this disease. To delineate this idea further, a histological characterization of microglial populations was performed. In the brains of Slc39a14-KO mice, there was an overall increase in microglia density in select parts of the hindbrain in the context of highly elevated cerebellar manganese levels. Additionally, a Sholl analysis assessing the morphological activation of the cerebellar microglia demonstrated an increase in activation within the Slc39a14-KO mice. Lastly, when investigating the expression of cleaved caspase-3 (cCASP3), a biomarker of cell apoptosis, immunofluorescent staining revealed significantly elevated cCASP3 levels within the Purkinje cell layer of the cerebellum in Slc39a14-KO mice, indicating the presence of neurodegeneration within this area. In conclusion, this data begins to suggest that neurodegeneration is in fact occurring within the cerebellum of Slc39a14-KO mice, allowing us to better understand the pathophysiology of manganese-induced dystonia-parkinsonism.

My specific contributions to this project were colony maintenance, genotyping, tissue slicing, brain perfusions, region identification for Iba-1, assistance with immunohistochemical staining, and the Sholl analysis.

Florida International University

A Systematic Review of the Efficacy of Tumor-Infiltrating Lymphocytes (TIL), an Adoptive Cell Therapy, in Improving Overall Survival and Response Rates in Patients With Advanced Melanoma

Kareem Suleiman & Faris Hassan

Dr. Olukemi Akintewe

Tumor-infiltrating lymphocytes (TILs) are essential for immune responses in melanoma, with higher TIL grades linked to better survival and treatment outcomes. They play a crucial role in adoptive cell therapy (ACT) for advanced melanoma, offering hope for patients resistant to other treatments. This study evaluates the effectiveness and challenges of TIL therapy in melanoma, highlighting its clinical impact while addressing limitations such as immune resistance, tumor heterogeneity, and logistical hurdles. A systematic review of primary and secondary sources from PubMed, including clinical trials and experimental studies, was conducted. Key outcomes such as response rates, progression-free survival (PFS), and overall survival (OS) were analyzed. The review also explored the role of TIL grades and their relationship to immune checkpoint inhibitors (ICIs). TIL therapy has demonstrated significant clinical benefits in metastatic melanoma, with response rates up to 72% and durable remissions observed in some patients. Studies highlight TILs as prognostic biomarkers, linking higher TIL grades to better survival and treatment responses. However, limitations such as immune evasion and tumor heterogeneity impact outcomes. Emerging strategies, including neoantigen-specific T-cell reactivity and combination therapies, show promise in enhancing efficacy. TIL therapy offers transformative potential for treating advanced melanoma, particularly in patients resistant to standard therapies. Future efforts should focus on refining TIL protocols, optimizing combination therapies, and improving scalability to make this approach more accessible and effective. Addressing these challenges will pave the way for TIL therapy to become a personalized standard of care in melanoma and other solid tumors.

University of South Florida

Evaluating the effects of Bidens alba plant extracts for anticancer activity

Karla Perez Vazquez

Alexis Tapanes-Castillo

Approximately 1 in 8 women in the United States will develop breast cancer at some point in their lives (Shockney, 2023). Although cancer continues to pose a challenge, progress has been achieved through the use of medicinal plants. In this research, we compared the effect of two medicinal plants on invasive BT549 breast cancer cells. Ethanolic extracts were prepared from the flowers of Bidens alba and the berries of American beautyberry (Callicarpa americana). Bidens alba is frequently used in traditional medicine to treat glandular sclerosis, wounds, and colds (Xuan & Khanh, 2016), while American beautyberry is commonly used by Native American tribes to treat malarial fevers and rheumatism (Brakie, 2010). Extracts were tested for their effect on cell viability using MTT cytotoxicity assays. BT549 cells were cultured in vitro and exposed to 1- 44mg/mL of Bidens alba flower extracts. Bidens alba flower extract was found to be cytotoxic at concentrations of 25mg/mL or higher. An IC50 value, which is the extract concentration needed to yield a biological response of 50%, was obtained for the Bidens alba flower extract (22.6 mg/mL). In comparison, a dose response curve indicated the American beautyberry had an IC50 value of 2.0 mg/ml. Lastly, a scratch migration assay was performed on cells treated with 1mg/mL of the Bidens alba flower extract. No significant differences were observed between untreated and treated cells. However, due to unusually high variability in the data, the migration experiment will be repeated to obtain conclusive results.

Miami Dade College

The Truth and Their Versions: Florida Lawmakers and Academic Freedom Across K-12 and Higher Education

Kassandra Faylun

Dr. Robert Cassanello

On July 1, 2023, Florida Senate Bill 266 went into effect, titled "An act relating to higher education, amending s. 1001.706, F.S." Although the language of this bill does not explicitly address which concepts universities are barred from expending funds for, lines 173-179 of the bill text mandate universities to remove any majors or minors in critical race theory, gender studies, and intersectionality therein. The following year, on July 1, 2024, Florida Senate Bill 1264 went into effect, requiring public schools to begin instruction on the history of communism: "Such instruction must inform students that communism poses a threat to freedom."

Both bills are attempts by Florida lawmakers to control classroom topics and what can be taught in K-12 schools as well as in institutes of higher education. These attempts are not the first in Florida, nor are such attempts rare occurrences – the Florida legislature has historically been an active agent in regulating ideas in K-12 education and in higher education. This project aims to illuminate the various ways in which Florida lawmakers have attempted to limit academic freedom and censor topics in the classroom throughout the 20th and 21st centuries, elevating ideas that they support and suppressing the ideas they do not, and the proposed impacts these interventions may have on education in Florida.

University of Central Florida

Association between Oral Health and Metabolic Syndrome in Cancer Survivors from UK Biobank

Katelyn Disler

Dr. Alex Yoon

Metabolic syndrome (MetS) is a cluster of conditions that include elevated waist circumference, triglycerides, blood pressure, blood glucose, and reduced HDL cholesterol. Previous studies suggest an association between MetS and poor oral health, including tooth loss, edentulism, and periodontitis. Both MetS and poor oral health are associated with low socioeconomic status and lack of access to preventative care, which are largely preventable. There is currently a lack of evidence of this association among cancer survivors, so this study aimed to investigate the association between poor oral health conditions and specific components of MetS in that population. This cross-sectional study was conducted using UK Biobank data. Among 32,275 cancer survivors in UK Biobank, there were 13,183 with MetS and 19,092 without MetS. Oral health conditions in UK Biobank included dentures, loose teeth, painful gums, bleeding gums, toothache, and mouth ulcers. Multivariate logistic regression determined the odds ratio (OR) and 95% confidence interval (CI) for metabolic syndrome with oral health conditions. After adjusting covariates, all oral health conditions were associated with statistically significant increased odds of MetS, to be specific loose teeth (OR=1.33, 95% CI=1.15-1.54), bleeding gums (OR=1.31, 95% CI=1.21-1.43), toothache (OR=1.27, 95% CI=1.06-1.52), dentures (OR=1.27, 95% CI=1.18-

1.36), painful gums (OR=1.26, 95% CI=1.07-1.48), and mouth ulcers (OR=1.10, 95% CI=1.01-1.19). Our results indicate poor oral health conditions are associated with increased MetS and its components among cancer survivors. Further research needs to be conducted to examine the differences between oral health conditions and metabolic syndrome in both cancer survivors and cancer-free populations.

University of Florida

Exploring the Emotional Intelligence of Domesticated Companion Animals: Implications for Support and Empathy

Kayla Domres

David Diamond

This study delves into the emotional intelligence exhibited by domesticated companion animals, shedding light on their innate ability to understand and respond to human emotions. This research seeks to uncover the intricate dynamics between humans and their domesticated companions, emphasizing their role in providing support and empathy. By studying the natural emotional intelligence of domesticated companion animals, we contribute to a relative understanding of their significance in society, extending beyond traditional roles. This study's findings carry implications for the welfare of domesticated companion animals and have the potential to influence regulations and rights related to these animals. Moreover, this study advances discussions on the therapeutic applications of these animals and the ethical considerations surrounding their use. Beyond its immediate impact, this research also enriches the fields of animal science and psychology by illuminating the innate cognitive capacities of domesticated companion animals. This study underscores the importance of responsible ownership, fosters public awareness, and promotes compassionate interactions between humans and domesticated companion animals, whether they are specially trained or intuitively empathetic. This exploration into the emotional intelligence of domesticated companion animals, aids in explaining their vital role in our lives and society.

University of South Florida

Using Immunohistochemistry to Gauge the Role of Cholesterol Dysregulation in Alzheimer's Disease

Kayla Win

Dr. Qi Zhang

Alzheimer's disease (AD) is a chronic, incurable disease that imposes an enormous economic and social burden worldwide. One of the major challenges in fighting AD is finding the cause. The popular amyloid hypothesis cannot fully explain the etiology of sporadic AD (sAD), consisting of more than 95% cases. Evidence has pointed to the dysregulation of lipids in the brain, especially cholesterol (Chol), during aging. It is well known that different types of brain cells (e.g., astrocytes and neurons) play distinct roles in brain cholesterol metabolism. And some brain regions (e.g., hippocampus) are more vulnerable to neurodegeneration than others. New tissue-clearing methods like iDISCO and volumetric imaging (i.e., light-sheet microscopy, LSM) allow the study of molecular and cellular changes in large specimens like whole mouse brains. Immunofluorescence labeling was used to distinguish two types of brain cells, neurons and astrocytes, and gauge their cellular Chol regulation by measuring the amount and subcellular distribution of SREBP2, a master Chol regulator in the brain. To probe cholesterol dysregulation and AD-associated pathology, we used antibodies against GFAP and Tuj-1 to distinguish astrocytes and neurons respectively. Antibodies selectively recognizing SREBP2 are used to gauge Chol metabolism change, and antibodies marking AD-related pathologies (e.g., anti-pTau for tauopathy) are used to evaluate neurodegeneration. As such, we systematically document and analyze changes associated with cell type, brain region, genotype, sex, and age in a mouse model carrying genetic modification related to AD. Our results indicate a causative role of Chol dysregulation in AD development.

Florida Atlantic University

Molecular Insights into Sex Differences in Distinct Taste Cell Types

Kaylee Perez

Dr. Timothy Gilbertson

Our recent findings have revealed the presence of significant sex differences in the taste system that may play a role in food preference, intake, and dietary control. The most profound differences are in the taste of dietary fat; we have shown these are tied to the function of estrogen, a sex steroid that plays a role in many physiological systems. In taste, estrogen exerts direct effects on taste cells, thereby modulating the signal transduction pathways for fatty acids, the prototypical stimulus for fat. To ascertain the action of estrogen, we are characterizing the co-expression of known estrogen receptors (ER α, ERß, and GPER1) with fatty acid signaling components using quantitative and conventional PCR alongside immunohistochemistry in male and female mice in Type II and Type III taste cells, the two known fatty acid-responsive taste cell types. While these cell types' role is unclear, we hypothesize Type II cells act as receptor cells while Type III cells may play a more modulatory role. By comparing the expression profiles of these molecules, we aim to identify cell-specific differences in estrogen-mediated regulation of fatty acid signaling. The expression data will be discussed in the context of the known physiology of estrogen's effects on the taste system. Together, this study will enhance our understanding of the source of sex differences in the mammalian taste system and provide insight into the cellular and molecular underpinnings that provide the taste system with plasticity in regards to the control of food preference and food intake.

University of Central Florida

A Systematic Review of Memphis acidalia

Kaylie Johnson

Keith R. Willmott

The genus Memphis (Lepidoptera: Nymphalidae: Charaxinae), encompassing over 60 species, represents a significant component of neotropical butterfly diversity, particularly in canopy habitats across Central and South America. This study investigates the taxonomy of Memphis acidalia and its related taxa, with a focus on clarifying species boundaries and addressing the challenges posed by pronounced sexual dimorphism and intraspecific variation. M. acidalia, distributed east of the Andes and extending into the western Amazon, exhibits notable morphological variability, complicating its taxonomic resolution.

We addressed three primary objectives: (1) to refine the identification of conspecific males and females, (2) to determine species delimitation within the M. acidalia complex, and (3) to establish accurate taxonomic nomenclature. A combined approach of morphological assessment and molecular analyses, including standard DNA barcoding and dissection techniques, was employed. Historical taxonomic literature was also reviewed to resolve ambiguities. Data were gathered through collaboration with the McGuire Center for Lepidoptera and Biodiversity and Universidade Estadual de Londrina, utilizing comprehensive specimen collections, barcodes, and associated metadata.

The findings contribute to a more robust understanding of Memphis systematics, providing essential insights into neotropical butterfly diversity, with implications for species conservation and ecological monitoring programs.

University of Florida

Moscow in the Harlem Renaissance

Kaysyn Jones

Madeleine Stout

In 1932, Dorothy West and Langston Hughes were two of the notable Black artists and intellectuals active in the Harlem Renaissance that were invited by the USSR to produce a film entitled Black and White, intended to be an exposé on racism in the United States. While the film itself would never come to fruition, a close reading and analysis of both writers' archives and notable works would show the profound impact that the months-long expedition had on the way each understood the place of Black Americans in the economic divisions of the United States. Original archival research indicates the divide in class perspectives within the Black community, with Hughes' working class origins coalescing more readily with Soviet Communist sentiments than West's bourgeois upbringing. I hope to indicate the crucial role that international interaction and engagement played in the formation of Black intellectual thought revolving around class in the early 20th century and beyond.

Florida State University

Fake or Real? Unmasking the Role of Personality, Cognitive Reflection, and Modulating Factors in News Perception

Kazi Salsabil &

Dr. Nichole Lighthall

Media plays a crucial role in shaping our perspectives of the world. However, with access to vast information, the spread of fake news has also increased. Fake news content can require individuals to engage with uncertainty by attempting to identify headlines' veracity (real or fake). Few studies have examined the parts of the brain associated with uncertainty at a cortical or surface level. Moreover, one's personality, race, socioeconomic status, and cognitive abilities are important in understanding individuals' perceptions of determining ambiguous news content as fake news. Past studies have evaluated the effects of personality traits and cognitive abilities on an individual's ability to determine misinformation; however, there is a lack of research combining personality and cognitive ability with a fake news task that provides insight into the neural aspects. Thus, the current study will investigate personality by using the Big Five personality test (neuroticism, openness, and conscientiousness subscales only), the cognitive reflection test to assess thinking styles (logical vs non-logical), and moderating factors such as race and socioeconomic status (individual items in the survey). The current study hypothesizes that personality traits, race, socioeconomic status, and cognitive abilities will predict an individual's ability to correctly identify fake news. This study also hypothesizes that the neural mechanisms associated will differ in brain activation patterns in the prefrontal cortex for logical and non-logical thinkers, and this will be predictive of the choices made. Future studies should implement bias and polarization measures to evaluate the impact of decision-making when encountering misinformation.

University of Central Florida

UNet-Flood mapping

Keanna Forbes & Aldridge Kalenga

Dr Seenith Sivasundaram

One of the most frequent natural disasters, floods have been occurring more frequently in recent decades (Schumann et al., 2009). Global warming and population growth are predicted to exacerbate the economic and social impacts of flooding on a worldwide scale (Intergovernmental Panel on Climate Change (IPCC), 2014). Flood damage was projected to have cost the world 65 billion USD annually between 2000 and 2019 (Tellman et al., 2021). The number of persons impacted by this natural calamity is expected to increase in the coming years, as are the related expenses. The number of people impacted by floods worldwide is expected to treble from 72 million to 147 million by 2030, according to climate change projections (Islam and Meng, 2022).Tools like Earth Observation (EO) are crucial for precisely mapping flooded areas in order to effectively manage and assess this increasing flood risk (McCormack et al., 2022). Full utilization of satellite data is essential for flood control since it offers an operationally cost-effective and near real-time flood mapping technology (Giustarini et al., 2016, Pappas et al., 2021). Furthermore, by allowing for more accurate hydraulic model validation and; integrating spatially distributed water levels derived from digital elevation models (DEMs) (Surampudi and Kumar, 2023); or incorporating flooded area data (Nguyen et al., 2022), satellite-derived flood zone visualizations can greatly enhance the capacity to predict floods. In this work we study the flood mapping using satellite images via U-net simulations. Simulation results are presented.

Bethune-Cookman University

Feasibility of Atmospheric Brakes on Mars Ascent Vehicle for Nominal Orbital Insertion

Keanu Brayman

Dr. Tarek Elgohary

Several space agencies are investigating architectures for a Mars Sample Return mission. Their goal is to return samples from the surface of Mars to Earth to be studied. A key part of most proposed architectures is a Mars Ascent Vehicle (MAV), a rocket that would launch the samples into orbit to be captured by an Earth Return Orbiter. Current plans rely on liquid engines, thrust vector control, reaction control systems, or some combination thereof to insert the MAV into the correct orbit. These systems are prone to mechanical failures, degradation during transit to Mars, and exceeding available mass budgets. Atmospheric brakes offer the ability to control the final altitude and velocity of the MAV by varying the drag force on the vehicle during ascent. Such brakes would be lighter and less complex than alternatives and would allow a reliable solid motor propulsion system to be used. However, there is a concern that atmospheric brakes would be ineffective due to Mars's low atmospheric density. In this work, tradespace studies are conducted to estimate the final position and velocity of the MAV as a function of vehicle parameters and initial conditions. The deployment of atmospheric brakes

is simulated at various points of the trajectory, testing multiple open-loop control configurations. Results show that despite the thin atmosphere, deploying atmospheric brakes on the MAV during ascent significantly impacts the final orbit reached. The study will also be extended to show that closed-loop control algorithms can be used to achieve a specified orbit.

University of Central Florida

Transformation and Polymerization of 0D "Buckyballs" Buckminsterfullerenes Into 2D Polyfullerenes and Graphullerenes

Keegan Phayden Suero

Michael Cai Wang

Fullerenes are carbon allotropes of hollow spheres, tubes, and ellipsoids, each with their unique physical, chemical, optical, and electrical properties, suitable for a wide range of applications in energy storage, sensors, catalysis, superconductivity, magnetism, nonlinear optics, and others. Here, we demonstrate the transformation of monomer 0D carbon 60 (C60) fullerene assemblies into two-dimensional (2D) "graphullerenes" through increasing intramolecular interaction and polymerization, induced by a novel solid-state uniaxial thermocompression process. Taking advantage of the high compressibility of the C60 buckminsterfullerene molecular assemblies, the mechanical deformation induces the formation of ultrathin polyfullerenes and monolayer 2D graphullerenes. This 2D transformation of the C60 molecules assemblies on the substrates entails the use of a custom-made solid-state, uniaxial thermocompression setup, with the applied compressive deformation reorganizing and reducing the intermolecular distance between neighboring as-assembled C60s within the assembly. Morphological and spectroscopic characterizations confirm the formation of sub-10 nm polyfullerenes and graphullerenes, providing fundamental insights into the intra-molecular bonding interactions and process-structure relation between the precursor and yielded polyfullerenes. Overall, this novel top-down scalable nanomanufacturing of large-area 2D polyfullerenes and graphullerenes facilitates further investigation of this new class of 2D carbon materials towards unleashing their vast potential applications.

University of South Florida

Patterns and Determinants of Post-Diagnosis Cardiovascular Disease in Hispanic Breast Cancer Survivors

Keidy Bello

Dr. Eunkyung Lee

The development of comorbidities following a cancer diagnosis is commonly observed. Previous studies have identified cardiovascular disease (CVD) as the leading cause of death among breast cancer survivors. The focus of this research is to investigate patterns of CVD post-diagnosis in Hispanic breast cancer survivors using data collected for a larger ongoing study investigating the quality of life among Hispanic breast cancer survivors in Central Floria. Original research conducted surveys and collected data for 408 Hispanic breast cancer survivors who were female, aged ≥ 20 years, diagnosed in 2015-2022, and living in Central Florida, following the state-mandated patient recruitment procedures. For this research, CVD includes hypertension, angina pectoris, congestive heart failure, myocardial infarction, problems with heart valves or rhythm, and stroke, and the participants self-reported the presence of these conditions and when the condition developed. Potential determinants being analyzed include body mass index (BMI), age, education, income, country of origin, and type of cancer treatment. Of these factors, we will identify factors that place women at higher risks of developing CVD post-diagnosis using a multivariate logistic regression. Per preliminary evidence, BMI, age, and socioeconomic status (SES) are expected to be significant risk factors for CVD development. Obesity has been found to be more prevalent in those of lower SES, which could, in turn, increase the risk of CVD. The implications of this study can include identifying gaps in current research and guiding prevention through education via public health initiatives.

University of Central Florida

Brain-wide Mapping of Adaptive Feeding States in Astyanax mexicanus

Keisha Bansal

Dr. Erik Duboue

The regulation of food intake involves the complex coordination of peripheral and central systems that sense caloric need and satiety. Feeding disorders in humans are influenced by intricate genetic

and neural networks, with naturally occurring genetic variation playing a significant role in these conditions. One promising model for studying these mechanisms is the Mexican tetra, Astyanax mexicanus, a species that includes both eyed surface fish and multiple populations of blind cavefish, which have independently evolved in environments of food scarcity. Notably, cavefish exhibit convergent traits of hyperphagia and obesity, making them an ideal subject for exploring the neural and genetic underpinnings of feeding behavior. In this study, we aim to map brain regions associated with feeding by comparing brain activity patterns in fed and starved surface and cavefish. Our approach combines brain mapping techniques to identify neural circuits involved in the regulation of food intake. The findings from this research may provide valuable insights into the peripheral and central mechanisms underlying feeding behavior, with potential implications for understanding obesity in humans.

Florida Atlantic University

Using ChatGPT to Improve Readability of Spasmodic Dysphonia Patient Education Websites

Kelly Clevenger

Dr. Richard Zraick

Online patient education materials often exceed the recommended 6th to 8th grade reading level, limiting accessibility and creating a challenge for the average consumer with low health literacy. At the same time, AI large language models (LLMs) are being increasingly used as a tool across the healthcare field and as an everyday search tool. This study examines how utilizing AI LLMs, specifically ChatGPT, can improve the readability of online patient education materials about spasmodic dysphonia, a neurological voice disorder which causes involuntary spasms in the muscles of the larynx. Fourteen patient education websites addressing the questions "What is spasmodic dysphonia?", "What causes spasmodic dysphonia?", and "How is spasmodic dysphonia treated?" were selected to provide baseline content for comparison with AI-generated output. ChatGPT was then prompted to generate responses to the same three questions using each of the websites as its primary source of information. The readability data of the original and ChatGPT-generated content are currently being analyzed using four readability formulae through the Oleander Readability software and Microsoft Word for Mac. Initial findings suggest that the use of AI LLMs like ChatGPT have the potential to generate patient education materials which more closely meet recommended readability levels, allowing for more accessible patient education materials and promoting the use of plain language in the healthcare field.

University of Central Florida

The role of the proteasome in the Plasmodium falciparum life cycle

Kelvin Asare

Dr. John Adams

Malaria, a life-threatening disease, remains a major global health issue, claiming 608,000 lives in 2022. Malaria illness caused by Plasmodium falciparum parasites is transmitted to humans through the bites of female Anopheles mosquitoes infected with the parasites. The disease often presents with mild, flu-like symptoms, but can lead to death in more severe cases due to high fever and chills that coincide with the parasite's erythrocytic life cycle. Although malaria is treatable, existing treatments are not always effective due to the high recurrence of drug resistance. Therefore, there is always a need to find new prevention strategies. The proteasome, a cellular complex responsible for degrading and recycling proteins, plays a critical role in the life cycle of proteins, particularly those that are misfolded or have short lifespans. Disruption of proteasome function often triggers apoptosis, leading to cell death and compromising parasite survival, which makes the proteasome a promising target for antimalarial therapy. In this study, we aim to investigate the role of the proteasome in the malaria life cycle, with a particular focus on the alpha subunit 1, a key component of the proteasome complex. We aim to make the genetic knock-down mutant of this gene through glmS ribozyme. For this, we are employing PCR and molecular cloning approaches to generate the knock-down construct to evaluate the feasibility of further research on this protein. Overall, this study seeks to enhance our understanding of the proteasome's role in the malaria parasite's life cycle and its potential as a therapeutic target.

University of South Florida

Inflammatory Transcriptional Signature Can Discriminate De Novo and Secondary AML

Ken Dao

Timothy Shaw

Myelodysplastic Syndrome MDS is a myeloid neoplasm and a precursor to Acute Myeloid

Leukemia (AML). Previous studies have demonstrated that de novo and secondary AML could be determined without clinical history if the presence of 'secondary-like' mutations were identified. However, whether transcriptional changes can refine the discrimination of these entities is unknown. Here, we hypothesize that inflammation-driven MDS will be transcriptionally reprogrammed toward a pro-inflammatory myeloid lineage that will be imprinted in secondary AML transcriptomes. Thus, we performed a gene expression analysis of the MDS, secondary AML, and de novo AML samples in the BeatAML2 (N = 671) and GSE15061 (N = 366) datasets. From gene set enrichment analysis, MDS and AML patients with prior MDS (secondary AML) had a higher enrichment for the hallmark inflammation gene set p = 1.1e-04 and p = 8.4e-05, respectively. Several cytokine receptors were consistently enriched in MDS and secondary AML, including IL18RAP, IL18R1, IL1R1, IL2RB, and IL4R. Additionally, we found MDS and secondary AML to be strongly enriched for a monocyte expression signature and strongly correlated with inflammation (p = 6.1e-15). To determine the additive value of transcriptional signatures on genomic data in discriminating de novo and secondary AML, we trained an XGBoost machine learning model to predict secondary AML. Transcriptional signatures refined prediction in a joint genetic and expression model compared to singly genetic model, 0.8122 AUC ROC vs 0.7012 AUC ROC. Collectively, these data suggest that MDS-associated inflammatory and monocytic signatures are imprinted in secondary AML patients.

University of South Florida

Human Hepatocyte Expansion in Microfiber Scaffolds for 3D Bioprinting Applications

Kennedie Cearlock

Dr. Jamel Ali

Liver tissue engineering aims to address the rising demand for transplantable organs and advance innovative treatments for liver diseases. A major challenge is optimizing hepatocyte expansion and functionality in three-dimensional (3D) culture systems over extended periods. This study introduces a novel cationic microfiber system that surpasses conventional two-dimensional (2D) methods in supporting hepatocyte growth and functionality. The human hepatocyte cell line THLE-2 was cultured in both 2D and 3D environments, with advanced microscopy techniques used to evaluate cell morphology and interactions with the microfiber system. Viability and proliferation analyses, performed using Live/Dead and MTT assays, revealed diminished growth in 2D cultures after one week, whereas 3D cultures sustained high viability for up to one month. To enhance the system's versatility, we integrated the microfiber platform into alginate-based hydrogels for 3D bioprinting, demonstrating significant potential in high-throughput hepatotoxicity screening. Rheological tests characterized the mechanical properties of the hydrogels, and extrusion trials successfully produced stable, grid-like bioprinted structures. This work highlights the transformative potential of this novel cationic microfiber-based 3D system for sustained hepatocyte expansion and seamless compatibility with bioprinting technologies. These findings open the door to the rapid construction of printable 3D liver models, offering a more precise and efficient approach to drug discovery for liver diseases.

Florida State University

Cookie Cutter Girls: A Content Analytic Investigation of the "Clean Girl Aesthetic" on TikTok

Kenson Moore

Dr. Madeline Dougherty

It is well-known that social media includes highly idealized content that contributes to the spread of the thin ideal. Many researchers have utilized content analytic procedures to examine specific social media content areas, including thinspiration, fitspiration, and body positivity. However, no content analyses have focused on a popular micro trend known as "Clean Girl Aesthetic." The present study involved a content analytic examination of the themes and characteristics of the "Clean Girl Aesthetic" on TikTok. TikTok videos included in the present content analysis were identified by entering the keywords "Clean Girl Aesthetic" into the search bar on TikTok. Results suggest that the majority of these TikTok videos include women who appear to be in their 20s who are thin, white, and blonde. It was rare for these women to embody characteristics that were not consistent with the thin-ideal, such as acne, wrinkles, or cellulite. Furthermore, the vast majority of women were seen wearing neutral colors, minimal makeup, and gold jewelry. Themes of motivation, commercialism, productivity, and minimalism were common. However, other themes seen in social media's portrayal of the thin-ideal, including thin praise and diet culture, were rare. These results suggest that the "Clean Girl Aesthetic" trend on TikTok promotes the thin-ideal and commercialism to achieve this ideal but does not include as deleterious of messages as other types of content such as thinspiration. Future research should utilize

experimental methods to examine how viewing "Clean Girl Aesthetic" videos impact viewers, especially those who may not embody the thin-ideal themselves.

Florida State University

Chromatography Analysis and Preliminary Phytochemical Screening in Medicinal Plant Extracts

Kenya Arozarena

Dr. Maria del Carmen Pina

Phytochemicals include the diverse chemical compounds found in plants known to have beneficial effects on health. Medicinal plants continue to attract increasing attention because of their potential benefits in the field of medicine and pharmacology. The main objective of this project was to detect the presence of different phytochemicals produced by plants using different extracts. These diverse bioactive substances include carbohydrates, flavonoids, steroids, tannins, terpenoids, and alkaloids that are synthesized in the plant metabolism and play a vital role in promoting health benefits. Qualitative phytochemical analysis was carried out in three plants, Bidens alba (Spanish needles), Piper auritum (Mexican pepper leaves), and Callicarpa americana (American beauty berry). Plants were collected in the organic garden at St. Thomas University. Leaves, stems, flowers and roots were separated, incubated at 37˚C, and grinded them to a fine powder. The extracts were prepared using one gram of material with a 50/50 ethanol/water and 100% ethanol solvent. The mixtures were heated at 50˚C for 15 minutes making a total of thirteen extracts, and the gravity filtration of solutions was used for the phytochemical tests. Their results are reported in the present work. Thin-layer chromatography on all the Bidens alba extracts was performed and the leaves and flowers showed up many components with different polarities. Extracts of flowers and stems are under evaluation for cytotoxicity tests in vitro.

St. Thomas University

Predator and Prey: Genomic resources for the Pink Sundew and its Herbivore the Sundew Plume Moth.

Kerissa Tarpley

Dr. Robert Fitak

Genomic resources are critical for the conservation of threatened species, providing valuable insights into genetic diversity, population structure, and adaptive potential. This study focuses on two ecologically interconnected species: the Pink Sundew (Drosera capillaris) and the Sundew Plume Moth (Buckleria parvulus), whose larvae uniquely feed on the Sundew plant without falling prey to it. The Pink Sundew is a carnivorous plant named after dew-like sticky droplets on its leaves that trap insects. The Sundew Plume Moth has evolved to coexist with the Sundew Plant which is a unique herbivore adaptation. We generated DNA barcodes and mitochondrial (or chloroplast) genomes for both species. DNA extractions were performed using samples of each species, followed by polymerase chain reactions (PCR) to amplify the DNA. The amplified samples went through Illumina and Sanger sequencing. For the Sundew Plume Moth, the CO1 gene was targeted, while Maturase K was used for the Pink Sundew. Mitochondrial genome maps for both species were assembled using Novogene software and annotated using MITOS2 webserver. Genomic resources from this study provide taxonomic and population information, as well as information on species-specific adaptations and vulnerabilities. This genetic information is useful for developing conservation strategies and ensuring the survival of these threatened species and preserving their unique relationship.

University of Central Florida

Biophysical characterization of neurons in the subthalamic trajectories of Parkinson patients during DBS surgery

Khanh Linh Hoang

Dr. Oliver Flouty

Understanding connectivity between neurons is important as it contributes to stimulus encoding, behavior and movement in humans. Parkinson's Disease (PD) is a progressive neurodegenerative disease characterized by abnormal network connections in basal ganglia (BG), leading to movement disorders such as tremor, rigidity, and bradykinesia. During DBS surgeries, microelectrodes were used to record laminar neuronal activity in the subthalamic nucleus (STN, the target for PD) and the surrounding regions. Characterization of neuronal spike types / patterns is crucial to understanding the pathogenesis of PD. After spike sorting the recorded neurons (Spike 2 software) from STN microelectrode trajectories (n = 14 subjects), we classified them into different types using the trough to peak time (spike width time). We found that neurons were broadly classified into three categories based on the threshold of 250 µsec: Regular spiking (RS), Fast spiking (FS)

and triphasic neurons. In the cortex, RS neurons are putatively linked to excitatory, FS to inhibitory, and triphasic to output neurons. FSs send strong and precise inhibitory signals to the target cells and regulate the activity of RSs, which in turn direct movement and behavior. We found a similar distribution of these three types of neurons as reported in the cortex: FS = 30, RS = 23, triphasic = 6. The exact role of triphasic neurons is still not clear in the sub-cortical regions. Further analysis of the firing properties and preferred phases as a function of depth from the target can enhance our understanding of the neuronal networks in PD.

University of South Florida

Outcomes in Liver Transplant Patients with Gastroparesis: A Retrospective Cohort Study

Kiera Johnson & Siyona Praveen

Dr. Vijay Subramanian

An increase in gastrointestinal motility disorders, including gastroparesis, have been reported in liver transplantation (LT) patients; however, their impact on LT outcome is unknown. The aim of this study was to investigate the risk factors associated with gastroparesis and post LT outcomes. A single center retrospective analysis of all adult LT recipients between January 1, 2020 and April 30, 2024 was performed. Gastroparesis was diagnosed pre or post LT. Variables were compared between patients with and those without gastroparesis. Of the 755 LT patients, 37 (4.9%) were diagnosed with gastroparesis. The most common pre-LT diagnosis for patients with gastroparesis was metabolic dysfunction associated steatohepatitis (43.2%), whereas it was alcohol related liver disease in those without gastroparesis (53.1%, p=0.049). There were no significant differences demographic variables including age, sex and race. Pre-LT patients with gastroparesis had a high incidence of diabetes (54% vs 28%, p=0.002). Post-LT patients with gastroparesis were more likely to need tube feeds (45.9% vs, 28.2%, p=0.020), experience dysphagia (40.5% vs. 16.0%, p<0.001) compared to those without. There was also increased risk of aspiration (14.3% vs 7%, p=0.05) in patients with gastroparesis. There was no difference in pneumonia. Gastroparesis patients had significantly longer post LT (25 vs 15 days, p=0.02). About five percent of LT recipients were diagnosed with gastroparesis. Gastroparesis was prevalent in patients with Diabetes and MASH and associated with increase post operative complications and length of stay Identifying these patients pre-LT, can help reduce the risk of these complications.

University of Tampa

Comparison of Visual Outcomes Between ICG and BBG Dyes Used in Macular Hole Surgery

Krish Ghosalkar

Dr. Gokul N. Kumar

Idiopathic macular hole surgery is a vital treatment to restore patients' central vision, yet there seems to be some debate regarding the methodology. This surgery involves a vitrectomy with internal limiting membrane (ILM) peel, requiring a dye so the ILM can be easily stained and removed. Some studies claim that between Indocyanine Green (ICG) and Brilliant Blue Green (BBG), the two dyes that are widely used in the United States, ICG may lead to worse vision improvement due to its greater toxicity. However, these studies assess surgeries performed by multiple physicians or only assess qualitative visual data. Thus, I am conducting a retrospective analysis of Dr. Gokul N. Kumar's patients who underwent macular hole surgery for idiopathic full-thickness macular holes. My analysis involves recording the type of dye used and post-operative quantitative data, such as best-corrected visual acuity (BVCA) and hole closure rates. After conducting an extensive chart review, I found that, on average, ICG patients had a 4% greater visual improvement from their pre-operative BVCA, and hole closure rate was 100% among all acute holes for both dyes. These preliminary findings suggest that ICG could have better visual outcomes. My next steps include continuing my analysis for a larger patient body and analyzing other visual functional parameters such as the length of the Inner Segment/Outer Segment junction. Since this study controls for surgeon variability and focuses on quantitative data, it can provide concrete evidence to help vitreoretinal surgeons decide which dye will maximize patients' visual outcomes.

University of Central Florida

The Mitochondrion-mediated Apoptosis in Thyroid Cancer Cell (MDA-T41): The Role of the Melatonin

Ksenia Lynn Greene & Colten Denby

Dr. Daniel Sanches

The pineal gland produces melatonin, a hormone typically known for modulating several physiological functions, including the coordination of sleep-wake rhythms. Its interactions with cancerous cells and its role in prevention and treatment have been increasingly studied recently. It has been demonstrated that melatonin can improve the efficacy of chemotherapy drugs and directly inhibit neoplastic cell action. In addition, while melatonin typically displays anti-apoptotic

effects in normal cells, it holds pro-apoptotic effects in some other cancer cells. However, the mechanisms by which melatonin affects cell death and metabolism remain unclear and seemingly differ from cell to cell. Our work aims to understand better melatonin's role in thyroid cancer cell (MDA-T41) apoptosis and the pathways and mechanisms involved. We cultured the MDA-T41 cell line and measured cell death levels using the Realtime-Glo Annexin V Apoptosis and Necrosis assay in the presence or absence of melatonin. Our results showed that melatonin provided anti-apoptotic effects to MDA-T41 cells when co-treated with staurosporine, an inductor of apoptotic cell death. Both apoptosis and necrosis were reduced by 50% in melatonin-treated cells twenty-four hours after treatment. Our next steps will be to evaluate if the mitochondrion pathway plays a vital role in this regulation by measuring caspase activities, mitochondrion membrane potential, and the Bcl-2 family protein expression.

South Florida State College

Beneath the Bloom: The Emotional Impact of Early Breast Development and Polycystic Ovary Syndrome (PCOS) on Young Women's Self-Image

Kyla M. Smith

Jazmyne Simmons

This research investigates the profound impact of early breast development on young women and how it intersects with Polycystic Ovary Syndrome (PCOS) to exacerbate psychological and emotional challenges such as depression, body dysmorphia, and self-esteem issues. Early breast development and PCOS, both of which can result in significant physical changes like excessive breast tissue growth, often lead to heightened feelings of discomfort, insecurity, and negative body image during adolescence. These struggles, experienced across various racial and cultural backgrounds, can significantly affect mental health, making young women more vulnerable to anxiety and depression. The study will explore how this combination of factors shapes emotional well-being and how societal pressures amplify these challenges. Additionally, it highlights the need for accessible therapeutic interventions, including counseling, peer support groups, and educational programs designed to help young girls understand their bodies and manage these dual stressors. School-based programs could provide a safe space for open discussion, normalizing body image concerns and fostering resilience. The research also examines the emotional and physical impacts of both surgical options, such as breast reduction, and non-invasive treatments, including the use of metformin for PCOS management. By integrating clinical insights with personal narratives, this study aims to underscore the importance of comprehensive mental health support for young women navigating the complexities of early breast development and PCOS. This research not only seeks to contribute to academic discourse but is also driven by a personal commitment to empower young women facing these challenges, to feel beautiful internally and worthy to succeed.

Florida Agriculture & Mechanical University

Pulmonary Complications of CAR-T therapy, the Mayo Clinic experience

Kylie Overstreet & Ciara Crocker

Abubakr Bajwa

Chimeric Antigen Receptor T-Cells (CAR-T) is a new form of leukemia and lymphoma treatment approved by the FDA in 2017. The patient's own T-cells are genetically altered to express receptors with increased specificity to target cancer cells. CAR-T therapy is known to have potentially adverse effects on the respiratory system, however a comprehensive analysis of the types and rates of the treatment related to pulmonary complications has yet to be performed. A retrospective chart review was utilized to analyze patients who underwent CAR-T therapy from August 30, 2017 to December 31st, 2023. Incidence of respiratory dysfunction was analyzed in the setting of type of pulmonary dysfunction, mortality rate, number of pulmonary-related hospitalizations, type of CAR-T therapy used, comorbidities, and oncological history. Other data of interest included peak respiratory rates and pulmonary function tests during hospitalizations. It was found that there was a high incidence of pulmonary complications in patients receiving this therapy, with Acute Hypoxic Respiratory Failure and Infectious Pneumonia being the most common complications patients had to endure. Yescarta was the most common form of CAR-T treatment used amongst the patients analyzed, however it also had the highest mortality rate of all therapies with 58% of patients being deceased. Based on this study, it could be suggested that physicians consulting patients for CAR-T therapy should mention the risks of developing pulmonary complications.

Stetson University

Awareness of Your Dating Status Enhances Memory of Relatively Attractive Faces

Kylie Rubino & Vivek Kiluk

Benjamin U. Marsh

In a previous analysis, highly attractive faces were remembered worse than faces average in attractiveness and low in attractiveness. We suspected that the symmetrical similarity among attractive faces made them more difficult to distinguish from one another. While faces lower in attractiveness have more unique facial features. However, what if you change the purpose behind studying each face? In this study, we tested whether making participants aware of their dating status changed how faces are processed and remembered. Participants were randomly assigned to either be asked about their dating status via a survey question (i.e., are you currently dating? Yes, Maybe, No) or not (i.e., control group). A total of 295 participants (89% White; 84% heterosexual) studied 48 faces evenly split among high-attractiveness, average-attractiveness, and low-attractiveness. Faces evenly varied by gender and racial/ethnic category (Asian, Black, Latino, and White). Faces were taken from the Chicago face database (Ma et al., 2015) which also provided attractiveness ratings for the faces. A recognition test was then conducted involving 96 faces. Half were seen during the study phase, and half were new faces. For each face, participants indicated whether they remembered seeing the face during the study phase. Analyses showed that those not made aware of their dating status that was not remembered faces low in attractiveness better than those high and average in attractiveness. In contrast, those aware of their dating status remembered faces average in attractiveness best.

University of Tampa

Adverse Childhood Experiences and Working Memory

Lake Miller

Matthew Chin

Extensive research has shown that adverse childhood experiences (ACEs), such as sexual abuse, poverty, physical abuse, emotional abuse and neglect, can negatively impact an individual's development. The presence of ACEs has also been linked to an increase in one's engagement in risky behavior, dropping out of school, unemployment before the age of 21, and a variety of health issues. Currently, there is a gap in literature regarding the performance of different working memory (WM) tasks and the presence of ACEs. This study focuses on filling this gap in literature by measuring participants' Philadelphia ACE score, which is a 16-item questionnaire, where each question details one possible adverse childhood experience, for each affirmative response the participant receives 1 point. Additionally, their performance is tested on two WM tasks, the Operational Digit Span task and Weschler's Digit Span task. If ACEs are found to be negatively correlated to WM task performance, we may assume a relationship between the presence of ACEs and an individual's WM. It is expected that there will be a negative correlation between the presence of ACE scores and performance on both the Operational Span task and Wechsler's Digit Span task. The anticipated negative relationship between ACEs and WM would shed light on affected individuals' negative performance in academia, health conditions, impulsive decisions, and self-destructive behavior.

University of Central Florida

Mathematical Models of Projectile Motion

Landon Tillman & Claire Hart

Dr. Joseph Mcneil

The parabolic equations of motion for a projectile are fundamental concepts in classical mechanics, commonly applied to the dynamics of satellites, missiles, and rocket launches. This study examines the accuracy of these simplified parabolic equations compared to models that account for air resistance (drag) using experimental data from a projectile. Two drag models are considered: linear drag, where the drag force is directly proportional to velocity, and quadratic drag, where the drag force is proportional to the square of the velocity. While the linear drag model produces a set of dependent differential equations solvable analytically, the quadratic drag model results in more complex equations that are better addressed numerically. In this experiment, a projectile with a known initial velocity is launched at various angles, and its final position is recorded as a set of independent measurements with associated means and sample standard deviations. For each launch angle, z-scores are calculated to compare the experimental data to the predictions of three models: no drag, linear drag, and quadratic drag. The model with the lowest z-scores is identified as the most accurate representation of projectile motion.

Tallahassee State College

The Legal, Ethical, Economic, and Financial Impacts on Community Redevelopment Agencies (CRAs) in Florida since the Passage of Florida House Bill 9 in 2019

Laurel Richmond

Terry Henley, Ph.D.

This qualitative study uses a hermeneutical phenomenology approach to explore the legal, ethical, economic, and financial impacts on Community Redevelopment Agencies (CRAs) in Florida following the passage of Florida House Bill 9 (FL HB 9) in 2019, by interviewing administrators and attorneys of the oldest Florida CRAs. CRAs are dependent special districts, funded by tax increment financing (TIF), and created by governing bodies to address areas deemed as slum, blighted, or facing a shortage of affordable housing. HB 9 intended to address and improve the effectiveness of CRAs by increasing transparency and accountability by ensuring that spending is done in accordance with F.S. 169 to ensure CRAs fulfill their purpose. Given that it has been five years since HB 9 passed and was signed into law, this research is timely and novel in reporting how the law has been implemented compared to its stated aims. The study is expected to reveal whether HB 9 accomplished its goals, ensuring that CRAs effectively fulfill their intended purpose as laid out in F.S. 169. These prospective results will inform state lawmakers and local governments of the implications of the state's involvement in local economic development in Florida.

University of Central Florida

YBX1 Functions in the Drosophila Fat Body to Regulate Sleep

Lauren Campbell

Dr. Elizabeth Brown

Metabolic dysfunction-associated stetatoic liver disease (MASLD) is a chronic liver condition caused by excessive fat buildup in the liver due to factors outside of alcohol consumption. While the exact causes and mechanisms underlying MASLD development are still not entirely understood, sleep dysfunction is associated with MASLD and increasing sleep may contribute to MASLD prevention. Y-box binding protein 1 (YBX1) is a highly conserved multifunctional DNA/RNA-binding protein that modulates many important cellular functions and previous research suggests that hepatic expression of YBX1 increases significantly in patients with MASLD and in mice exposed to a high-fat diet. Flies, like humans, develop symptoms associated with MASLD, including dysregulation of lipid and glucose metabolism, and many genes and metabolic pathways involved in human hepatic diseases are conserved in Drosophila, including YBX1. Ypsilon scachtel (YPS) is the Drosophila ortholog and is expressed in the liver-equivalent fat body. To determine the effects of YPS expression on sleep duration, we manipulated expression of YPS in the fat body and compared their sleep patterns to control flies. Silencing YPS in the fat body significantly increases both sleep duration and the length of individual sleep episodes, suggesting YPS may mediate sleep quality. To further understand the relationship between YPS expression, MASLD, and sleep, we are currently measuring sleep duration in flies fed a high-fat diet when YPS expression is manipulated in the fat body. Overall, this work will inform our understanding of how YPS expression in the fat body mediates MASLD development and its effects on sleep duration.

Florida State University

Cryptic Diversity of Ligia novizealandiae Isopods from Te Ika-a-Māui / North Island of Aotearoa New Zealand

Lauren Gardner

Dr. Carlos A. Santamaria

Ligia are a globally distributed genus of isopods mostly found in the intertidal region of rocky coastlines. Due to their poor dispersal capabilities, Ligia in isolated locations often harbor highly unique genetic lineages. In some instances, these lineages have been shown to represent cryptic species (i.e., two or more morphologically similar species recognized as a single species). We used molecular methods to characterize populations of Ligia novizealandiae from Aotearoa New Zealand and thus determine if cryptic diversity is found within this remote region. We extracted DNA from individuals collected in six localities from Te Ika-a-Māui / North Island of Aotearoa New Zealand. Three mitochondrial genes (CO1, 16S rDNA, 12S rDNA) and two nuclear genes (NaK, 28S rDNA) were sequenced from each individual. Phylogenetic reconstructions indicate the presence of three distinct and well-supported L. novizealandiae lineages: (a) one found in four localities on the western coastline, (b) another found at Moa Point at the southern end of the island, and (c) a lineage found at Waiwera Beach in the northeast. These lineages are highly divergent, as estimates of evolutionary divergence between 16S rDNA sequences using the Kimura 2-parameter amongst genetic range from 13.5% to 29.7% and exceed those reported for comparisons between

Ligia species. To further our understanding of cryptic diversity within Aotearoa New Zealand and determine the presence of new species, additional sampling will need to be conducted on the east coast of Te Ika-a-Māui / North Island and on Te Waipounamu / South Island.

University of Tampa

Investigating the Interaction of Class B JDPs with Hsp70

Lauren Gledhill

Dr. Szymon Ciesielski

Molecular chaperones are a subset of proteins that play essential roles in the quality control of virtually all other proteins in a cell. This project is focused on J-Domain Proteins (JDPs), the obligatory cochaperones of molecular chaperone, Hsp70. There is a large variety of JDPs that can interact with Hsp70 and govern its crucial role in many biological processes within a cell. JDPs are categorized into different classes based on function and structure. The JDPs that facilitate the degradation of amyloid fibrils associated with Alzheimer's disease, along with other essential cellular functions, are referred to as class B. Previous studies of yeast JDPs have recently identified a short helix in a region rich in glycine residues. In class B JDPs this helix is thought to be associated with essential functions, including viability. The goal of this project is to investigate the importance of the glycine-rich region in human class B JDP, DNAJB1. We will purify DNAJB1 and an ATP-bound mutant of Hsp70, HSPA8 T_A, to investigate their interactions using solution NMR. Elucidating structural features of the glycine-rich region and its importance for interactions with Hsp70 will expand our understanding of this crucial aspect of Hsp70 and JDPs mechanism of action.

University of North Florida

Mitigating Heat Strain in Construction Workers Through Artificial Neural Networks

Lauren Nunag & Joseph Spagnoli

Dr. Aaron Costin

Heat stress and strain are significant concerns for construction workers who face prolonged exposure to high temperatures during physically demanding tasks. These conditions can lead to severe health complications, decreased productivity, and increased safety risks, making it essential to develop predictive models to identify and mitigate risks early. This research seeks to address the issue by leveraging artificial neural networks (ANNs) to analyze physiological and environmental data, aiming to predict the likelihood of heat-related illnesses in real-time.

To achieve this, we initially used a Gaussian synthesizer to generate synthetic data but found its results less effective for our objectives. Subsequently, we employed CTGAN (Conditional Tabular Generative Adversarial Network), which produced more promising results. We are now focused on refining the data quality and plan to compare the synthetic datasets with actual data to improve prediction accuracy further. The ANN framework will analyze critical factors contributing to heat strain, such as heart rate, ambient temperature, and physical exertion levels, aiming to achieve high predictive accuracy with simplicity for practical application.

We anticipate developing a model that can identify early signs of heat strain with actionable precision. Ultimately, this model will be integrated into an Internet of Things (IoT) system, such as a wearable heart rate monitor, providing real-time alerts to workers and supervisors. This research has the potential to improve workplace safety, reduce health risks, and set a precedent for using AI in occupational health across physically demanding industries.

University of Florida

TikTok and Distractibility

Leah Jensen & Victoria Mena

Dr. Jessica Kester

The short-form video structure of TikTok fosters instant gratification, weakening self-control and focus, and encouraging habitual media consumption (Ye, J.-H., et al., 2022, p.6). While previous research regarding short-form videos has shown potential for enhancing learning, their fast-paced nature raises concerns about long-term effects on attention spans and cognitive abilities (Zhu, Z.J., Yuan, Y.H., et al. 2022, p.1). The current study explored how TikTok influences college students' perception of classroom distractibility. It investigates the relationship between screen time, self-control, and distractibility, aiming to provide insights into social media's role in attention and academic performance. Researchers surveyed 71 Daytona State College students with questions modified from the Attention Control Scale (ATTC). Survey results revealed that users who either spent low or high amounts of time on TikTok struggled with attention with the low-use group reporting higher distractibility overall. However, the study found no statistically significant evidence that

these results would extend to the population, leaving the direction of the relationship between screen time and distractibility inconclusive. These findings contradict previous research that suggests people with higher screen time would also report higher distractibility (Mekler, 2021, p.148). Rather than focusing exclusively on TikTok, future researchers should address other SVA sources like Instagram Reels and YouTube Shorts and gather a larger sample. Incorporating questions about user preferences and additional contributing factors could provide a more comprehensive understanding of attention deficits linked to social media use.

Daytona State College

Re-Imported Sexuality: Orientalism, Heterotopia, and Prostitution in Nineteenth Century French Art

Leah Lentz

Dr. Adam Guerin

This project aims to investigate the outrage surrounding Edouard Manet's 1865 painting "Olympia" through a postcolonial lens. In this postcolonial lens, it is evident that part of the public's reaction to the painting was due to Olympia's whiteness and, more specifically, Frenchness. Combining a historical understanding of prostitution in France with analysis of several nineteenth century Orientalist oil paintings, Olympia's bed becomes indicative of the heterotopic nature of the painting, and subsequently implicates the French in the reality of French prostitution. Major works explored include Jean-Auguste Dominique Ingres's "Le Bain Turc", Eugene Delacroix's "The Death of Sardanapalus", and Henri Gervex's "Rolla". Analysis of this work reveals the French colonies as heterotopias where white French artists could export sexuality. While many researchers have analyzed "Olympia" through different angles, this work is the first of its kind to apply a postcolonial-Foucauldian lens to the woman on the bed.

Eckerd College

A New Normal? Synthesizing the Documented Impact of the COVID-19 Pandemic on Latina Breast Cancer Survivorship

Leah Scott & Sofia Cuello

Claudia X. Aguado Loi, Ph.D., MPH, CHES, CPH

The COVID-19 pandemic was an unprecedented health event that changed access to routine and preventative cancer care services. The purpose of this scoping literature review is to synthesize the existing literature on the impact the COVID-19 pandemic had on the survivorship experience of Latina breast cancer survivors (LBCS) in the United States. This scoping literature review retrieved articles from PubMed, ProQuest, CINAHL, and PICO databases. Following PRISMA guidelines, we gathered and analyzed all eligible articles relevant to LBCS published from 3/11/2020 to 4/15/2021. Articles were screened, duplicates were removed, and eligibility was determined. 24 articles were included in this review. Themes noted the pandemic exacerbated health disparities and psychosocial challenges among LBCS. Screening and diagnosis delays disproportionately impacted Hispanic women, increasing the likelihood of late-stage cancer diagnoses. Interruptions to breast cancer care, including treatment delays, further jeopardized outcomes for this population. Economic insecurity and loss of healthcare coverage created additional barriers to accessing timely care, amplifying pre-existing inequities. Fear of COVID-19 exposure heightened psychological distress and reduced healthcare engagement. The pandemic's repercussions on LBCS exacerbated existing health disparities and psychosocial burden. It is imperative to acknowledge the pandemic's effect on vulnerable populations. Healthcare and community stakeholders should ramp up outreach efforts and incorporate safeguards to mitigate the unintended consequences that financial instability, healthcare interruptions, and setbacks in preventive healthcare behaviors may place on life expectancy and quality of life LBCS to restore and build on pre-pandemic advancements.

University of Tampa

Examining Fatalism in Hispanic/Latina Breast Cancer Survivors

Liara Lopez Torralba

Eunkyung Lee

As fatalism, a person's attitude towards their life, increases, there is a significant level of medical mistrust and avoidance, which can delay cancer diagnoses and affect the prognosis of the disease. Literature has shown that fatalism can be influenced by many factors including age, race, acculturation, locus of control, education, and fear. However, little research has been conducted on whether the fatalism differs independently by Hispanic origin and its associated factors among Hispanic breast cancer survivors. This study used data from the Hispanic Breast Cancer Study at the University of Central Florida. The original study recruited 408 women, aged ≥

20 years, diagnosed in 2015-2022 with breast cancer, and living in Central Florida, following the state-mandated patient recruitment procedures. Fatalism was measured using six questions in the Multidimensional Fatalism Measure questionnaire, each being scored using a 5-point Likert-type scale, with higher scores indicating a high fatalistic belief. Fatalism scores will be compared by self-reported Hispanic/Latina origin while controlling for potential confounders in the multivariable linear regression analysis. This research will identify potential confounders in Hispanic/Latina breast cancer survivors that previously were unclear. It is expected that fatalism scores will differ significantly by Hispanic/Latina subgroups independently due to differences in cultural beliefs according to their Hispanic origin. The findings from this research can help physicians gain a deeper understanding of breast cancer survivors' attitude towards their life according to their Hispanic origin, which will improve patient care. (A grant from the Florida Breast Cancer Foundation to Dr. Lee supported this study.)

University of Central Florida

Tissue specific compensatory regulation of gene expression associated with copy number variants in Danio rerio

Lillian Cavanagh

Kimberly Dobrinski

Copy number variants (CNVs) refer to the loss or gain of copies of a DNA region within the genome. While some CNVs enrich the diversity of an organism and play a role in species evolution, CNVs may also be linked to certain diseases such as neurological disorders, early onset obesity, and cancer. CNVs can affect gene expression sometimes leading to disease by direct overlap of the gene or by indirect effects (outside the gene location). Danio rerio (zebrafish) is an excellent model organism for human development as well as disease. Zebrafish share 70% of genetic similarities with humans with 84% of disease associated genes. Additionally, zebrafish genomes contain a large amount of variation with 14.6% of the zebrafish reference genome being variable. This study seeks to compare CNVs, miRNA expression levels, and gene expression levels within the kidney and liver of zebrafish. Array comparative genomic hybridization was used to determine CNV regions in 30 adult Tübingen zebrafish while expression arrays were used to measure gene expression as well as miRNA expression in kidney and liver in these same 30 fish. Single cell RNA (scRNA) sequencing separating genes into their respective kidney and liver-specific cell types will be used to overlay the collected data, so that each gene will be assorted to specific cell types. Expressive quantitative trait loci (eQTL) analysis (linear regression model in R) will then be used to explore how CNVs may affect gene expression and the regulatory role played by miRNAs.

University of Tampa

The Effects of Guardian Death on Development of Personality Disorders.

Lillian Paulitz

Dr. David Cox

Research has shown that environmental factors contribute to the development of forms of psychopathology in adulthood. Particularly, literature has often associated parental separation, such as death, to the development of personality disorders. Moreover, there is a positive correlation between childhood trauma and dark triad personality traits. Drawing on this evidence, we propose investigating the relationship between guardian death during childhood and developing personality disorders, specifically the dark triad, which is a part of cluster B. We will use the The Personality Inventory for DSM-5, otherwise known as the PID-5, the Short Dark Triad, and the Dirty Dozen Scale to assess dark triad traits such as narcissism, machiavellianism, and psychopathy. Central research questions are, "will participants who report death of a guardian during childhood score higher for personality disorders, specifically dark triad traits, compared to participants who didn't report guardian death?" With this question we can investigate if there's a correlation between guardian death during childhood and the development of a personality disorder within the subject. We hope to find a positive correlation between guardian death and personality disorder traits. Deliberation of the risk factors in developing personality disorders is essential to discussing preventive or predictive measures of developing a personality disorder. This can help society by preventing more cases of personality disorders where the individual can be of harm to themselves or others. Considering the relationship between trauma and their contribution to developing personality disorder traits, we can further investigate how death impacts specific aspects of personality disorder development.

Florida Gulf Coast University

From Tools to Teammates: Developing a Trust Framework for Human-AI Collaboration

Lily Hayes & Taina Pimental

Dr. Daniel Griffin

The rise in integrating artificial intelligence (AI) into human teams has sparked concern about its impact on team dynamics. As AI advances in ways beyond simple tools, like ChatGPT, to autonomous agents, understanding the relationship between AI and human collaboration has become critical as we begin viewing AI as effective teammates. Among literature concerning human-AI teams (HATs), we have conceptualized three levels of AI autonomy: tool, assistant, and agent, all of which influence the interaction between human-AI teams differently. We conducted a systematic review of the current state of HAT literature, applying inclusion criteria to 86 articles with 110 individual studies reviewed. Throughout this review, we identified key factors, including team size, task types, levels of AI autonomy, and relevant constructs measured. Trust emerged as the most frequently studied construct, highlighting its central role in HAT dynamics, shaping how AI is perceived and used. Trust development may vary with AI autonomy—agents might build trust through effective decision-making, while tools may do so by reliably completing tasks. Building on this review, we will explore the specific articles that had trust as a construct measured, breaking down how each article operationalized trust in the context of levels of autonomy. We aim to develop a standardized trust framework allowing us to examine the relationship between AI autonomy and trust in human-AI collaboration. This research establishes a general framework for operationalizing trust, guiding future studies on HAT dynamics, and ultimately provides valuable insights for creating successful human-AI teams.

University of South Florida

Developing a DNA-based Molecular Calculator

Lindsay Trent

Dmitry Kolpashchikov

Molecular computing has been proposed as a method to overcome the limitations of electronic devices. Due to the predictability of Watson-Crick base pairing, DNA interactions can be programmed as logic operations, similarly to electronic computers. Advantages of DNA as computing material lies on its compatibility with biological markers, leading to realize smart devices for biomedical and biotechnological purposes. Our project aims to develop a DNA-based calculator, which will perform addition of DNA oligonucleotides as if they were digital numbers. We explored a DNA nanostructure that can sum up to three DNA oligonucleotides. This nanostructure is designed to be a modular DNA calculator that can transition from a half-adder to a full-adder. It uses a logic gate system comprised of specially designed oligonucleotides that fold into a four-way junction. Once the DNA nanostructure is assembled, a DNA strand is introduced as the input to the logic gate system which triggers the folding of the DNA logic gates into four-way junction that can result in two new DNA sequence as output, SUM and CARRY. These outputs are recognized by a molecular beacon probe and translated into a fluorescence readout. To recognize up to three inputs, the logic gates are programmed as switches where the gate with higher binding affinity to the input will process the corresponding SUM or CARRY output. The development of these DNA-based calculators can bring integration of the additive effect of biological markers like DNA and RNA in diseases and cancers where successful treatments are underlined by such molecules.

University of Central Florida

The role of YTHDF1 in regulating neuroinflammation induced by lipopolysaccharide

Linh Nguyen

Dr. Gopal Thinakaran

YTH N6-Methyladenosine (m6A) RNA Binding Protein 1 (YTHDF1) is a classical reader protein that binds to m6A-modified transcripts to regulate their translation , but its role in Alzheimer's Disease (AD) pathophysiology, particularly in neuroinflammation, a key factor of AD, remains poorly understood. Our goal is to explore YTHDF1's role in the context of neuroinflammation and gain molecular insights by employing mouse and cell models. We hypothesize that YTHDF1 modulates lipopolysaccharide (LPS)-induced neuroinflammation both in vivo and in vitro. Control and Ythdf1-/- mice were injected with LPS, then RNA was isolated 6h later after 1 day (acute) or 4 day (chronic LPS challenge) and quantified by RT-qPCR. The result shows that YTHDF1 limits the induction of acute inflammatory response but attenuates chronic inflammation in response to peripheral LPS administration. We further explored the cellular mechanism by knocking out the YTHDF1 in microglia like cell line, C20. Lipid droplets and myelin phagocytosis experiments were applied to cultured YTHDF1 KO and WT cells. Loss of YTHDF1 reduces the myelin phagocytosis function of the cell and there is less

lipid droplets observed compared with WT cells. This observation is extremely relevant because it is becoming evident that failure of immune resolution underlies chronic inflammation and subsequent neurodegeneration in AD. Overall, our findings suggest that YTHDF1 could play essential roles in a LPS induced neuroinflammation model.

University of South Florida

Cuba's Cultural Mosaic: The Impact of Old and New World Influences on Religion and Society

Lisbet vidal

Sonji Nicholas

This project explores how Cuba's lesser-known Indigenous and African roots have shaped its contemporary culture. As a first-generation American descended from two Cuban immigrants, I've always been curious about my roots, especially as history is often erased or forgotten. Living in Florida, where the Latino/Hispanic population is very active, this project allowed me to delve into this particular aspect of my heritage. My research draws from personal experiences, journals, eBooks, and other sources to examine how blending African, European, and indigenous cultural and religious traditions have shaped Cuba's society. It describes the impact of colonialism on the indigenous and Afro-Cuban populations in Cuba, which gave rise to the religions of Santería, Catholicism, and Christianity, all of which continue to shape Cuba's population. Laws that suppressed religious expression also suppressed culture and identity. Through this research, I have come to see that despite these challenges, aspects of Indigenous and African religion and culture have proven to be resilient as they are evident and thriving in contemporary Cuban society. This research has demonstrated how cultural traditions are both retained and erased. It also shows how the influences of the Old and New Worlds continue to shape religion, art, language, and social structures in Cuba and among Cuban communities abroad. Finally, it points out the ongoing cultural dialogue between Cuba and the greater Latino experience in the U.S., where history, culture, and identity continue to shape the future.

Florida SouthWestern State College

Shoot first, ask later": The relevance of the military police in the culture of fear and violence in favelas of Rio de Janeiro.

Livia Guimaraes de Oliveira

Dr. Beatriz Padilla

The militarized policing of Rio de Janeiro's favelas (low-income communities) has long exemplified systemic racial and class oppression in Brazil, perpetuating a "Shoot first, ask later" culture. This study investigates the colonial legacy shaping the violent practices of the military police, focusing on the normalization of brutality and its disproportionate impact on Black and low-income communities. Through a sociological perspective, the research analyzes the role of two public security programs, the pacifying police units (UPP) and the federal military intervention of 2018, highlighting their escalation of violence and failure to reduce crime. Drawing on historical data, case studies, and international comparisons, the paper critiques the institutional mechanism that perpetuates impunity and facilitates systemic human right violations. The findings show the urgent need for racialized and class-based dimensions of state violence, as well as the ineffectiveness of militarized strategies in addressing urban insecurity. Concluding with policy recommendation, this study advocates for demilitarization, institutional accountability, and investment in social development to foster a safer and more equitable society. This work contributes to global discourses on public security reform and human rights in postcolonial urban contexts.

University of South Florida

Personality Traits, Financial Strain, and Stress: Insights into College Student Well-Being

Livia Hertel

Dr. Tiffany Chenneville

Financial strain is a common challenge faced by college students, significantly impacting their academic performance, mental health, and overall well-being. Many students must navigate tuition costs, housing expenses, and limited income while balancing academic and social life. Personality traits have been shown to influence stress perceptions and coping mechanisms, making the interplay between personality, perceived

stress, and financial strain critical for developing targeted interventions and support academic success. Drawing from data from over 600 US college students, the current poster will focus on understanding the link between personality traits and experiences of strain and will address various resources and treatments available to students struggling to cope with financial strain.

University of South Florida

What do Americans think about the death penalty?

Livia Vieira

Dr. Monica Escaleras

The death penalty has long been a controversial topic and a major theme in ethical dilemmas. Because of its contentious nature, I decided to conduct a survey to better understand the American perspective on the death penalty as a form of legal punishment. Additionally, I believed there would be a difference in the levels of support for this form of legal punishment between men and women. To test this, I designed a questionnaire with 17 questions, collected data via Amazon Mechanical Turk, and received 147 completed surveys, which were analyzed using IBM's SPSS. My interest in this disparity was inspired by Hofstede's study of cultural dimensions. According to his theory, men tend to be more assertive and tough, whereas women are generally more nurturing and relationship oriented. Based on these assumptions, I hypothesized that women would be more likely than men to support the death penalty as a punishment for sexual crimes against children and rape crimes. Surprisingly, my research results showed that 14.7% of women opposed the death penalty for sexual crimes against children whereas 4.2% of male respondents opposed the death penalty in this instance. Furthermore, 43.7% of males supported the death penalty as a punishment for rape crimes, while 33.3% of women expressed support. These results were statistically significant differences at the 5% level and contradicted my initial prediction, for they showed that more men than women support the death penalty as a form of legal punishment for rape crimes and sexual crimes against children.

Florida Atlantic University

Documenting Vocal Responses to Adult Song in Wild-Caught Sparrows

Liz Linares

Rindy Anderson

Songbirds, like humans, learn their songs early on by listening to and memorizing adult tunes. Bachman's sparrows are unique among songbirds because mature males sing two types of songs: "primary song" and "complex song." We investigated whether fledgling Bachman's sparrows have a preference for Bachman's sparrow songs over other species, and if they attend to both types equally. We obtained 13 wild nestlings aged 3-5 days and raised them in the lab. We presented audio recordings to the young birds for two hours each morning, including Bachman's sparrow primary songs, complex songs, and songs from two additional songbird species. We recorded the juveniles' vocal responses to song playbacks and recorded the number of subsequent calls. We anticipated a higher vocal response to Bachman's sparrow primary songs compared to complex songs, and a lower reaction to other species songs. We will analyze and compare the vocal responses of juveniles to various audio stimuli using bioacoustics and statistical methods. Documenting the vocal responses of young Bachman's sparrows to acoustic stimuli helps us understand the vocal learning process in songbirds and how their communication systems evolve.

Miami Dade College

No Association Between Changes In Leg Lean Mass and Muscle Strength Following Short-Term Resistance Training Among Older Adults: Preliminary Findings

Logan A. Banks & Vanessa C. Cabrera

Matt S. Stock

Background: Sarcopenia has been defined as the gradual, age-related loss of skeletal muscle mass and strength. High-intensity resistance training is prescribed to prevent or reverse sarcopenia. However, whether improvements in muscle mass and strength are associated remains unclear, particularly following only a few weeks of training. Purpose: We sought to examine whether 6 weeks of supervised resistance training enhanced muscle mass and strength, and to explore whether these

improvements were associated. Methods: Five adults (4 males, 1 female; mean age = 72 years) participated in a training program twice per week for 6 weeks. Exercises included leg extensions, leg press, and trap-bar deadlift using loads equivalent to their 5-repetition maximum (5RM). Before and after the intervention, we assessed leg lean mass, unilateral concentric peak torque and mean power of the quadriceps, 1RM leg extension strength, and 5RM trap-bar deadlift strength. Bivariate correlations were used to examine associations between change scores. Results: The mean change in leg lean mass was 0.28 kg; however, we observed considerable variability, with one participant gaining 0.98 kg and another losing 0.92 kg. Improvements in strength outcomes were meaningful (mean % change = 15.6%), including a 26.4 kg improvement in leg extension 1RM. There were no significant correlations among the change scores ($p \geq 0.687$). Conclusion: Our results show no association between improvements in leg lean mass and strength following 6 weeks of resistance training among older adults, highlighting a dissociation between these outcomes and the multiple mechanistic contributors to maximal strength adaptation.

University of Central Florida

Distribution of Psorospermium haeckeli in South West Florida

Logan Chandler

Dr. Christina Anaya

Psorospermium haeckeli is a microscopic parasite affecting crayfish populations in North America and parts of Europe. Recent research has provided insights into the life cycle of this parasite, which interacts with the crayfish immune system and can pose risks in confined environments like fish farms. In this study, we examined crayfish for P. haeckeli from southern Florida, because no studies have provided data from this region. Our objectives were to determine which body parts are more susceptible to infection, compare infection rates between crayfish sexes, and investigate the relationship between crayfish size and infection rates. We also assessed parasite density across different organs to explore correlations with crayfish size. We examined 45 specimens (25 male, 20 female) collected on the FGCU campus in Fall 2023. These samples were previously dissected, stored at -20˚C, and analyzed for parasite presence and density in stomach, carapace, and tail tissues under a microscope. Tissue was placed on a microscope slide and covered with a cover slip to flatten the tissue. The tissue was then scanned at 20× magnification. We found larger crayfish were more likely to be infected and had higher parasite densities. Male crayfish, on average were larger than females and showed higher infection rates. The tail region exhibited the highest infection rates and parasite densities. Additionally, we observed that the parasites were larger than those typically reported, averaging over 100 micrometers in length. Because P. haeckeli was commonly found on the FGCU campus, future studies should examine its presence throughout Florida.

Florida Gulf Coast University

The Cognitive Abilities of College Students and their Relationship to a Personal Sense of Uniqueness

Logan Denney

Dr. Amanda McGraw

This study examines the relationship between cognitive abilities and personal uniqueness in college students. While prior research highlights the importance of uniqueness in individual identity, its connection to specific cognitive abilities remains underexplored. Young adults represent a population where developing a sense of uniqueness is particularly complex due to significant cognitive and social development. Here, we hypothesize that processing speed, academic achievement, working memory, and social cognition will each predict a greater sense of personal uniqueness. Participants will complete assessments measuring their processing speed, working memory capacity, academic achievement, and social cognitive abilities. Self-reported measures of personal uniqueness will be collected to evaluate the relation between cognitive abilities contribute and personal uniqueness. To address Research Question 1: Does processing speed predict a greater sense of personal uniqueness in adolescents? we will conduct regression analyses with processing speed as the predictor. To address Research Question 2: Does academic achievement predict earlier uniqueness development? we will use academic performance as the predictor. Similar analyses will explore the effects of working memory (Research Question 3) and social cognition (Research Question 4) on personal uniqueness. Age and gender will serve as covariates in all analyses. This study is significant because understanding how cognitive abilities contribute to uniqueness can help individuals recognize and embrace their individual differences. These insights may enhance self-efficacy, foster healthier relationships, and improve mental health outcomes, ultimately creating opportunities for personal and social development.

Jacksonville University

Wireless Data Transmission for Children with Mobility Impairments: Enhancing Rehabilitation Monitoring

Logan Licini & Da'Qwan Fredericks

Dr. Juan Aceros

Power Mobility Devices (PMDs) have become increasingly popular for mitigating the negative effects of limited self-directed exploration in children with mobility impairments. However, current monitoring relies on self-reported feedback from parents or caregivers, which can be biased and unreliable. Caregivers may overestimate or underestimate usage due to stress, fatigue, or anxiety, or feel pressured to report higher usage than actual. This work introduces an unbiased approach to monitoring PMDs. Our system design utilizes the Arduino MKR NB 1500 microcontroller board, which employs Long Term Evolution (LTE) to wirelessly transmit collected data through the Arduino cloud using a hologram SIM card, and then transfers it to Google Sheets for post-processing and analysis. LTE was chosen over other communication protocols like WiFi or Bluetooth due to its longer range and greater stability. The system was benchtop prototyped and tested within a 10-mile radius around Jacksonville. It successfully maintained connection and reliably delivered data to the cloud within our home base. However, dead zones were encountered further away where connection could not be established. In these cases, data was saved internally and transmitted once the device returned to the home base and re-established connection. This testing, conducted over approximately 2 hours, demonstrated the device's capability for long-duration use. The developed system is now being integrated into PMDs and will be tested in an intervention with children.

University of North Florida

Hooked on Sweetness: Testing Light Attraction in Planaria with Alternative Sweeteners

Logan-Marie Torry

Dr. Cassandra Korte

Artificial sweeteners are a common additive to the human diet, with products like Splenda and Equal marketed as healthier alternatives to traditional sugars. These sweeteners that have been examined for their rewarding and withdrawal effects in planarian flatworms. Planarians are photophobic organisms that typically swim away from light. Previous research suggests that planaria can learn through conditioning when exposed to Splenda, Equal, and sucrose in both light and dark environments. This experiment differs as it seeks to test whether planaria can be conditioned to swim towards the light when exposed to alternative sweeteners such as Stevia and a Stevia Splenda blend. It also tests whether these sweeteners have similar rewarding effects and how the chemical contents compare to those in the earlier studies. During the conditioning period, planaria will be exposed to a sweetener in the light for a period of time, followed by a transfer to unsweetened water in the dark for the same time. If the conditioning is successful, the planaria would go against their typical behavior and swim toward the light when given the choice of either dark or light. They would successfully be taught through conditioning to associate the light environment with a rewarding sweetener. Future research questions focus on environmental toxicant effects on positive phototaxic (light-seeking) responses in planaria. ?

Lynn University

Investigation into the correlation between Signal Transducer and Activator of Transcription 3 (STAT3) Pathways and the Development of Glaucoma

Lori Nguyen, Ada Lau, Kadence Relente & Steven Nguyen

Dr. Hector Gomez

Signal transducer and activator of transcription 3 (STAT3) is a transcriptional regulator that plays a role in the control of immunity and inflammation. Glaucoma is the degeneration of retinal ganglion cells due to high intraocular pressure, resulting in vision loss. The objective of this literature review is to consolidate existing studies regarding STAT3 and glaucoma to identify common pathways and cell regulatory processes that respond to glaucomatous injuries. A comprehensive review of 30 peer-reviewed articles with a publication range from 2004 to 2024 was conducted via PubMed, focusing on the terms STAT3, glaucoma, intraocular pressure, retinal ganglion cells, and cell signalling. A study by Wiggs (2015) found that glaucoma can be caused by mutations in proteins regulating cell division, cytokine signaling, and ocular development. STAT3 is a major signaling pathway that is involved in the regulation of cell division and retinal ganglion or axon regeneration. If STAT3 is inactivated in the optic nerve, axon regeneration is inhibited contributing to retinal ganglion cells degenerating. If STAT3 is hyperactivated in the optic nerve, cytokines can become inflamed contributing to increased intraocular pressure. Therefore, the literature suggests a relationship

between the signaling pathway of STAT3 and the pathogenesis of glaucoma. Since glaucoma inhibits crucial cytokines involved with STAT3 pathways, the regenerative and healing properties of STAT3 on retinal ganglion cells are greatly reduced. Future research should be oriented towards further cross-examinations of STAT3's impact on cellular regeneration and degeneration in glaucoma.

University of South Florida

EsperSense: A Monitoring Device for Trimethylaminuria (TMAU)

Lucas Bonassi & Megan Perusse

David Montez

Trimethylaminuria (TMAU) patients face significant social isolation and mental health challenges due to the lack of knowledge and awareness of this disorder, especially within the medical community. TMAU causes strong fishy odors that stem from the inability to oxidize Trimethylamine (TMA), a dietary byproduct. Our human practices team engaged with patients and stakeholders, gathering feedback and personal stories to gain a better understanding of the impacts of TMAU on those who suffer from it. Conversations with patients living with TMAU revealed a shared sense of diminished autonomy experienced by those suffering from the condition. To address this, the FSU iGEM team incorporated direct patient feedback to design a discreet breathalyzer device. The device monitors Trimethylamine levels in real time, helping patients track their symptoms and identify unique patterns related to their diet. This will also provide the opportunity to calculate dosage amounts for therapeutic treatments such as FSU iGEM's 2023 TMAU therapeutic project, empowering patients to manage symptoms effectively. This monitoring device utilizes a BioFET with a bacterial Trimethylamine Monooxygenase (TMM) as the receptor. The research conducted builds on collaborations with sufferers, researchers, and healthcare professionals to spread awareness, improve quality of life, and give those living with TMAU more control over their symptoms and lives.

Florida State University

Behind the Screen: How Personalized Ads Shape Your Social Media Experience

Luisa Lucigniani

Monica Escaleras

In today's fast-paced digital world, companies are constantly striving to capture attention through personalized and generalized forms of advertising. As we dive deeper into the social media era, understanding people's perspectives on these approaches has never been more crucial. Specifically, I'm interested in studying Americans' views on the privacy concerns and user experience of personalized advertisements. Prior to this study, I had hypothesized that female respondents would have a higher frequency of encountering personalized advertisements compared to males, and that female respondents would also purchase from personalized ads more often than males. In order to test the hypotheses, I wrote a 16-question survey and used the platform Amazon mturk to collect 228 completed surveys. I then used IBM's SPSS to analyze the results. Interestingly, the results from the survey yielded some unexpected and significant insights. While I expected that females would be presented with more personalized ads than males which was found to support my hypothesis, it was surprising that my second hypothesis was contradicted by the data showing that males actually purchased statistically more than females at the one percent level of significance. For companies, this finding could implicate a shift in marketing strategies, potentially redirecting their focus towards male consumers in order to maximize profitability.

Florida Atlantic University

After the storm: protecting the integrity of clinical research data against future natural disasters

Luis-Francisco Guevara & Bryan Robleto

James McHale

2024's unprecedented hurricanes caused widespread destruction throughout Tampa Bay, flooding USF's Family Study Center (FSC) on its St. Peterburg campus. The FSC has served Pinellas County for over 20 years, providing direct clinical service and innovative community-based research. Many FSC programs, sponsored by federal, state, and local funders, enroll lower socioeconomic and underrepresented groups. The process of obtaining consent and survey data from underserved parents and families necessarily differs from higher-tech device-based data collection of many agencies. Data from the FSC's community clinic, the Infant-Family Center, and a major federal project "Figuring It Out for the Child", existed entirely in paper form in locked file cabinets. Water seepage contaminated paper files beyond repair; though most survey data survived as electronic scores in computer databases, original consent forms were saturated, became hazardous waste, and had to be securely disposed of. In this report, we detail the process of

reporting damage to funders, healthcare agencies and USF's IRB, and creation of a Corrective and Preventive Action Plan, the focus of this report. We detail a new system in the Research and Electronic Data Capture platform. Consent forms are stored electronically, data and clinical notes are uploaded in paper form, and videorecordings are stored securely with families' data files. The FSC has archived existing historical data and initiated a new system of handling and safeguarding paper and video files, protecting against future natural disasters. Plan details and lessons learned that can benefit other researchers using paper files for clinical/research studies will be outlined.

University of South Florida

Effects of two substrates on the growth and development of an endangered cactus

Luke McCall & Thomas Laura

Anthony Rossi

Consolea corallicola, previously classified as Opuntia corallicola, is a critically endangered cactus endemic to the Florida Keys, specifically Little Torch Key and Swan Key. Efforts are being made to establish new colonies in other locations. The primary contributor to this cactus's decline in the wild has been the invasive cactus specialist moth Cactoblastis cactorum. The primary objective of our experiment was to determine the effects of two substrates (sand and a 1:1 ratio of sand and peat) on the growth and development of C. corallicola. After the experiment's conclusion, analysis of variance and correlation analysis were used to analyze the data. The cacti in the sand and peat mixture grew approximately 190% over the course of the experiment, which is significantly greater than the growth exhibited by the cacti in pure sand (approximately 60% growth). This has many implications for determining the ideal habitat to initiate future outplantings of C. corallicola in the wild.

University of North Florida

Utilizing Engineered Base Editors to Target Therapeutically Relevant Sites

Madeline Sheppard

Dr. Whitney Bullock

The Gap Junction Beta 2 (GJB2) gene is the most common genetic cause for hearing loss worldwide, and is responsible for up to 50% of nonsyndromic deafness. While GJB2 has many disease-causing mutations, three alleles account for 75% of variants, two of which are theoretically targetable by base editors. The advent of high throughput sequencing, engineered enzymes, and the discovery of multiple Cas enzymes have accelerated the field of genome editing, leading the development of precision editing techniques, such as base editors. In this study, we created a model cell line with the most common missense pathogenic mutation of the GJB2 gene, V37I, using cytosine base editors. This endogenous cell line created containing the V37I mutation will be a model on which to test potential base editors in vivo to develop novel therapeutics to treat GJB2-related deafness. A cytosine base editor and Cas enzyme engineered to have a relaxed PAM has been paired with multiple deaminases to test what enzyme/deaminase combination will work most effectively to target these different pathogenic mutations. We identified three effective guide RNAs that resulted in between 30 and 40% editing, which is comparable to other base editing targets. The final guide RNA selected exhibited approximately 35% editing and fewer than 15% of cells had bystander editing at nearby sites. This enzyme, SpRY, and other engineered SpRY mutants, will be able to target pathogenic mutations via a gRNA more easily that WT Cas9, enabling base editing to previously inaccessible sites.

Eckerd College

Belonging and Engagement in the College Classroom: The Role of Course Modality

Madison Choice

Dr. Amy Osmon

Virtually all college students interact with digital tools as part of their coursework, and many take courses that are fully online. Previous research into students' need for social interaction has found that in-person courses contribute to higher senses of personal belonging and academic engagement than online courses (Nguyen et al., 2021; Chauhan & Jain, 2024). The present study relates Daytona State College students' belonging and engagement levels within peer discussions to their chosen class modalities. The researchers surveyed 69 students using an anonymous Likert scale questionnaire; the engagement scale questions were derived from the Student Engagement in Schools Questionnaire (Hart et al., 2011), and the belonging scale questions were modified from the Sense of Social Fit questionnaire (Walton & Cohen, 2007). The survey results showed a statistically significant difference between engagement in discussions for online students and for in-person students. No

significant relationship was found between course modality and levels of belonging. While the study was limited by sample size and the construction of the survey questions, online students' greater engagement in discussions suggests that digital discussion boards may have more utility than previously assumed. Further research may benefit from sampling at multiple colleges and from improving the accuracy of questionnaires.

Daytona State College

Regenerative Potential of Cannabidiol in Chemically Ablated Olfactory Epithelium

Madison Klick

Dr. Debra Fadool

Olfactory sensory neurons (OSNs), essential for odor detection, regenerate approximately every 30 days, beginning as basal cells that mature into OSNs. Methimazole (MeZ), used clinically for hyperthyroidism, can ablate OSNs, creating a model for studying neurogenesis. Cannabidiol (CBD), a non-psychoactive Cannabis component, is known to promote neurogenic cell proliferation, though its impact on OSN regeneration remains unexplored. This study evaluates whether CBD supports OSN regeneration and functional recovery in a chemically ablated olfactory model. Animals were trained to self-administer CBD or only the jam vehicle that was chronically administered until euthanasia. Baseline olfactory function was assessed with a hidden cookie behavioral assay. After baseline testing, a single MeZ injection (75 mg/kg) or saline was administered. Behavioral tests resumed on days 1-6, 9, 12, and 28 post-injection to monitor olfactory recovery. At selected time points, histological analysis was performed to quantify OSN regeneration. CBD did not alter retrieval times in olfactory tasks or the number of OMP+ OSNs at 10 or 30 days post-injection. CBD did, however, increase the main olfactory epithelium (OE) thickness at 10 days, an effect absent at 30 days. Additionally, no significant differences were observed in OSN maturity across groups. These findings suggest minimal influence of CBD on OE structure, with no substantial effect on mature OSNs or olfactory function.

Florida State University

Examining Organizational Capacity Pre/ Post Implementation of Evidence-Based Interventions to Increase Adolescent Human Papillomavirus (HPV) Vaccination: Preliminary Results from the HPV MISTICS Trial

Madison Matos

Dr.Susan Vadaparampil

The HPV MISTICS intervention is a stepped wedged randomized trial testing effectiveness and implementation outcomes of multi-level evidence-based interventions to increase adolescent HPV vaccination across 8 health centers in Florida. Organizational capacity was measured to understand participating centers' ability to implement HPV vaccine promotion strategies. This abstract describes organizational capacity across 4 centers prior to and after the active intervention implementation period. Vaccine Champions at each center completed electronic pre and post implementation surveys assessing center characteristics, data systems, and vaccination policies and practices. Baseline (n=4) and follow up data (n=3) from wave 1 centers are presented. Most organizational characteristics remained unchanged from baseline to follow up (e.g., type of setting). Regarding data systems, at baseline, centers reported their electronic health record (EHR) automatically determined immunizations due at each patient visit (n=4), and the EHR identified patients who had an appointment but did not receive the HPV vaccine (n=2). At follow up, all centers reported tracking overdue immunizations, and one center began tracking their missed opportunities for vaccination. Regarding HPV vaccine policies and practices, at pre and post survey, centers reported policies that allowed adolescent HPV vaccinations at all visits, such as pre-scheduling patients' next vaccine visit, vaccine-only appointments to increase series completion, and continued recommendation of the vaccine after parents declined. Findings identified organizational capacity characteristics which facilitate strategic planning for maintenance and sustainability of HPV vaccine promotion strategies at each center. Future steps include examining the relation between centers' performance on HPV vaccination rates and organizational capacity characteristics.

University of South Florida

Mathematical Problem Solving for Students with Disabilities

Madison Zelner

Dr. Jenny Root

This project aims to work with teachers of children with disabilities in an effort to improve their mathematical skills. The strategy being used is Modified Schema Based Instruction (MSBI) which is an instructional strategy that helps students to identify key information from word problems to a schema (diagram) while also completing a series of steps to help in solving the mathematical word problem. This study works with teachers in middle school to examine how their students will respond to this systematic way of teaching a specific mathematical topic. The results of the study will vary as all disabilities can affect the way that a student learns very differently. There are weekly meetings with the teachers to evaluate teacher implementation, student progression, and make any necessary changes to the curriculum. However, there does seem to be a positive association between the number of correct answers on mathematical word problems given by the student after the implementation of the MSBI strategy. The conclusion that can be drawn is that the systematic methods of using steps to teach new mathematical topics leads to a more proficient understanding of the topic and a greater ability to answer these questions correctly. By teaching students to break a mathematical word problem into a series of attainable steps, that each need to be checked off, students are then able to repeat these steps faster and without careful guidance.

Florida State University

Making Predictions of Bacterial Population Dynamics Using a Metropolis-Hastings Algorithm

Mahathi Tallapragada

Susan Rogowski

The logistic growth model is a simple representation of bacteria population dynamics. In this project, we are interested in estimating the growth rate and the carrying capacity of our model, which serve as the parameters of the model. While we can estimate the growth rate of a bacterial population using the logistic growth model, there is often noisy or sparse data that distracts the model from an accurate representation of the parameters. The Markov Chain Monte Carlo (MCMC) - Metropolis-Hastings algorithm allows for the growth rate and carrying capacity to be approximated depending on an initial distribution. By creating a working code for the MCMC Metropolis-Hastings algorithm, we can estimate the parameters of the model through numerous iterations and show a reasonable trend in population growth. Through the code, we show that while the algorithm works well and can recover the parameters, it is very computationally expensive. In the future, the algorithm must be further improved to reduce the computational costs of running, creating a faster and more efficient solver. Additionally, we will show how the algorithm can be applied to more complex bacteria population models.

Florida State University

Development of Value Sets to Study Immune-Related Adverse Events in Cancer Therapy

Prerana Patibandla & Roy Chen

Dr. Christina Eldredge

Among the nearly 2 million new cancer patients, patients treated with immune therapy are at higher risk of immune-related adverse events (IRAEs) and require improved severity monitoring. Many of these IRAEs may be captured using NCI's Common Terminology Criteria for Adverse Events (CTCAE), which classifies clinical trial adverse events based on the division of body systems. CTCAE's specificity in grading is advantageous for assessing IRAE severity. To expand CTCAE usage beyond research, this study aims to develop a value set based on CTCAE v5 terminology to monitor IRAEs at the population level using clinical administrative data. To accomplish this, two coders used a previously developed decision tree (Phuel, 2023) to map CTCAE codes to ICD-10 codes. Preliminary findings examined 34 CTCAE codes (terms and severity grades). 73.5% of the terms were found to have corresponding matching codes in ICD-10. The largest gaps were discovered in severity grade 4, which focuses on life-threatening conditions. In the second and third grades of cytokine release syndrome, and serum sickness, ICD-10 struggled to specify the severity of hypoxia and arthralgia. This resulted in loss of specificity when transitioning from CTCAE to ICD-10 since grades 2 and 3 would require merging. In the future, this research seeks to explore ICD-11's potential to improve severity coding for IRAEs, especially with ICD-11's 20% increase in usable codes compared to ICD-10. This will enhance clinical documentation and treatment management for cancer patients undergoing immune therapy.

University of South Florida

Development of Impedance Biosensor with an Increased Chemically Reactive Surface Area using Gold Nanoparticle-Coated Cellulose Nanofibers

Rahela Dolha

Dr. Foram Madiyar

Inflammation is a prevalent and persistent symptom associated with various chronic illnesses. Rapid monitoring and management of inflammation using point-of-care (POC) biosensors can significantly enhance the quality of life for individuals struggling with inflammation. Interleukin-6 is a well-established biomarker of inflammation and is used in this study as it is released during the early stages of inflammation as an immune response and persists in the blood stream/sweat, allowing for early and continuous monitoring of a patient's inflammation. This proposal focuses on the development of an impedance biosensor, modified at the working electrode tip with gold nanoparticle (AuNP)-coated nanocellulose fibers (CNF), for the monitoring of interleukin-6 antigen concentrations as a method of inflammation monitoring. The biosensor is constructed with a multi-layered approach: the working electrode is first layered with AuNP-coated CNF, followed by a polymer-protein cross-linker, and finally immobilized with interleukin-6 antigens. The channel of the biosensor with be exposed to a saline solution of interleukin-6 antibodies that will bind with the antigens, increasing the impedance of the system. Impedance measurements are recorded using Bode 100 analyzer and displayed in Bode and Nyquist plots. The detection and sensitivity limits of the biosensor are derived from these plots to evaluate the biosensor's performance. The inclusion of CNF creates a complex network that significantly increases the chemically reactive surface area compared to biosensors with only AuNP bases, thereby improving the sensitivity and accuracy of the AuNP-coated CNF-modified biosensor.

Embry-Riddle Aeronautical University

Genetic Factors Controlling Pathologies Across the ALS-FTD Spectrum of Disorders

Roy Chen & Ramzia Sorathia

Dr. Stuart R Maudsley

Neurological conditions severely harm patients' abilities to move and think. Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD) are two debilitating neurodegenerative disorders that share significant etiological similarities. ALS primarily affects the spinal cord's motor neurons, while FTD damages the frontal and temporal lobes. While the two neurological conditions were initially diagnosed separately, contemporary studies discovered a disease continuum between ALS and FTD: the ALS-FTD continuum. This systematic review re-examined the ALS-FTD continuum's genetic factors, especially potential factors for genetic anticipation. A search was performed on PubMed and EMBASE using "amyotrophic lateral sclerosis," "frontotemporal dementia," "genetic anticipation," and their medical subject headings (MeSH). After yielding 48 results, this review included 26 English, peer-reviewed original articles published between 2014 and 2024; it excluded review articles and studies that focus on other conditions. This study identified C9orf72's GGGGCC expansion in its introns as the most frequent genetic cause of ALS and FTD. Despite its elusive effects, this mutation was found to downregulate C9orf72's expression and alter the immune response, leading to lymphadenopathy and splenomegaly. Moreover, C9orf72 mutation has mixed results for inducing genetic anticipation. The risks of carrying C9orf72 are affected by single nucleotide polymorphisms. Namely, rs139185008 increased the risks of frontotemporal lobar degeneration by 4.38 times and the risks of carrying C9orf72 by nearly 40 times. Overall, C9orf72 holds significant promise for research into its potential role in genetic anticipation. Other genetic factors of the ALS-FTD continuum, including TDP-43, TBK-1, and OPTN, also deserve further investigation.

University of South Florida

Poster Session IV – Abstracts

Balancing Nature's Rights and Human Needs: Evaluating Ecuador's PachaMama Law and Its Potential Application in U.S. Conservation

Rylie Brooker

Dr. Mintoo Patel

The PachaMama Law, enacted in Ecuador in 2008, represents a pioneering legal framework granting ecosystems legal standing to protect nature from degradation. Rooted in indigenous concepts of living harmoniously with the environment, the law addresses pressing issues such as industrialization, deforestation, and climate change. However, its strict implementation has faced criticism for hindering economic activities like mining, agriculture, and job creation. Additionally, low-income and tribal communities reliant on natural resources struggle with the law's impact on their livelihoods. This research evaluates the multifaceted effects of the PachaMama Law on conservation in South America while exploring its potential applicability in the United States. By comparing the environmental, legal, and cultural contexts of Ecuador and the U.S., the study examines whether such a framework could offer a more effective alternative to traditional environmental laws. It highlights the benefits of enhanced biodiversity protection while addressing the economic and social challenges posed by strict regulations. Ultimately, while the PachaMama Law may not suit the general U.S. landscape due to its broad economic and cultural implications, its principles could effectively support conservation in targeted areas like national parks or federally protected lands, where nature's rights could complement existing preservation efforts without disrupting wider societal needs.

South Florida State College

Oral Microbiome Dysbiosis as a Mechanistic and Socio-Cultural Driver of Metabolic Dysfunction

Sammi Rather

Dr. Mintoo Patel

The oral microbiome plays a crucial role in systemic health, with emerging evidence linking oral microbial dysbiosis to metabolic dysfunction, particularly obesity. Dysbiosis in the oral microbiome may contribute to insulin resistance, chronic inflammation, and disruptions in adipogenesis and appetite regulation. Using whole genome sequencing and metagenomic analysis, we characterized the microbiome from tongue coating biofilm samples collected from four healthy young individuals. Additionally, a meta-analysis was also performed following literature review. We investigated how diet, particularly high in sugars and fats, fosters the growth of harmful bacteria such as Streptococcus mutans, Porphyromonas gingivalis, Prevotella, and Fusobacterium, leading to oral dysbiosis and metabolic imbalance. Additionally, we examined the role of sociocultural determinants, including access to healthcare and nutrition, in exacerbating microbial imbalances. Preliminary results suggest that harmful bacteria may predict dysbiosis, and that a healthy diet can help mitigate these effects. Socioeconomic factors were found to disproportionately affect vulnerable populations, increasing the risk of obesity. Our study underscores the potential of the oral microbiome as a therapeutic target for obesity prevention and highlights the need for improved dietary habits and healthcare access, in nutritiously misguided communities like the United States. This project is supported in part by grant in aid of research from the Florida Endowment for the Sciences of the Florida Academy of Sciences.

South Florida State College

Domain knowledge synthesis for AI-based predictive modeling in rice cultivation

Emalynn Tobias

Navi Gill

As the population increases and global temperatures are on the rise, farmers are facing an agricultural crisis. It is, therefore, critical that today's agricultural practices are efficient, reliable, and sustainable. Rice, the foundation of the international diet, is negatively impacted by heat stress resulting in poor grain quality and declined yield. Research has pointed to Artificial Intelligence (AI) as a plausible solution to lessen the threat of food insecurity by implementing AI-based predictive modeling in the cultivation of rice. Precision Agriculture is the practice of agriculture using AI such as automation and predictive analytics to increase crop production and facilitate disease detection and diagnostics. This study compiles

and curates a comprehensive and exhaustive list of features that will synthesize domain knowledge to facilitate predictive model development. These features include but are not limited to the availability of heterogeneous datasets such as phenotypic and genotypic data, data on agronomic practices, multi-omics data integration, epigenetic modifications, regulatory elements, Gene Regulatory Networks (GRNs) etc. This will help in feature engineering, data transformation and guide questions on the cost-benefit assessment of each added feature, with the objective to develop predictive algorithms with enhanced accuracy and applicability in agriculture. Additionally, AI coupled with the state-of-the-art genomics and sequencing technologies enables a well-informed choice of algorithm for predictive modeling of agricultural data. This allows the models to make informed and effective decisions about agricultural processes, such as gene regulation, yield prediction, forecasting of pest infestation, irrigation needs, and disease detection.

Nova Southeastern University

Investigating the Effect of Vitamin D on Host-Pathogen Co-Evolution

Jessica Olivera

Dr. Janna Fierst

In Caenorhabditis elegans, diet affects their ability to clear infection. This study will examine the effect of Vitamin D on host-parasite co-evolution with the model organism Caenorhabditis elegans, and pathogen Pseudomonas aeruginosa. This proposed study will improve our understanding of the evolution of immune response and virulence and will lay the foundation for immunological studies to follow. A longevity assay will be conducted to examine the change in lifespan when Vitamin D is incorporated into the regular OP50 bacterial diet of C. elegans. Survival and fitness assays will be conducted to determine how Vitamin D affects the ability of C. elegans to survive, resist infection, and pass down genes to following generations. Host resistance will be compared to non-Vitamin D treated C. elegans which will remain a regular OP50 bacterial diet. Though prior research on host-parasite co-evolution in C. elegans has been conducted, the effect of vitamins in host-parasite co-evolution currently remains untested. This project aims to use experimental evolution as a tool to understand the consequence of a host's diet on the evolution of a host's susceptibility to infection and the evolution of a pathogen's virulence. The results of this study will provide insight into a pathogen's response to a change in diet of a host from a generational dietary pattern to a newly adapted diet. This study will provide insightful knowledge on the effects of increased Vitamin D doses when faced with a pathogenic infection.

Florida International University

The Relationship Between Cadmium Exposure and Cancer Due to Epitranscriptomic Mechanisms

Karla Evangelista De La Rosa & Joshua Diaz

Dr. Narasaiah Kolliputi

Cadmium is a naturally occurring toxic heavy metal that is a widespread contaminant often produced as a byproduct of industrial processes. Previous studies have linked cadmium to certain post-transcriptional RNA modifications, known as epitranscriptomics. The purpose of this literature review is to shine a light on how cadmium exposure affects m6A methylation and highlights specific epitranscriptomic mechanisms by which cadmium may contribute to the development of specific cancers. 50 peer-reviewed articles were obtained using PubMed and Google Scholar, utilizing the keywords "cadmium exposure", "epitranscriptomics", and "m6A pathways", 20 of which were used as the basis of this review. Studies showed cadmium exposure has led to reduced levels of m6A writers (like METTL3) and erasers (such as FTO) by inducing oxidative stress, which can disrupt normal enzyme function. This interference can lead to abnormal m6A levels on RNA, impacting the stability and translation of key mRNAs involved in cellular processes. Specifically, m6A modifications play various roles in the development of cancer cells through transcription levels by modulating its m6A enrichment. By altering m6A regulation, cadmium may contribute to abnormal cell growth and cancer by disrupting normal gene regulation. These findings suggest several important implications regarding the mechanisms by which cadmium exposure contributes to cancer development. However, there are limited studies regarding this subject. Future studies could possibly deepen our understanding of the relationship between cadmium exposure and epitranscriptomic mechanisms that may contribute to cancer.

University of South Florida

Physiological Effects of Autistic Masking in High Functioning Adults

Lillian Paulitz & Megan Kaiser

Dr. Joanna Salapska-Gelleri

Autism spectrum disorder (ASD) is characterized by struggles with social communication, restricted interests, and repetitive behavior (American Psychiatric Association [APA], 2022); however, these struggles are not always noticeable. One might purposely hide these struggles in order to fit into a neurotypical society. Autistic individuals can achieve this through masking. Masking is the conscious or unconscious suppression of autistic traits to make oneself appear not autistic in social situations (Cremone et al., 2023). We propose investigating the physiological and behavioral effects of masking in high functioning autistic adults, specifically in the FGCU community. We want to investigate the psychological stress responses of masking in high functioning autistic adults. We will use the Autism Quotient (AQ; Baron-Cohen et al., 2001), Ritvo Autism Asperger Diagnostic Scale Revised (RAADS-14; Eriksson et al., 2013), and Camouflaging Autistic Traits Questionnaire (CAT-Q; Hull et al., 2019) to evaluate autistic traits. We predict that participants scoring higher for autistic traits, will show more physiological effects during masking relative to participants scoring lower for autistic traits as measured by an eye tracking, heart rate monitor, and galvanic skin response assessment. Masking in ASD is often overlooked and can lead to a misdiagnosis, so this study will inform if masking is an important aspect of autism, specifically with high-functioning autistic adults, and may contribute further to why behavioral masking should be included in ASD diagnostic criteria.

Florida Gulf Coast University

Enhancing Voter Equity in Volusia County through Vote by Mail Enrollment and Reenrollment Research and Initiatives

Mahogony Jules

Dr. McCoy

This research is dedicated to enhancing voter equity in Volusia County by focusing on improving Vote by Mail (VBM) enrollment procedures. The primary objective is to increase voter participation by identifying and addressing barriers to VBM enrollment and re enrollment through a multifaceted approach, including data analysis, community engagement, and educational initiatives. The study delves into historical and socioeconomic factors influencing VBM participation, with a focus on developing targeted outreach programs for underrepresented groups such as minorities, low-income individuals, and those facing logistical challenges. By evaluating existing voter education programs, the research aims to create customized educational materials that resonate with the diverse population of Volusia County.

Furthermore, the project underscores the importance of maintaining accurate voter registries and seeks to simplify the re enrollment process. The overarching goal is to promote a more inclusive democracy by ensuring that all eligible residents possess the necessary information and resources to participate in the electoral process. The outcomes and strategies generated from this research are intended to serve as a model for enhancing voter equity and engagement in other regions across the nation facing similar challenges.

Bethune-Cookman University

Hearing the Unheard: Understanding the Lived Religious Experiences of Queer LDS Women in Utah

Maiya Johnson

Dr. Joseph Hellweg

The Church of Jesus Christ of Latter-Day Saints (LDSC or Mormons) deems homosexuality morally transgressive and socially unacceptable. Mormon theology is grounded in gendered heterocentric principles, specifically, the requirement of heterosexual marriage to achieve "eternal exaltation." The Church typically centers its concerns with homosexuality on men, relegating queer LDS women and individuals assigned female at birth (AFAB) to a presumed state of compulsory heterosexuality and normative femininity. Therefore, queer LDS women are forced further into the margins, leaving them mostly overlooked and unheard. I aim to give queer LDS women a platform to vocalize how their experiences demonstrate the marginalization of female queerness in Mormonism. This study documents the lived religious experiences of queer LDS women and AFAB persons in Utah. It examines how such individuals orient themselves and their sexual identities within a religious culture that rejects them. My study also explores how queer LDS women categorize themselves in relation to the LDSC and how they respond and cope with their Mormon identity and experiences based on their self-categorization. I conducted open-ended, semi-structured, focused life-history interviews with queer LDS women

and AFAB persons over six weeks during summer 2024. These interviews enabled participants to reflect on their religious experiences and explain how anti-queer LDS theology and doctrine have directly impacted their lives and self-perceptions. They narrated the challenges of navigating their relationship with Mormonism and how living in a dense Mormon region often negatively impacts their daily lives through culture and politics.

Florida State University

Uncovering the Pharmacogenetics of Ticagrelor, a Potent Inhibitor of Platelet Aggregation

Makenna Myrick

Dr. Larisa Cavallari

Ticagrelor is a novel oral P2Y12 receptor inhibitor commonly prescribed to reduce thrombotic events in patients who have experienced a major adverse cardiac event (MACE). Compared to its alternative, clopidogrel, ticagrelor demonstrates more potent and consistent inhibition of platelet aggregation. However, its clinical use is associated with a higher incidence of adverse effects, including dyspnea and hemorrhagic events, which may outweigh its pharmacodynamic advantages in some patients. The variability in bleeding risk observed among ticagrelor-treated patients suggests a potential genetic predisposition that remains poorly understood. This study examines the relationship between the CYP3A4*22 gene variant, associated with reduced drug metabolism, and the incidence of hemorrhagic events in patients treated with ticagrelor versus clopidogrel. A total of 945 patients (n=405 ticagrelor; n=540 clopidogrel) were included, with demographic data and bleeding events, classified by GUSTO criteria, extracted from electronic health records. DNA isolated from intravenous blood samples underwent single nucleotide polymorphism (SNP) analysis using a CYP3A4*22 TaqMan probe to determine allelic frequencies. Given the low number of clinically significant bleeding events reported in both groups, we hypothesize a strong correlation between minor allelic frequency and increased hemorrhagic risk in patients treated with ticagrelor. A confirmed correlation of hemorrhagic side effects and genetic variants could validate ticagrelor as the primary choice for P2Y12 inhibition; therefore providing patients of all backgrounds with a more effective means of stroke and heart attack prevention.

University of Florida

Cognitive and Physiological Moderators of Anxiety's Impact on Adaptive Functioning in Young Adults

Makenzie Kennedy

Dr. Jeffrey Cassisi

Anxiety is a prevalent mental health challenge in young adults, often impairing adaptive functioning across all domains. This study investigates how cognitive and physiological factors moderate the relationship between anxiety and adaptive functioning in a large undergraduate sample. Specifically, the research explores how cognitive flexibility and self-reported physiological symptoms interact to influence adaptive functioning outcomes. Key measures include the Patient-Reported Outcomes Measurement Information System Anxiety Short Form (PROMIS-Anxiety), State-Trait Anxiety Inventory (STAI), Generalized Anxiety Disorder Scale (GAD-7), World Health Organization Disability Assessment Schedule (WHODAS), Cohen-Hoberman Inventory of Physical Symptoms, Composite Autonomic Symptom Score (COMPASS-31), Comprehensive Assessment of Acceptance and Commitment Therapy (COMPACT-23), and the Attentive Response Scale (ARS). Hypotheses propose that anxiety significantly predicts decreased adaptive functioning and increased health complaints. Cognitive flexibility is anticipated to attenuate these negative impacts, while higher physiological symptoms are expected to exacerbate the adverse effects of anxiety. Furthermore, an interaction between cognitive flexibility and physiological symptoms is hypothesized to moderate anxiety's impact on adaptive functioning. Anticipated findings suggest that autonomic arousal symptoms will correlate with lower adaptive functioning and heightened anxiety. Conversely, greater psychological flexibility is expected to promote better functioning and lower anxiety levels. These results have implications for tailored interventions targeting cognitive and physiological pathways to enhance coping strategies in young adults facing anxiety. By integrating multidimensional measures, this study highlights the nuanced mechanisms linking anxiety to adaptive functioning, offering insights for both researchers and clinicians.

University of Central Florida

The Estrous Cycle Phase Influences Exercise Capacity Without Altering Dehydration in Mice During an Exertional Heat Stroke Protocol

Malaica Ashley

Orlando Laitano

Exertional heat stroke (EHS) involves central nervous system dysfunction due to hypothermia from physical exertion in hot environments. In females, hormonal fluctuations during the estrous cycle (EC), estradiol predominating in estrus and progesterone in diestrus, may influence thermoregulation, body mass (BM), and water retention, potentially affecting EHS susceptibility. We evaluated whether mice EC phase (estrus or diestrus) influences BM during an EHS protocol, and the relationship between BM changes, total time of exercise (TTE), and core temperature (Tc).

Adult female mice (estrus: n=35, diestrus: n=22) were implanted with telemetry sensors for Tc. Thirty days post-implantation, mice underwent an EHS protocol with running wheel exercise in a 37.5˚C, 40% humidity chamber, starting at 2.5 m/min and increasing by 0.3 m/min every 10 minutes until loss of consciousness.

TTE was higher in estrus (3.22 ± 0.57h) than diestrus, (2.82 ± 0.75h, p=0.02). BM decreased after EHS for mice in estrus (-2.75 ± 0.66g, p<0.0001) and diestrus (-2.48 ± 0.54g, p<0.0001), but was not different between phases (p=0.17). The percentage of BM reduction was not different between estrus (11.0 ± 2.7%) or diestrus (9.8 ± 2.1%, p=0.11). BM variation (r=0.65, p<0.0001) and percentage reduction (r=0.64, p<0.0001) positively correlated with TTE and inversely correlated with rate of Tc increase (r=-0.61, p<0.0001). BM variation was unrelated to final Tc (p=0.17) and change in Tc (p=0.48).

EC phases influence EHS susceptibility in female mice, with longer exercise tolerance during estrus than diestrus. While significant body mass reductions occurred in both phases, these changes were not phase-dependent.

University of Florida

Morphometric Analysis of the Human Jaw Through Time

Marco Boscolo & Carmela Martinez

Anna Ragni

Understanding the evolution of mandibular morphology provides key insights into the interplay between diet, technology, and human adaptation. Ancient human mandibles were typically larger and more robust, reflecting the mechanical demands of tougher diets. In contrast, more recent mandibles are smaller and less robust due to dietary shifts and technological advancements, which have reduced masticatory demands. Very few studies, however, have quantified the differences between ancient and present-day mandibles, which may be particularly gracile due to ultra-processed foods in the contemporary diet. In this study, we compare mandibular morphology of contemporary Floridian populations and agricultural populations from Sudan 350 BCE-350 CE to explore how changes in diet and lifestyle influence jaw shape. We hypothesize these two groups will have significantly different mandibular shape, with the ancient agricultural population exhibiting greater overall robustness and larger muscle attachment sites than the modern Floridian population. To test this hypothesis, mandibles will be 3D scanned and compared using geometric morphometrics quantitative methods. Comparative analysis will be focused on indicators of shape, thickness, and masticatory muscle attachment sites. We expect to find support for our hypothesis, showing that softer, processed diets in modern contexts require less chewing effort, resulting in less mechanical demands on the jaw, and ultimately shaping morphology over time. This study will highlight the role of dietary and technological shifts in shaping mandibular evolution and the functional pressures that contributed to the modern human jaw's smaller, less robust morphology. Understanding these evolutionary changes has broader implications for studying craniofacial adaptation.

University of Tampa

Hostile or Non-Hostile: The Impact of Attributional Ambiguity on African Americans' Spontaneous Impressions and Mental Health

Margherita Pallanti

Irmak Olcaysoy Okten

Marginalized racial groups may attribute negative feedback from White people to prejudice toward their racial group (Crocker et al., 1991) and positive feedback to motives of appearing non-prejudiced (Major et al., 2016). We will assess whether such attributions affect Black people's spontaneous impressions of White people and their mental health in interracial interactions. We will examine Black participants' attributions of White people's negative feedback on their friendship potential, manipulating the visibility of participants' race to an ostensible White partner (camera on or off). Then, we will test spontaneous impressions via a

false recognition task where participants review White or Black targets' ambiguous behaviors towards them. We will explore the effect of race visibility on spontaneous impressions, predicting that hostile impressions (e.g., mean vs. playful) from White peoples' ambiguous behaviors would be most likely in the face of negative feedback when participants' race is visible (vs. not). We will also explore whether spontaneous hostile impressions predict participants' mental health and self-esteem. The current study will have numerous implications in the field of both social and clinical psychology, highlighting the importance of perceived discrimination in interracial interactions between White and Black Americans, and outlining its negative impacts on Black Americans' mental health. By recruiting only Black American participants, this study will be extremely beneficial to better understand how minority groups directly perceive discrimination with the aim of finding evidence of minority stress and possible interventions to support and improve Black Americans' psychological well-being.

Florida State University

Navigating Truth and Deception: Detectable vs. Deniable Lies in Individual Decision-Making

Maria A. Fernandez

Jose Lopez

This study investigates detectable and deniable lies in individual decision-making, building on prior research exploring these behaviors in strategic settings. Detectable lies can be definitively disproven when the true state is revealed, while deniable lies remain ambiguous and unverifiable. The research aims to understand whether individuals show a stronger aversion to detectable lies, influenced by the psychological "certainty effect," where the fear of being caught outweighs mere suspicion.

To examine this, we designed an experiment using a variation of the die-roll task. Participants are assigned folders containing values with varying observability—some folders make lying detectable, while others allow deniable lies. Real monetary incentives motivate participants to truthfully report outcomes or strategically lie, creating a realistic decision-making environment with tangible consequences. This approach highlights the trade-offs individuals face when deciding between honesty and deception under different levels of risk and observability.

Preliminary findings suggest participants are more averse to detectable lies due to the higher psychological cost of being caught, supporting the certainty effect hypothesis. This research contributes to behavioral economics by refining models of lying behavior and providing insights into how individuals balance ethical considerations against material incentives. Understanding these dynamics has implications for fields such as business ethics, law, and psychology, where decisions often hinge on the interplay between honesty and self-interest.

Florida State University

Evaluation of Anchoring Effects on Political Survey Assessments

Maria Gonzalez

Nichole Lighthall

Anchoring effects, a cognitive bias where initial information influences subsequent judgments, can impact the reliability of survey estimates. While efforts have been made to mitigate this issue in survey design, the impact of anchoring on politically framed questions remains understudied. The study at hand is concerned with whether anchoring or covariates such as affective polarization explain response patterns across political and apolitical questions. Using a two-level mixed methods design, we varied survey administration (pilot vs. real data) as a between-subjects variable and stimuli type (political, apolitical, vague) as a within-subjects variable. Stimuli consisted of real and fake news headlines rated for perceived ambiguity on a 1 (not at all ambiguous) to 7 (extremely ambiguous) scale. In the pilot survey, a sliding scale defaulted to 4 (somewhat ambiguous), while the real survey used a matrix design without defaults.

We hypothesized differences in average and median headline scores would arise due to anchoring effects. A 2 (survey administration) × 3 (stimuli type) repeated-measures ANOVA revealed a main effect of survey administration but no main effect of stimuli type or interaction. These results suggest anchoring significantly influenced responses, irrespective of headline content. Distribution patterns further supported the anchoring effect. Future research will explore whether this effect is driven purely by anchoring or if affective polarization also plays a role, contributing to the broader understanding of cognitive biases in political cognition.

University of Central Florida

Perceived Political Misalignment and Group Conformity: The Role of Intragroup Threat on Polarized Political Beliefs

Maria Gullesserian

Dr. David March

Social group membership varies in its centrality to an individual's self-identity, defined by the degree to which one is "fused" with the group. Highly fused group identities exert a profound influence on members' attitudes and behaviors, particularly when the group serves as a critical source of safety, resources, and personal meaning. Ostracism or perceived deviation from these valued groups can pose a significant psychological threat. These dynamics are especially relevant to political group identities, which are uniquely tied to deeply held values and serve as strong predictors of individual attitudes and behaviors (Cohen, 2003; Newcomb et al., 1967). The current research examines whether perceiving oneself as less aligned with a political in-group increases efforts to conform to group norms. In a between-subjects design, participants complete scales such as the Identity Fusion Scale (Swann et al., 2009), Belief in a Dangerous World Scale (Altemeyer, 1988), and SECS Scale (Everett, 2013). Participants are then misled to believe their responses align with the opposing political orientation, with half being told the misaligned measure is central to their group's identity and the other half told it is peripheral. Based on prior research indicating that social conservatives adhere more strongly to group norms under threat (Panagopoulos & Van Der Linden, 2016), we predict conservatives will exhibit greater conformity by responding in more polarized ways when faced with a threat to central group values. These findings aim to elucidate the pressures political groups exert on individuals and the situational triggers of polarized behavior in response to perceived threats.

Florida State University

Biocompatibility of new polyurethane-based polymeric materials for sports mouthguard fabrication

Maria Melara

Dr. Dayane Oliveira

Objectives: The aim of this study was to compare the biocompatibility of new polyurethane-based polymeric materials for sports mouthguard fabrication.

Methods: The new polyurethane-based polymeric materials tested were Elastic 50-A and Flexible 80-A (Formlabs). EVA and PolyshokTM (Bufallo) were used as negative control groups. First, L929 fibroblast cells were seeded in 96-well plates using Dulbecco's Modified Eagle Medium (DMEM), supplemented with 10% fetal bovine serum (FBS) as the culture medium for 24h at 37oC in an incubator with 5% CO2 and 95% humidity. Then, 12mm diameter, 4mm thick samples of each polymeric material tested (n=5) were immersed in 24-well plates filled with non-supplemented DEMEM for 24h and stored in the incubator at similar settings. After 24h, the culture medium was replaced with either fresh non-supplemented DEMEM (blank; positive control group) or each extract medium from the different polymeric materials (n=5). After 72h, the cell viability was evaluated using the (3-(4, 5-dimethylthiazolyl-2)-2, 5-diphenyltetrazolium bromide) (MTT) method. This procedure was replicated three times per ISO 10993-5. A power analysis was conducted to determine the sample size to provide a power of at least 0.8 at a significance level of α=0.05. Statistical analyses were performed using ANOVA and Tukey's tests.

Results: All polymeric materials caused reduction of cell viability ($p< 0.0006$; $F=12.63$) in the following order, PolyshokTM < EVA < Elastic 50-A < Flexible 80-A. However, according to ISO 10993-5, all of them were classified as grade 1, reactivity mild.

Conclusions: The new polyurethane-based polymeric materials seem a biocompatible alternative to substitute conventional polymeric sports mouthguards.

University of Florida

Effects of Running on Mental Health (Anxiety and Depression)

Maria Parra Gil

Dr. Wendy Chase

For my research project, I studied how running affects mental health, particularly how it helps reduce symptoms of anxiety and depression. Mental health problems, like anxiety and depression, have become more common, especially among teenagers and young adults. Research has shown that physical activity, like running, helps the body release chemicals such as endorphins and serotonin, which can improve mood and help reduce feelings of stress. Another benefit of running is its impact on the brain's ability to change and grow, known as neuroplasticity, which can help people think more clearly and feel better emotionally. Running also helps lower cortisol, a hormone that is connected to stress, which may help lower anxiety levels. This project

looks at the different ways running can benefit both the body and mind.

I approached this research from a biological and psychological perspective. This means I l looked at how running physically affects the brain and body, as well as how it affects a person's thoughts and emotions. I reviewed scientific studies and expert opinions about the biochemical processes that happen during running, such as the release of endorphins and serotonin. I also explored how running affects mental health in terms of reducing stress and boosting mood. My main method was to analyze existing research and to consider my personal experience as someone who runs regularly, to understand the impact of this activity on one's mental and physical health.

Florida SouthWestern State College

Membrane Palmitoylated Protein 2 (MPP2) as a Target for Improving Memory in Young Adult and Aged Mice

Mariam Uddin

Robert W. Stackman, Jr.

Episodic memory, the memory for recalling personal events, relies upon a network of associated medial temporal lobe brain structures, including the hippocampus. The memory impairment associated with Alzheimer's Disease (AD), is a result of the disturbances in hippocampal activity. Progressive cognitive decline is a hallmark of AD, yet current treatment approaches are quite limited in successfully improving cognitive function. Discovering novel targets is essential in developing effective treatments for those suffering from learning and memory impairments. Therefore, understanding the neurophysiological and neuropathological changes that bring about age-related and AD-associated cognitive decline is of great importance. Previous work has shown that the pharmacological blockade or genetic deletion of synaptic type 2 small conductance Ca^{2+}-activated K^+ (SK2) channels enhances hippocampal long-term potentiation (LTP) and memory, while pharmacological activation or genetic overexpression of SK2 impairs LTP and memory. SK channels restrict the processes involved in long-term memory by influencing glutamatergic excitatory postsynaptic potentials and NMDA receptor-dependent synaptic plasticity in hippocampal and neocortical circuits, which are essential for memory formation. SK channel activity also limits NMDA receptor mediated excitotoxicity. Membrane palmitoylated protein (MPP2) is a synaptic MAGUK scaffold protein that secures SK2 channels within the postsynaptic density of neurons in the hippocampus and cortex. Our data suggests that knockdown of MPP2, via CRISPR/Cas9 gene editing, enhances glutamatergic excitatory postsynaptic potentials in the mouse hippocampus, leading to enhanced non-spatial memory in young adult and aged male and female mice.

Florida Atlantic University

Complications and Resource Utilization Following Liver Transplantation from Donors after Circulatory Death

Mariana Silveira Vilani & Thrisha Acharya

Dr. Vijay Subramanian

The growing disparity between the number of patients on the liver transplant (LT) waitlist and the availability of donor organs has led to the increased utilization of livers from more medically complex donors. Deceased organ donors are classified as brain-dead donors (DBD), whose organs are procured after a confirmed diagnosis of brain death, and donors following circulatory death (DCD), whose organs are retrieved after irreversible cessation of circulatory function. Physiological differences and ischemia times between these donor types may impact graft outcomes and resource utilization. This retrospective single-center study, conducted from January 2020 to April 2024, compared outcomes among 755 LT recipients, 649 from DBD and 106 from DCD excluding patients under the age of 18. DCD donors had a higher donor risk index (0.98 vs. 0.55, $p < 0.001$) and shorter cold ischemia times (5.7 vs. 6.18 hours, $p = 0.005$), while recipients of DCD grafts exhibited lower Model for End-Stage Liver Disease (MELD) scores (18 vs. 25, $p < 0.001$). Post-LT, DCD recipients experienced higher rates of early allograft dysfunction (EAD), acute kidney injury (AKI) (24% vs. 28%, $p < 0.001$), and biliary complications (11% vs. 4%, $p = 0.015$), necessitating greater post-operative resource utilization. Despite these increased complications, no significant difference in overall post-LT survival was observed between DBD and DCD recipients. These findings suggest that, when used in appropriate recipients, DCD grafts can help address organ shortages without compromising long-term survival.

University of South Florida

The Legal Challenges of Ibogaine-Based Psychedelic Treatments for U.S. Military Veterans

Marianne Ruschman

Mason Marks, MD, JD

This project analyzes the legal challenges of providing ibogaine treatment to U.S. military veterans. A psychoactive drug produced by Tabernanthe iboga in central Africa, ibogaine has gained national attention because early research suggests it could treat post-traumatic stress disorder (PTSD), traumatic brain injury (TBI), and substance use disorders (SUDs). The Department of Veterans Affairs reports that 23% of veterans receiving VA healthcare have experienced PTSD, 29.3% have experienced TBI, and 11% have diagnosed SUDs. Although ibogaine could potentially treat these conditions, its safety and effectiveness are poorly characterized, and it poses serious physical and psychological risks, including potentially fatal heart dysfunction in susceptible individuals.

To evaluate the legal challenges of treating veterans with ibogaine, the project analyzes existing regulations. The federal Controlled Substances Act classified ibogaine as a Schedule I drug, reflecting a high potential for abuse and a lack of accepted medical use. The Food and Drug Administration allows research on Schedule I drugs. However, ibogaine's scheduling and health risks create heavy restrictions on potential testing.

Consequently, most research occurs abroad, and veterans must leave the U.S. to receive treatment where ibogaine is legal or unregulated, creating additional risks. Due to the general lack of effective and accessible treatments for PTSD, TBI, and SUD, Congress has acknowledged ibogaine as a potential partial solution. Congress authorized the Secretary of Defense to conduct ibogaine studies with U.S. service members. In addition to analyzing these developments, the project explores further reforms to promote safe and ethical ibogaine research and potential treatment.

Florida State University

Environmental assessment of nitrate pollution in Wagner Creek and Little River Canal, Miami, FL

Marielca Mondesir

Dr. Selwyn A. Williams

Nutrient pollution, primarily nitrogen and phosphorus, is one of the most widespread, costly and challenging environmental problems in the U.S., according to the Environmental Protection Agency (EPA). The primary sources of nutrient pollution are fertilizer, animal manure, sewage treatment plant discharge, detergents, stormwater runoff, cars and power plants, failing septic tanks and pet waste. In this study, nutrient pollution in two urban waterways were monitored as a preliminary assessment of water quality. Wagner Creek/Seybold Canal and Little River Canal are natural and modified waterways which serve as part of the surface drainage and storm water runoff system in central and north Miami, respectively. Specifically, levels of nitrogen in these bodies of water were monitored by photometric detection of nitrate. Three sites (two at Wagner Creek, and one at Little River Canal) were used for periodic sample collection spanning from Spring 2023 to Summer 2024. Samples were assessed for their nitrate content and biotoxicity. Nitrate levels at both Wagner Creek and Little River Canal were determined to be comparatively low (0.0 mg/L - 1.10 mg/L) and were consistent in value range with concentrations previously reported by the EPA. Biotoxicity was also qualitatively assessed to be negligible compared to negative controls. Preliminary data suggest nitrogen content continues to be well mitigated in both waterways and currently is not a major contributor to nutrient pollution of Miami Dade's surface drainage systems.

Miami Dade College

The Cost of Being Female: A Survey on the Pink Tax

Marjon Borjian

Monica Escaleras

The "pink tax" refers to the price disparity between products and services marketed to females, often for items that are nearly identical to those marketed to males. My research explores public perceptions of this economic phenomenon, specifically testing if male and female responses differ. I hypothesized that females would view the pink tax as unfair, while males would find it fair. I also hypothesized that more females would support laws against the pink tax. To test my hypothesis, I created a 16-question survey and distributed it through Amazon MTURK, where I was able to collect 180 responses which were then analyzed using IBM's SPSS. Contrary to my hypothesis, I found that a significant portion of females (47.8%) viewed the pink tax as somewhat fair, with only 9.8% finding it somewhat unfair. Furthermore, 86% of males supported legislative action to make the pink tax illegal, compared to 73.93% of females. A notable 26.1% of females disagreed, compared to just

8.1% of males. These results suggest that many females do not see the pink tax as unjust but still support policy changes to address it. Interestingly, a higher percentage of males favor legislative action, revealing a discrepancy between public perception and actual support for legislative reform. The findings are significant at the 2% and <0.001% levels, respectively, challenging commonly held assumptions about gender-based views on the "pink tax," therefore advancing research about gender-focused economic studies.

Florida Atlantic University

Endo-fights: A Study of Antifungal Secondary Metabolites from Endophytic Fungus

Mars English

Bill Baker Ph.D.

In recent years, the use and abuse of antimicrobial drugs has led to the rise of a new enemy for humankind: Antimicrobial Resistant Pathogens. These pathogens are becoming increasingly resistant to drugs designed to treat or kill them, posing significant challenges in managing such infections. Notable examples include Candida albicans and Candida auris, two species of multidrug resistant yeast that disproportionately affect immunocompromised individuals. Given the rising threat of antimicrobial-resistant pathogens like Candida spp., exploring alternative sources of antimicrobial drugs has become increasingly important. One possible source of novel antimicrobials are fungal endophytes. These have millions of years of experience combating microbes that pose a threat to their hosts. We can use their experience for our own purposes. This research seeks to explore the bioactive compounds found in a library of 10,000 endophyte isolates and test their efficacy as an antifungal for pathogenic Candida spp. These secondary metabolites are isolated through bioassay guided isolation, while dereplicating known compounds through the use of molecular networks and A.I. driven tools.

University of South Florida

The Influence of GENDER and CULTURAL BACKGROUND on COPING MECHANISMS within SPACE ANALOG ENVIRONMENTS

Mary Marcella & Claudia Allocca

Dr. Shawn Burke

The dynamics of team performance in space exploration is critically shaped by how crew members manage stress, regulate emotions, and cope with the psychological demands of confined, high-stress environments (Wagstaff & Weston, 2014). Gender roles and cultural expectations influence how individuals approach challenges, handle interpersonal conflicts, and regulate emotions, which create diverse patterns of adaptive and maladaptive behaviors within a team (Crotty & Betty, 2012). Consequently, understanding how gender and cultural differences influence coping mechanisms is vital when striving for psychological well-being, and interpersonal harmony under extreme conditions (Shirazi et al., 2011). In this study, we aim to highlight the impact of these differences on crew members' preparation for future long-duration space missions. We investigate coping strategies employed by 46 crew members participating in different space analog missions from six different analog stations, focusing on the ways in which gender and cultural background intersect to influence stress response and interpersonal dynamics. Analyzing daily journal entries written by analog crew members throughout their missions provide insight into how individuals cope with isolation, stress, and interpersonal tensions in confined environments. Examining these journals, we explore coping strategies and how gendered and cultural expectations influence these responses. This analysis strives to identify affect regulation patterns, explore gender and cultural background, and provide insight on crew performance, promote mental health, and minimize conflict in space exploration's high-stress environment.

University of Central Florida

SCUBA science: Method Comparison of ROVING DIVES and STRIP TRANSECTS in Sub-tidal Sea Star Population Surveys

Mary Schneider

Dr. Brian Bingham

Environmental censuses are of critical importance to developing our understanding of diversity and ecosystem health and change over time. The methods for conducting censuses should be tailored to the relevant terrain while maintaining standards of scientific rigor, which requires preliminary understanding of intrinsic biases and respective methodological strengths and weaknesses. In the field of scientific diving, high costs and low available person-hours make research logistically complex. Line transects (LT) and roving diver (RD) are both common methods which are important to profile relative to each other. Line transects are well regarded as rigorous and organized, but they can be time consuming—especially for non-professionals

such as citizen scientists. Roving diver is more accessible and time-efficient but produces only time-based rather than the area-based organism density measurements which are often preferred in applied ecology studies. This unit incompatibility between transects and roving dives impedes cross-method data analysis and limits the potential collaboration of inter-organizational databases. Prior studies have compared LT and RD in the context of fish populations but have not examined surveys of benthic invertebrates. To fill this gap, we simultaneously employed both techniques to survey sea-star populations at 10 rocky sub-tidal sites in the Salish Sea. We found that roving diver and line transect methods produced functionally interchangeable reports of abundance and species evenness. However, our data demonstrates that RD may more effectively quantify presence/absence data and species diversity. These findings facilitate the application of data derived from roving divers, which expands the purview of this accessible method.

University of Florida

Accelerating Real-Time Inference with FPGA-Implemented Logic Gate Neural Networks

Matheus Kunzler Maldaner & Raul Valle

Dr. Damon L. Woodard

In applications demanding near-instant data processing, such as security systems and defense mechanisms, rapid and efficient neural network inference is critical. This work introduces a novel method for accelerating inference by extracting learned logic gates from differentiable logic networks and implementing them on Field-Programmable Gate Arrays (FPGAs). Unlike traditional neural networks that rely on weighted connections, these networks learn real-valued logic functions, allowing for a direct and efficient mapping onto hardware circuitry. By deploying the learned logic architectures onto FPGAs, we significantly reduce inference latency and potential for power consumption, making the approach suitable for real-time analysis tasks. Furthermore, we employ novel node pruning techniques to simplify the network architecture, enhancing inference speed without substantial accuracy loss. Our results demonstrate that this method outperforms conventional GPU-based inference, especially as model complexity increases, highlighting the scalability and efficiency of logic gate-based neural networks on FPGA hardware.

University of Florida

Parents Use Restrictive Mediation to Prevent Cyberbullying Across Grade Levels

Matthew McGovern

Tracy Bales

Cyberbullying among youth in the United States constitutes a rising public health concern. While parents commonly restrict their children's online use to protect them from potential threats, the motivations behind parents' use of these restrictive mediation behaviors remains understudied. Guided by the theory of planned behavior (TPB), which focuses on how individual intentions become action, this study explores how parents' attitudes, social norms, and perceived behavior control influence their engagement in restrictive mediation. The purpose of this study is to: 1) investigate how parents' restrictive mediation differs across grade levels; 2) examine whether higher levels of parental attitudes, social norms, and perceived behavioral control regarding cyberbullying predicts parents' restrictive mediation; 3) examine the underlying constructs of the Parent Cyberbullying Awareness Survey consistent with the TPB. This study examines secondary data of parents/caregiver responses (n=278) to the Parent Cyberbullying Awareness Survey, collected by the Anti-Bullying Advisory Committee to the Hillsborough County Board of County Commissioners between July 2022 and August 2023. A one-way analysis of variance will be conducted to determine any mean differences in restrictive mediation behaviors across grade levels. A multiple regression analysis will be conducted to identify the unique contributions and predictors of restrictive mediation behaviors. A confirmatory factor analysis will examine underlying constructs of the survey by identifying latent factors consistent with the TPB domains. The findings from this study offers a novel, theory-based method for measuring parental awareness and increases our scientific knowledge of parents' restrictive mediation strategies across grade levels.

University of Central Florida

Bacteria-Mediated Regulation of Host Stress Responses

Matthew Tibi

Daniel Czyz

Proper regulation of the heat shock response (HSR) and oxidative stress response (OSR) is crucial for maintaining organismal protein homeostasis ("proteostasis"). Disruption of the proteostasis network can lead to protein misfolding and aggregation, which hallmarks neurodegenerative protein conformational diseases (PCDs).

Neurodegenerative PCDs are a leading cause of geriatric death and disability worldwide and currently lack cures and a defined etiology. Recent evidence suggests a potential link between gut microbiota alterations and PCDs, but the specific bacterial strains involved, and the underlying mechanisms remain unclear. To elucidate the role of bacteria in PCD pathogenesis, we previously screened 229 human bacterial isolates for their impact on toxic protein aggregation in Caenorhabditis elegans expressing polyglutamine (polyQ), tau, Aß1-42, and α-synuclein. Our results showed bacteria consistently either suppress or enhance protein aggregation, indicating their effect on the host proteostasis network rather than targeting specific proteins. Here, we further explore how proteotoxic and proteoprotective bacteria influence host proteostasis, focusing on the HSR and OSR. Using transcriptional fusion reporters for HSR (hsp70p::GFP) and OSR (gcs-1p::GFP, a downstream target of SKN-1/Nrf2), we reveal a pattern in which certain proteoprotective bacteria activate the host HSR, while certain proteotoxic bacteria trigger the host OSR. These results reveal distinct mechanisms through which bacteria influence host proteostasis and protein aggregation. Together, our findings highlight the potential of manipulating microbial communities to enhance host proteostasis, presenting a promising strategy for addressing diseases characterized by dysregulated proteostasis and protein aggregation.

University of Florida

Study Design for Stroke Prevention in Young Adults within Underserved Communities

Mauricio Gallardo-Fuentes & Jadyn Arter

Dr. Josephine Huang

Stroke is the fifth leading cause of death and the leading cause of disability in the United States, with an increasing incidence among young adults (18–45 years), particularly within Black and other minority populations. Young adults now account for 10–15% of all strokes, highlighting a critical public health challenge. This study investigates the impact of a community-based education initiative in Jacksonville, Florida, targeting stroke risk factor awareness and symptom recognition among ethnic minority young adults. The primary objective is to assess improvements in stroke risk awareness, prevention knowledge, and preparedness to act on recognizing stroke symptoms. A secondary objective is to screen for hypertension prevalence within the target population. Over six months, outreach will take place at college campuses and community events, such as churches, to identify participants aged 18–45. Participants will complete an initial questionnaire on demographics, primary care provider (PCP) status, and existing hypertension diagnoses. They will receive education on stroke risk factors—such as hypertension, smoking, and substance use—and the importance of 9-1-1 in emergencies. Blood pressure screenings will identify participants at risk, with resources provided to establish care with a PCP. Barriers such as limited healthcare access, cultural beliefs, and health literacy disparities will also be examined to inform tailored interventions. The study aims to provide actionable strategies to reduce stroke risk, enhance symptom recognition, and address healthcare disparities within ethnic and minority communities, ultimately contributing to improved outcomes and reduced disability in this vulnerable population.

University of North Florida

The Impact of Space Debris on Launches

Max A. Blumenfeld

Dr. Crystal Taylor

Space debris proliferation presents a collective action problem between the nations and companies which engage in space activity. Space debris left in orbit not only remains but proliferates to an extent that scientists hypothesize that debris may become dense enough to limit extra-atmospheric activity in what is known as the Kessler Effect (Kessler and Cour-Palais, 1978). This research investigates “To what extent, if any, does space debris affect launches?” Public and private launches and data on trackable (10+ cm) debris ranging from 1957 to 2024 was collected from the European Space Agency’s Space Debris Office. This research runs a time-series regression which controls for payloads and average costs per launch in order to isolate the effect of debris on launch frequency. Preliminary results show that there is a diminishing effect of space debris on launches. This indicates a potentially negative effect on GDP, resulting from our reliance on satellites for navigation, communication, finance and more. Innovations from the private sector in the form of ‘deorbiting firms’ such as Switzerland-based ClearSpace, are leading the way to solve this mounting debris issue. Governments should set up an incentive structure to enable private firms to help solve these problems. If deorbiting efforts are profitable to firms, we may circumnavigate the international collective action dilemma present in aerospace.

Florida State University

Optimizing CRISPRi Gene Silencing of Putative Drug Targets in Mycobacterium abscessus

Max Ivanov

Dr. Kyle Rohde

Mycobacterium abscessus (Mab) is a non-tuberculous mycobacterium (NTM) that is responsible for increasing numbers of pulmonary infections globally, particularly in cystic fibrosis and chronic pulmonary disease patients. Mab infections can cause severe lung damage and are associated with a higher mortality rate when compared to other NTMs. Current treatment plans involve lengthy regimens of multiple antibiotics and are often met with failure, highlighting a need for new drug targets. The CRISPR Interference (CRISPRi) system provides a potential solution, where genes can be selectively silenced at the transcriptional level, allowing for putative drug targets to be discovered. This is done using an inactivated Cas9 protein (dCas9), which is guided to Protospacer Adjacent Motifs (PAMs) in the bacterial genome by single guide RNAs (sgRNAs), to block downstream transcription. This system has shown promise in Mycobacterium tuberculosis (Mtb), but it is less effective in Mab. This project seeks to optimize CRISPRi in Mab by testing variations in sgRNA length, PAM type, and dosage of dCas9. Currently, the success of CRISPRi silencing after induction is measured by both phenotypic spot plating and qRT-PCR. To make future evaluation efforts easier, I am developing a luciferase reporter system that will make Mab luminesce, which on its own will function as a live/dead reporter. Additionally, by coupling the luciferase operon with the CRISPRi-targeted gene of interest, successful silencing of the gene should also have the polar effect of loss of luminescence. This will allow for sensitive, real-time quantification of CRISPRi-mediated transcriptional silencing and evaluation of gene vulnerability.

University of Central Florida

Efficacy and Safety of PCSK9 Inhibitors in Pediatric Heterozygous Familial Hypercholesterolemia

Mebaliah Luchini de Almeida Torres

Dr. Hector Gomez

Heterozygous familial hypercholesterolemia (HeFH) is a genetic disorder characterized by elevated low-density lipoprotein cholesterol (LDL-C) levels from early childhood, significantly increasing the risk of premature cardiovascular disease (CVD). While statins and ezetimibe are first-line treatments, many pediatric HeFH patients fail to achieve LDL-C targets, necessitating alternative therapies. PCSK9 inhibitors, such as Alirocumab and Evolocumab, have shown efficacy in significantly lowering LDL-C levels in adults, but their potential in pediatric HeFH populations requires further exploration. Current gaps include variability in treatment response due to genetic differences affecting LDL receptor function and limited long-term safety data. The search terms “PCSK9 inhibitors” and “heterozygous familial hypercholesterolemia” were employed, yielding 280 articles. These were screened for relevance to pediatric HeFH and LDL-C reduction, focusing on studies with empirical data on efficacy and safety. This process narrowed the selection to a set of relevant studies, which were further analyzed. Alirocumab and Evolocumab have been shown to lower LDL-C levels in pediatric HeFH patients, with studies reporting significant improvements similar to those in adults. Alirocumab has been linked to notable LDL-C reductions, and Evolocumab has consistently demonstrated decreases compared to placebo. Both drugs were generally well tolerated, with no major safety concerns. However, individual responses varied, especially in patients with genetic mutations affecting LDL receptor function, suggesting treatment may need personalization. Long-term efficacy and impacts on atherosclerotic progression remain unconfirmed. These findings highlight the potential of Alirocumab and Evolocumab as effective treatments for pediatric HeFH. Future studies should address long-term safety, genetic influences, and broader accessibility.

University of South Florida

Differences in Health-Related Quality of Life Among Breast Cancer Survivors by Hispanic Origin in a Cross-Sectional Study

Meera Lakshmanan

Eunkyung Lee

Research has examined health-related quality of life (HRQOL) among breast cancer survivors, finding that Hispanic women report lower HRQOL compared to non-Hispanic White women. However, Hispanics are not a homogeneous population, and varying socioeconomic statuses and lifestyle factors may cause differences in HRQOL. This study examined differences in HRQOL by Hispanic origin among breast cancer survivors in Central Florida using data collected for the ‘Hispanic breast cancer study’ at the University of Central Florida. Patient contact information was obtained from the Florida Cancer Data System. Eligible patients were sent an invitation letter and response form to indicate interest. Following state-mandated recruitment

procedures, a second mailing was sent if no response was received. Surveys were then sent to interested participants according to their preferred method (mail or online) and language (English or Spanish). The Functional Assessment of Cancer Therapy – Breast (FACT-B) was utilized to assess five domains of HRQOL: physical, social, emotional, and functional well-being, with a breast-cancer subscale. Higher domain scores indicated better HRQOL. 165 eligible participants completed the surveys (18 Colombians, 10 Cubans, 11 Dominicans, 10 Mexicans, 95 Puerto Ricans, and 21 from other Hispanic backgrounds). The mean FACT-B total score was 102.6 across all groups. Cubans reported the highest mean score (116.3), while Dominicans reported the lowest mean score (97.8). Income, education level, marital status, smoking status, alcohol consumption, laterality, cancer stage, treatment type, and surgery type were associated with specific HRQOL domain scores, which may help explain the disparities in HRQOL among Hispanic breast cancer survivors.

University of Central Florida

Mangrove Menagerie: The Future Pharma-Sea

Megan Dillman

Dr. Baker

In recent years, the abuse of antifungal drugs has led to the rise of a new threat to human health, antimicrobial resistant Candida auris and Candida albicans. These are multidrug resistant fungal pathogens that cause nosocomial infections leading to candiasis and in severe cases candidemia and even death. Their impact has intensified the demand for novel drugs that can treat these diseases. The study of marine endophytes, fungal species which live in a symbiotic relationship with their host plant and produce secondary metabolites that protect the plant from external threats, could aid in the search for novel antimicrobials. One of these endophytes is a strain Rhizoctonia, isolated from a leaf of a red mangrove tree in the Everglades. The crude extract of this endophyte exhibits strong bioactivity against C. albicans and C. auris as well as low cytotoxicity. This crude extract was then fractionated in a bioassay guided manner. Secondary metabolites were then identified with the use of NMR techniques, while also dereplicating known compounds with the help of Molecular Networking tools like GNPS as well as AI and neural network tools such as DeepSAT and SMARTNMR.

University of South Florida

Impacts of Digital Technology on the Preservation and Transmission of Heritage and History

Megan Meese

Dr. Eleni Bozia

People's identities are deeply connected to the objects and places that are part of their history and heritage. Many sources of tangible cultural heritage are inaccessible to the public at best and threatened by imminent eradication at worst. In between lie many dangers, including environmental degradation, anthropogenic destruction, and continued displacement. As with other problems, it is important to consider how technological advancements can be employed to address and mitigate the detrimental implications. By creating digital 3D models of artifacts firsthand and consulting existing academic literature in numerous fields, it became evident that digitization can safeguard and disseminate knowledge of such key sites and artifacts, thereby maintaining and immortalizing integral aspects of various cultures. Primary examples include 2D scans of documents, digital and physical 3D models of artifacts, online tours of heritage sites, and virtual reality simulations that portray ruins prior to their state of disrepair. The widespread accessibility granted by such digital preservation methods promotes these virtual versions as instruments of learning in museums, classrooms, and other settings. It also helps bridge the disconnection between people and the objects of utmost importance to their heritage. As part of the Digital Epigraphy and Archaeology Project (DEA), a global initiative established by the University of Florida's Digital Worlds Institute and the Department of Classics, this project provides key insights into how various digitization technologies can be utilized to advance education, access, and preservation of histories and heritages from around the world.

University of Florida

Nourishing Smiles: The Vital Link Between NUTRITION and ORAL HEALTH

Mena Armosh

Amy Bohan

The relationship between oral health and nutrition is a critical area of study, bridging the fields of dentistry and nutritional sciences. Poor nutrition significantly contributes to oral health problems such as dental caries and periodontal disease, which are linked to severe systemic health issues, including heart disease, diabetes, and systemic

infections. These conditions compromise individual well-being and reduce quality of life.

This research explores how specific nutrients and dietary patterns influence oral health outcomes, aiming to identify strategies for disease prevention and management. Key nutrients such as calcium, vitamin D, antioxidants, and omega-3 fatty acids are vital for maintaining oral and systemic health, while diets high in sugar and processed foods increase susceptibility to oral diseases. By investigating how these factors affect oral microbiota, this study provides a comprehensive understanding of how nutrition impacts oral health.

Overall, we found significant implications for public health, emphasizing the need for integrative approaches to oral disease prevention. By understanding how specific nutrients and dietary patterns affect oral health, individuals can make better dietary choices, improving health outcomes and quality of life. Further research in this area is necessary to explore emerging dietary trends and their impact on oral health, providing a thorough understanding of this important relationship. By addressing these various aspects, this study highlights the importance of an integrated approach to health that encompasses both nutrition and oral health. Future research and public health initiatives should continue to explore these connections to develop comprehensive strategies for promoting better health outcomes.

University of South Florida

Hypertension Management in Menopausal Women through Physical Activity

Meriam Naguib

Dr. Humberto Lopez Castillo

Hypertension is a chronic condition that is known for its persistent elevated blood pressure of blood in the blood vessels. Hypertension affects about 1.3 billion people worldwide. It affects all ages, even children as young as six years of age. However, the highest prevalence of hypertension is observed in adults from 30-79 years old. Hypertension is often referred to as the "silent killer" because many patients who have hypertension are asymptomatic and this condition goes frequently unnoticed; however, in severe cases, patients may experience headaches, dizziness, blurred vision, chest pain, difficulty breathing, and many more symptoms. Women in particular are impacted by hypertension as they age. The high mortality rate of hypertensive heart failure is 69% among women is of particular concern. Hypertension showed a significant increase since 1990, particularly among women who are 30 years and older. Compared to men, women are more susceptible to hypertension due to their loss of estrogen hormone protective effect and social determinants, negatively affecting their cardiovascular system, which increases their susceptibility to hypertension after menopause. Physical activity is the primary non-medical intervention that can help with reduction of hypertension, especially for women. The main benefit of physical activity is that it helps with the reduction of blood pressure. It allows for vasodilation of the blood vessels, by releasing NO to dilate the walls of the vessels, which then allows for better blood flow. Physical activities allow individuals to have a stronger and efficient heart, improvement of blood circulation with more elastic blood vessels.

University of Central Florida

The Outcomes of Implementing CARS-2 for Faster ASD Diagnosis and Access to ABA Therapy on Different Insurances

Meybelyn C. Bauza

Dr. Takahiro Soda

Parents of children with concerns for autism spectrum disorder (ASD) have reported delays to diagnosis and referrals for services as long as three years from first concern of ASD (Zuckerman et al., 2015). One of the labeled barriers to access to early intervention is healthcare guidelines that require a comprehensive autism diagnostic evaluation (CADE) prior to referral for some autism services (Zablotsky et al., 2014). There are many barriers to completion of this evaluation that further exacerbate delays, such as long wait lists and the resource-intensive nature of the assessment tools. To address this barrier, the UF Developmental and Psychiatry Clinic implemented a policy change wherein a CARS-2 was conducted during an initial psychiatry appointment. In the present study, 172 records were reviewed in which delays to diagnosis and referrals for ABA therapy were compared before and after the policy change. A two-sample t-test showed that the days from initial evaluation to diagnosis were statistically significant when compared across private and Medicaid insurances. A two-proportion significance test showed that implementing a CARS-2 evaluation (p_1=.5, n_1=20) leads to an increased number for ABA therapy referrals than before the policy change (p_2=.26, n_2=23) for private insurance, $z = 1.65$, p =.05, which shows a decreased wait for referrals for services. Medicaid had an increase in proportions; however, not significantly greater between before/after the policy implementation. Future directions will

include comparing these findings to other clinics without implementation of CARS-2 scoring that were also included in the data collection of this study.

University of Florida

Macrophages and Cancer: Exploring DNMT3A Mutation in Bone Marrow-Derived Macrophages

Mia Morin

Olga Guryanova

Clonal hematopoiesis describes the clonal expansion of a hematopoietic stem cell and its mature progeny that harbor a mutation, usually in a leukemia-associated gene. Loss-of-function mutations in DNMT3A, a gene which encodes a de novo DNA methyltransferase, is the most commonly observed genetic alteration in clonal hematopoiesis and can be modeled in mice by a Dnmt3a knock-out. In previous studies, heterozygous DNMT3A loss specifically in the blood system resulted in increased tumor burden and a more advanced disease in a model of colitis-associated colon cancer. Yet, the mechanisms through which clonal hematopoiesis promotes the severity of coincident non-hematologic cancers remain incompletely understood and need investigation, although dysfunctional phagocytes have been implicated. Here, we used bone marrow-derived macrophages from mice with a heterozygous Dnmt3a knock-out to investigate their phagocytic function and ability to support cancer cell proliferation. We found a significantly weakened phagocytic capacity in the Dnmt3a+/Δ macrophages and a trend towards increased cancer cell proliferation. These findings suggest that DNMT3A plays an important role in regulating the anti-tumor immune response, and DNMT3A mutation in the blood system may create a permissive tumor microenvironment for cancer cells to persist.

University of Florida

Ultra-high Molecular Weight Polymer Synthesis via Aqueous Dispersion Polymerization

Micayla Vereb

Dr. Brent Sumerlin

We report the synthesis of ultrahigh-molecular-weight (UHMW) double-hydrophilic block copolymers (DHBCs) via polymerization-induced self-assembly (PISA) to obtain a concentrated, but free-flowing, dispersion of UHMW water-soluble particles. By leveraging the salt sensitivity of poly(N-acryloylmorpholine) (PNAM), we polymerized NAM from a salt-tolerant poly(N,N-dimethylacrylamide) (PDMA) macroiniferter in 0.5 M (NH4)2SO4 to yield free-flowing solutions of polymeric particles comprised of UHMW PDMA-b-PNAM. The kosmotropic (NH4)2SO4 caused the salt-sensitive PNAM chains to become increasingly hydrophobic with increasing polymer molecular weight, eventually inducing self-assembly during chain extension. To retrieve the UHMW polymers from solution, simple dilution with water lowered the (NH4)2SO4 concentration sufficiently to resolubilize the PNAM chains, affording a highly viscous solution of fully dissolved DHBCs. The low viscosities (<6 Pa·s) and shear-thinning behaviors of these particle solutions permitted their synthesis in a continuous flow setup. The simplicity of this synthetic route has enormous implications for the facile production of UHMW materials on an industrial scale.

University of Florida

AI-Driven Post-Silicon Root Cause Analysis for Hardware Defects

Michael Castiglia

Dr. Mike Borowczak

When designing electronic hardware, design defects occasionally exist beyond standard verification procedures occuring prior to the design being fabricated and are instead found during testing afterwards. While it's already difficult to find the root cause of these defects during any stage of the design process, the comparative lack of data available post-fabrication makes the process much more difficult. Currently, engineers must use the collective knowledge and experience of experts within the group to make the best guess about which component contains the root cause defect, which is then tested. This cycle is repeated for as long as necessary. Artificial Intelligence (AI) techniques are being explored to reduce the time needed within this cycle by having better inferences on the root cause component which can then be investigated further using traditional verification techniques. Additionally, the time needed for these traditional verification methods can be reduced by increasing the precision of the root cause inferences, which AI may also be able to assist with.

University of Central Florida

Graft Copolymerization of Methyl Methacrylate on Corn Pulp

Michael Floreal

Isaiah Urhoghide

Graft copolymerization is a cost effective and widely used method to create heavy metal adsorbents. This study aims to investigate the production of adsorption material utilizing corn cob and Methyl Methacrylate. Several batches of chopped, dried, and grounded corn cobs were pulped using the chlorite pulping method. Methyl methacrylate (MMA), corn pulp and Ammonium Cerium IV Nitrate (CAN) initiator were mixed in an aqueous solution at 40˚ to commence graft copolymerization of the corn cob. After using a hydroquinone solution to halt the reaction, the product was allowed to soak in an ethanol solution, filtered, and then extracted using an acetone solution to remove the homopolymer. The use of Infrared Spectroscopy (IR) was employed to demonstrate the occurrence of grafting. A carbonyl peak at 1750 cm-1 on our samples indicates a successful graft. The percent graft, which is the weight grafted over the weight of corn cob, and initiator concentration were shown to be directly proportional before. As initiator concentration increased, the percent graft efficiency—that is, the percentage of graft over the weight of the homopolymer, rose and subsequently fell.

Miami Dade College

Feeding the Mind: The Emotional and Attitudinal Pathways Linking Binge Eating to Body Image

Michael Valuta

Lindsey Rodriguez

This study investigates whether college students who binge eat have a worse perception of their bodies. Additionally, the study examines various eating attitudes and difficulties with emotional regulation that may mediate this relationship. Eating attitudes include dieting, bulimia, food preoccupation, and oral fixation. Difficulties with emotional regulation include non-acceptance of emotional responses, difficulties engaging in goal-directed behaviors, impulse control, lack of emotional awareness, lack of regulation strategies, and lack of emotional clarity. Data was collected from a sample of college students (N = 542) through a Qualtrics Survey. We hypothesized that college students who are strongly engaged in binge eating behaviors will have significantly worse perception of their body shape. We expected that eating attitudes regarding dieting and food preoccupation, as well as non-acceptance of emotional responses would mediate this relationship the most. Our results show that binge eating is significantly ($p = 0.000$) associated with worse body shape perception, and that all of the A-paths for the mediation model were significant. The significant B-paths of the mediation are eating attitudes related to dieting ($p = 0.000$) and food preoccupation ($p = 0.010$), as well as non-acceptance of emotional responses (0.002). This study has implications for understanding the stigma that people with binge eating behaviors have about their body. Furthermore, the study explains how these peoples' attitudes toward eating connect their binge eating behavior with their body perceptions.

University of Florida

Intermarriage and Resilience: Exploring the Role of Cross-Cultural Bonds During the Holocaust

Michelle Garrett Di Scala

Danielle Wirsansky

This research builds on Bound by Love, a documentary by Danielle Wirsansky and Donald Gojak, which examines the role of intermarriage during the Holocaust. The documentary's portrayal of mixed-marriage families as a challenge to Nazi racial ideology directly informs the research questions: How did intermarriage influence survival and resilience among Jewish communities, and how did Nazi policies impact intermarried couples and their families? Expanding on the documentary's insights, this study explores the protective power of cross-cultural bonds amidst systemic persecution. Methodologically, the research employs documentary filmmaking techniques, including interviews with descendants of intermarried couples and the editing of archival footage, to weave personal narratives into the historical record. These methods illuminate intermarriage's historical and contemporary significance as a lens for understanding resilience. By blending historical analysis with documentary storytelling, this project seeks to highlight the multifaceted role of intermarriage during the Holocaust. It highlights intermarriage not only as a personal decision but also as a source of resilience and defiance, contributing a nuanced perspective to the Holocaust and the broader understanding of cross-cultural relationships in times of crisis.

Florida State University

Rescue and Prolonged Protection from Fentanyl Overdose with Novel Bioorthogonal Covalent Mu Opioid Receptor Antagonists.
Michelle Kirkpatrick

Jay P. McLaughlin

To generate a longer-lasting treatment against mu-opioid receptor (MOR) agonist overdose, we synthesized and characterized a series of covalent MOR antagonists capable of selective irreversible binding to MOR via a recently developed bio-orthogonal proximity-guided Sulfur (VI) Fluoride Exchange (SuFEx) reaction.Computational design guided the synthesis of naloxone derivatives with a weak electrophilic SufEx "warhead", SOF. Naloxone oriented the SOF moiety in close proximity to nucleophilic tyrosine-150, covalently attaching it to the receptor.

Tested in mice with the 550C warm-water tail-withdrawal assay in vivo, the stereoisomer TJ-171 showed no antinociception on its own, but dose-dependently antagonized morphine or fentanyl antinociception after a subcutaneous (s.c) pretreatment (with 0.3-30 mg/kg). Pretreatment with TJ-171 (30 mg/kg, s.c.) significantly antagonized morphine and fentanyl for 24 h, With full recovery only seen after 48 h, consistent with the reported turnover time of the MOR in mice.

Prophylactic administration of TJ-171(30 mg/kg, s.c.) further protected against fentanyl-induced respiratory depression and hyperlocomotion in the CLAMS assay up to 48 h. Moreover, acute administration of TJ-171 to mice 21 minutes after exposure to fentanyl dose-dependently and swiftly reversed MOR agonist-induced respiratory depression and hyperlocomotion, maintaining that protection against additional doses of fentanyl 12 hours later. In testing with mice chronically treated with morphine, both MOR antagonists naloxone and TJ-171 precipitated opioid withdrawal. Of interest, both antagonists demonstrated a therapeutic window, where withdrawal symptoms were correlatively reduced until and 3 mg/kg doses of TJ-17I compared to 30 mg/kg. Collectively, these results validate the development of selective bio-orthogonal MOR antagonists against fentanyl

University of Florida

Lost Homelands, New Beginnings: A Virtual Exhibition of Displacement and Resilience.
Miguel E. Bermudez

Dr. Christy Flanagan-Feddon

Migration has been a transformative force throughout human history, shaping cultural exchange, economic development, and conflict. "Lost Homelands, New Beginnings" examines how displaced communities navigate the loss of their homelands while preserving and redefining their cultural identities in the face of adversity. By comparing the forced displacement of Native Americans during colonization with the modern Venezuelan migration crisis, the exhibition explores universal themes of loss, resilience, cultural preservation, and hope.

Through the works of Carlos Cruz-Diez, Noah Billie and Jessica Osceola, as well as the photographs of Waleska del Sol and Cassandra Mayela's weaving, the exhibition invites viewers to engage with narratives of loss, adaptation, and hope. Organized around three themes—loss, identity, and hope—it delves into the profound loss of home, the fragmentation and reconstruction of cultural identity, and acts of resilience against assimilation.

The purpose of this exhibition is to demonstrate how art serves as a medium for remembering and reclaiming identity, fostering a deeper understanding of migration as a shared human experience. By weaving together historical and contemporary perspectives, "Lost Homelands, New Beginnings" highlights the enduring strength of displaced communities and their ability to preserve culture, assert belonging, and thrive in the face of profound challenges.

University of Central Florida

Assessing the Impact of Medicare Part D on Health Outcomes: A Post-COVID-19 Analysis
Minh Pham

Benjamin M. Craig

In 2006, Medicare Part D is introduced with the aims to provide prescription drug coverage to eligible Medicare beneficiaries and reduce the financial burden of medications. While extensive research has explored its impact on population health, its effects post-COVID-19 remain underexplored. This study uses data from the National Health Interview Survey (2019-2023) to evaluate the shift in health outcomes due to Medicare Part D enrollment, focusing on self-reported health status, communication, mobility, social functioning, cognition, self-care, and cost-related nonadherence. In particularly, time-series analysis is employed to assess these changes, while Propensity Score Matching (PSM) addresses selection bias to estimate the treatment effect of Part D enrollment. The research is expected to identify significant improvements in health outcomes and reductions in cost-related

nonadherence, particularly following the expansion of Medicare Part D post-COVID-19. These findings will provide valuable insights for health researchers and policymakers on the broader implications of Medicare Part D on population health.

University of South Florida

Enhancing Small Language Models with Retrieval Augmented Generation: A Big Data Approach

Minh Tam Nguyen

Dr. Yicheng Tu

Small Language Model (SLM) is trained on small, task-specific datasets to prioritize inference speed and efficiency. SLMs are often used with Vector Databases (VectorDB) as Retrieval Augmented Generation (RAG) to enhance response quality. However, as datasets scale to Big Data proportions, VectorDBs encounter performance bottlenecks due to their centralized architecture and complex similarity search. This paper proposes LogosDB, a distributed database designed for RAG. LogosDB comprises 3 components: multi-node LogosCluster, look-up table SumDB, and a dynamic Summarizer. In operation, Summarizer converts lengthy texts from LogosCluster into concise summaries in SumDB, creating a fast and LLM-friendly search interface. We then conducted performance tests using LLama 3.1 8B - a popular SLM from Meta. The benchmark compares how LogosDB and standalone Marqo VectorDB assist LLama's reasoning. The results are evaluated on Massive Multitask Language Understanding datasets (MMLU) across different capabilities: Multi-task Language Understanding, Mathematical Reasoning, and Multiple Choice Question Answering. The results demonstrate similar accuracy between LogosDB and VectorDB across Natural Science, Social Science, and Humanities datasets (53%, 66%, and 68% respectively). Notably, SumDB maintains a significantly low memory usage, storing 75% less data than VectorDB. This memory consumption shows minimal increases as data grows, being a sustainable solution for BigData. In conclusion, LogosDB's distributed architecture improves scalability and efficiency compared to centralized VectorDB. This optimization contributes to the practicality of SLMs in the information era. Potential research is to scale LogosDB beyond text-based content or to test LogosDB with smaller models.

University of South Florida

Investigating the Impact of Theory of Mind on Sarcasm and Empathy Detection

Miranda Kraenzlin

Dr. Nichole R. Lighthall

Cognitive abilities decrease with age, making it more difficult to execute higher-level functioning. Cognitive flexibility and attentional control are particularly affected, which may cause decreases in empathy. Empathy can be examined through Theory of Mind: the ability to attribute intentions and specific thoughts to others. Sarcasm is split into simple and paradoxical. Simple sarcasm, where the meaning is opposite of what is said, requires less cognitive acuity to understand than paradoxical sarcasm where the meaning is hidden in a paradox. Theory of mind is essential to processing sarcasm because it requires understanding others' intentions. The present study is under the Deciding Brains Study, which examines what neurocognitive mechanisms lead to deficits in trust-related decision-making. This was conducted through in-person computer-based sessions with older adults at the University of Central Florida campus. We utilized scores from the National Institute of Health Toolbox Dimension Change Card Sort Task (cognitive flexibility), The Awareness of Social Inference Test – Short, and the Affective and Cognitive Measure of Empathy survey. During preliminary analysis, we found that older adults performed better at detecting simple sarcasm compared with paradoxical ($t(60) = 6.413$, $p = .001$). This result supports previous findings as older adults, who have declining cognitive abilities, performed better on tasks requiring less cognitive acuity. This research propels our understanding of cognitive flexibility factors with the ability to distinguish sarcasm. It provides insight into scams and fraud detection based on their ability to detect sarcasm and empathy in others.

University of Central Florida

Using CRISPRi to Identify Optimal Target Profile for Beta-Lactam Antibiotics

Miriam Hinds

Dr. Kyle Rohde

Mycobacterium tuberculosis (Mtb), a bacteria that causes Tuberculosis, results in over 1.5 million deaths annually and is treated with a cocktail of four drugs over six months. Mycobacterium abscessus (Mab), which affects patients with pre-existing conditions such as Cystic Fibrosis, is a rapidly growing and drug-resistant pathogen. Mab, which

is a non-tuberculous mycobacteria (NTM), grows more rapidly and is more virulent than other NTMs. Bacteria in the genus mycobacteria are especially difficult to treat due to their highly impermeable cell wall. To identify targets for ß-lactam antibiotics, which can inhibit multiple peptidoglycan synthesis enzymes, I generated single CRISPRi knockdowns of L,D-transpeptidases (Ldts), enzymes involved in cell wall cross-linking. Mtb and Mab encode five Ldt homologs, each with distinct functions. Using CRISPRi technology and Golden GATEway multiplex cloning, I will simultaneously silence multiple genes and test Ldt combinations for synergistic interactions. Growth and viability will be monitored by spot plating to estimate CFU and optical density following anhydrotetracycline induction to identify priority Ldts for antibiotic targeting. With the goal of validating and prioritizing a class of cell wall cross-linking enzymes as drug targets in mycobacteria, I will determine which Ldt knockdown(s) will have the greatest inhibitory effect by itself and which combination(s) of Ldts will have the greatest synergy to define the optimal target profile for ß-lactams.

University of Central Florida

How the Age of Black Defendants and Victims Affects Mock Jurors' Decisions: A Look Into the Methodology

Miriam Mami & Abigail Heffner

Dr. Christine Ruva

This study examines the impact of defendant age (25 vs. 72) and victim age (26 vs. 70) on juror decision-making, with a focus on Black male defendants and victims. Previous research has shown that extralegal factors, such as age, can bias juror verdicts, but findings remain mixed, particularly concerning older individuals. Participants were hypothesized to give more guilty verdicts when the defendant was young (25) versus older (72) as well as when the victim was young (26) versus older (70). Utilizing Prolific, a sample of juror-eligible community members participated in a two-phase experiment. In Phase 1, participants completed a pretest measuring their belief in a just world (BJW). Five days later, in Phase 2, participants read a transcript of a carjacking and murder case with a Black defendant and Black victim and rendered a verdict. Results indicated significant main effects of victim age were observed, but only when participants that thought the purpose of the study was about defendant or victim bias were removed. Contrary to hypothesis two, participants were less likely to convict when the victim was younger (41%), compared to older (53%). There was no main effect of defendant age on verdict. The hypotheses were not supported, although victim age significantly influenced verdicts when participants who suspected the study was about bias were removed. These findings show the role of extralegal factors in juror decision-making and provide insights into age bias in Black defendants and victims, addressing gaps in the literature that have predominantly focused on White defendants.

University of South Florida

Investigating the Effects of Socioeconomic Status on Employment Associated with ADHD Symptoms

Mitali Chaudhari & Sneha Bhaskarla

Bethany Jowers

Attention-deficit/hyperactivity disorder (ADHD) is a chronic condition that impacts 2.5-6.7% of adults worldwide, resulting in cognitive and emotional difficulties that affect everyday actions, education, and employment. ADHD often leads to challenges in concentration, impulsivity, and emotional regulation, creating barriers to success in various aspects of life, particularly for individuals from lower socioeconomic backgrounds. These barriers are amplified by a lack of awareness and access to ADHD-related resources, which exacerbate the cycle of unemployment and poverty. This research aims to explore how ADHD impairs individuals' ability to thrive in the workforce, especially for those from disadvantaged socioeconomic statuses, and to evaluate a low-cost intervention to address this issue. Through the development and distribution of accessible mini-booklets containing vital ADHD information, coping strategies, and employment resources, we aim to bridge the knowledge gap. The booklets include information about ADHD types, symptoms, treatment options, as well as practical tools like stress management techniques, resume tips, and job interview strategies. This initiative seeks to alleviate the impact of ADHD on individuals in the workforce, helping them manage symptoms, enhance productivity, and break the cycle of economic instability. Ultimately, the project demonstrates the potential for community-based, accessible interventions to reduce the socio-economic challenges faced by individuals with ADHD. Moreover, it seeks to contribute to broader efforts in improving economic mobility and stability. Future research will focus on expanding the program and evaluating its long-term impacts on employment outcomes for individuals with ADHD.

University of South Florida

Therapeutic Approaches to Treating Chronic Traumatic Encephalopathy and Related Traumatic Brain Injuries

Musa Tumsah Tijjani

Dr. Gina O'Neal-Moffitt

Chronic Traumatic Encephalopathy (CTE) is a progressive neurodegenerative disorder linked to repetitive head trauma, often seen in athletes and military personnel. This disorder cannot be diagnosed while the individual is alive because the protein responsible for the condition is hidden within the brain tissue, which can only be examined through dissection of the brain after death. This paper reviews therapeutic treatments aimed at managing CTE and other traumatic brain injuries (TBI). The first study examined the effectiveness of person-centered active rehabilitation using a mixed-methods single-case design. While participants showed improvements in executive function and mood, the small sample size and external factors such as the COVID-19 pandemic limited the reliability of the results. The second study investigates the impact of animal-assisted therapy on cognitive and behavioral outcomes in TBI patients. The findings indicate significant improvements in the Rancho Los Amigos Scale and Levels of Command scores for participants in the intervention group compared to the control group. The results from this study highlighted the potential of animal-assisted therapy in treating TBI patients. Both studies and a literary review showcase the potential of personalized and therapeutic approaches to brain injury management and advocate for further research into expanding existing research.

Tallahassee State College

Tracing the Footprint of Contamination: Hillsborough County's Environmental History and Its Impact on Community Health through Case Studies

Natalie AmRhein

Dr. Katherine Alfredo

This presentation investigates the behavioral and health outcomes of different communities in Hillsborough County, Florida, through the lens of archival documents, spatial, and statistical analysis. As the Tampa Bay region continues to grow, understanding the health impacts of man-made built environmental hazards is imperative. This aims to update and expand upon previous studies by aggregating data and connecting historical events in Hillsborough County over the past century with sites like Superfunds and Brownfields.

Focusing on the case study locations of the Taylor Road area and East Lake-Orient Park, this study examines their history of environmental contamination, population changes, land use development, and impacts from major infrastructure projects like the I-4 corridor. Notably, the Taylor Road Landfill and Superfund site, a historic dumping site in Seffner, FL, spans 42.5 acres, with the adjacent Hillsborough Heights landfill covering 64 acres. Additionally, historical waste disposal sites as documented by the county complicates the area's environmental history. Using regression analysis and geospatial statistics, we explore the occurrence of high contamination with increased health risks. Through evaluation of land use changes in association with environmentally hazardous situations, we explore the impact of historical redlining using our case studies, scaling up to a county-wide evaluation. For additional depth, we digitized and incorporated data from the USF Special Collections archival and spatial data to provide a comprehensive analysis of the interplay between environmental land use, historic zoning, socioeconomic factors, and human health.

University of South Florida

Spaceflight Associated Neuro-Ocular Syndrome

Natalie Brattain & Ashley Lunt

Foram Madiyar

This project aims to develop miniaturized devices using nanotechnology and advanced materials like graphene and carbon nanotubes to continuously monitor physiological pressures, particularly intraocular pressure (IOP). Elevated IOP is a key marker in the diagnosis and treatment of Spaceflight Associated Neuro-ocular Syndrome, which is recognized as a health risk for NASA astronauts. Our approach involves designing a contact lens tonometer embedded with graphene-carbon nanotube nanocomposite films, which offer heightened sensitivity and real-time, non-invasive monitoring of IOP. Methods include the synthesis and fabrication of nanocomposite films, characterization of their mechanical and electrical properties, and integration into flexible contact lenses. Simulated ocular environments are going to be used to test the biosensors sensitivity and accuracy under dynamic pressure conditions.

Preliminary results indicate that the carbon nanotube films provide reliable and highly sensitive IOP measurements, outperforming traditional tonometry methods. These findings suggest that the contact lens tonometer could offer a more effective way to monitor IOP, improving

patient care for elevated IOP which can be seen in SANS or glaucoma. This research not only advances healthcare technology but also provides undergraduate students with valuable interdisciplinary research experience in biomedical engineering and materials science. The project contributes to future innovations in non-invasive medical devices, aiming to improve diagnostic accuracy and patient outcomes.

Embry-Riddle Aeronautical University

Can Low-Cost 3D Scanning Produce High-Quality Digital Images for Museum Paleontology?

Natalie Giraldo

Tina Kuhn

The use of 3D scanning technology has revolutionized paleontology, enabling the creation of precise digital replicas of fossils. This method reduces physical contact, minimizing the risk of damage, and allows for detailed examination of complex structures. The research involved one scanner, Revopoint, with its own software (RevoScan5), requiring a learning period to master. Initial practice involved scanning a replica of the Statue of David to refine techniques for manipulating light, depth, and color rendering, leading to improved scanning speed and quality. Despite these advancements, certain limitations persist. The scanner struggled with rendering depth in rocks and fossils that had undergone permineralization, and inconsistencies in color accuracy were noted. During the research, merging scans from different perspectives also presented challenges but were eventually resolved via rescanning, resulting in nearly flawless digital replicas of the fossils. This demonstrates that 3D scanning is a valuable tool for advancing paleontological research and can be effectively integrated into STEM practices. Its cost-effectiveness allows institutions with limited budgets to engage in advanced research, promoting inclusivity for scientists and students.

Miami Dade College

Towards Cryogenic Noise Thermometry in Nanostructures

Nathan Rao & Glen Romano Gillia

Dr. Dominique Laroche

In low-temperature physics, accurately characterizing a nanostructure's temperature is crucial for understanding the properties of its electron systems. Conventional methods of measuring temperature during experiments are often impractical for nanostructures due to their small size and thermal isolation. Researchers increasingly rely on lock-in amplifiers for noise thermometry measurements. Lock-in amplifiers, widely used in nanotechnology and materials science, are adept at detecting and measuring very small alternating current signals, even in the presence of much larger noise signals. The present study examines the use of lock-in amplifiers to sweep across a range of frequencies and measure the noise generated by devices. These frequency sweeps were carried out using a Python-based code developed specifically for the experiment. Analyzing data using large resistors at known temperatures helps evaluate the method's efficacy in extracting temperature values. The extracted temperatures matched the expected values at room temperature. Furthermore, at lower temperatures—when the resistor was immersed in liquid nitrogen—the measured temperature was consistent with the known temperature of liquid nitrogen. To determine the unknown temperatures of nanostructures within thermally isolated systems, it is essential that the findings align with current temperature benchmarks. These results provide a foundation for extending the technique to cryogenic temperatures and, ultimately, to the characterization of nanostructures themselves.

University of Florida

The Impact of Different Modalities of Mental Health Treatment on Drug Treatment Program Participation in Justice-Involved Adolescents

Nebiyou Daniel

Dr. Micah Johnson

Justice-involved adolescents (JIA) have high rates of mental health and substance use disorders (SUD). It is critical that JIA with SUD receive effective treatment to manage SUD and improve mental health outcomes. Evidence suggests that patients treated without mental health medication are more likely to relapse. Therefore, we hypothesize that patients receiving mental health medication, alone or with psychotherapy, will show higher rates of initiation and completion of drug treatment programs.

Logistic regression was used to analyze cross-sectional data from the Florida Department of Juvenile Justice (FLDJJ) on 22,568 JIA who reported receiving mental health treatment, including medication and/or psychotherapy. The FLDJJ sample consisted of male and female JIA arrested and administered the Positive Achievement Change Tool (PACT) intake assessment three

times, approximately 90 days apart. The effects of treatment methods on starting and completing drug treatment programs were tested.

Initial findings suggest that JIA with SUD receiving mental health medication are more likely to engage in drug treatment programs than those not prescribed mental health therapies. JIA prescribed only psychotherapy showed similar engagement levels to those without mental health therapies.

JIA prescribed mental health medication, alone or with psychotherapy, had higher rates of drug program initiation and completion. Future research could explore different types of mental health interventions and combined therapeutic strategies.

University of South Florida

Resveratrol Analogs: A New Frontier in Glioblastoma Stem Cell Therapy

Neha Jasti & Brianna Calderon

Regina Graham

Glioblastoma, a highly aggressive brain tumor, is grueling to treat due to its invasive nature and limitations of conventional cancer therapies: chemotherapy, radiation, and tumor resection. Glioblastoma stem cells (GSCs) are hypothesized to drive tumor growth, however, are key contributors to treatment resistance. Thus, highlighting the need for new targeting strategies to prevent tumor recurrence and improve survival. Resveratrol (RSV) is a polyphenolic compound found in the skin of red grapes. This compound has shown a variety of therapeutic benefits such as antimicrobial, anti-aging, anti-inflammatory, neuroprotective, cardioprotective effects, and blood-glucose-lowering properties. Despite its therapeutic promise, RSV's poor bioavailability limits clinical application. Recent research suggests specific meso-substitutions on RSV's aromatic rings could enhance its chemotherapeutic efficacy. To explore new approaches, this project investigates diarylacrylonitrile analogs, which retain the stilbene structure of RSV, for their potential cytotoxic effects on GSCs derived from both primary and recurrent patient tumors. Using Knoevenagel condensation, the project synthesized over 80 compounds, including several novel compounds. The purity of these compounds were assessed with TLC and characterized by NMR. Further, MTS assay revealed that methoxy-substituted analogs significantly reduced GSC viability while nitro-containing compounds promoted cell differentiation. Specifically, a methoxy-substituted compound, E03, displayed a ic50 value of less than 150 nM, indicating high potency and effectiveness in inhibiting GCSs. The RSV analogs are predicted to bypass the blood-brain barrier, a significant challenge often encountered by other glioblastoma therapies. These results indicate that these modified compounds hold promise for further development as potential therapeutic agents in glioblastoma treatments.

Nova Southeastern University

A Memory and Time Profiling Comparison of Different Processing Modes for the Divisive Amplicon Denoising Algorithm 2 (DADA2) Software

Neha R. Kashyap

Dr. Benjamin Callahan

Nucleotide sequencing is used to determine the exact sequence of bases in a DNA or RNA molecule, which allows scientists to glean important genetic information about the corresponding biological sample. Within microbiome research, sequencing data is used to elucidate bacterial diversity and genetic variation within complex microbial communities. However, the data will always contain some sequencing errors, which hinders our ability to identify different microbial taxa based on subtle sequence differences. The software package DADA2 solves this issue through denoising to produce unique, error-free sequences. DADA2 has three processing modes that are optimized for different types of study designs: independent, pooling, and pseudo-pooling. Pooling mode has the highest sensitivity to rare genetic variants, but is also the most computationally intensive and is challenged by large modern datasets. We hypothesize that the pseudo-pooling algorithm is a viable alternative to pooling for large datasets because it scales to require less processing time and memory to produce similarly high-quality results. Our goal is to capture and plot processing time and memory over number of samples for each DADA2 processing mode to compare the trends as the size of the dataset increases. The results supported our hypothesis, showing that pseudo-pooling scaled to take less processing time and memory compared to pooling. Our findings demonstrate that pseudo-pooling is a less computationally intensive method for resolving rare genetic variants for large datasets. Employing the pseudo-pooling algorithm will improve current sequencing data analysis approaches, positively impacting global efforts to study the microbiome.

University of Florida

A Systematic Literature Review on Water Quantity and Water Quality Modeling Tools

Ngoc Trieu

Mauricio Arias

Models are critical tools in water resources management, as they simulate physical processes and generate time-series data for key water parameters. Additionally, they enable analysis of climate and land-use impacts on quantity and quality of water, particularly for regions with limited observational datasets. While the variety of models provides flexibility to address diverse objectives, it also presents challenges in selecting the most suitable tool for specific case studies. Thus, this study aimed to synthesize recent research on watershed modeling and develop a tool to assist researchers and managers in selecting the most appropriate model for their specific objectives. Literature published between 2020 and 2024 were identified from Scopus. Manual screening methods and Random Forest machine learning techniques were employed to remove irrelevant studies from the initial dataset. From the remaining 438 papers, relevant data were extracted manually or with the Elicit AI tool, depending on the complexity and nature of the data required. Next, a Python-based meta-analysis highlighted the dominance of the Soil and Water Assessment Tool and its applications in addressing water quality challenges. Flow, total phosphorus, and total nitrogen were identified as the most evaluated parameters for water quality studies, with insights into the typical ranges of model performance. These findings provide a reference for modelers to assess simulation reliability. Future work will explore integrated modeling approaches, optimization algorithms, and strategies to address data availability challenges. This study offers a framework to support modelers in selecting appropriate tools for their contexts and purposes.

University of South Florida

The Need to Pass: An Analysis of Self-Worth and Societal Expectations

Nicholas Geller

Dr. David A. Rubin

Passing—for the transgender community represents being perceived as the gender in which they identify by cisgender and other transgender people. Typically, passing is desirable for those whose gender identity aligns with the hegemonic—dominant—presentation of binary woman or man. I argue that the value placed on passing amongst members of the transgender community creates a dangerous and unrealistic expectation of the transgender experience. Using Judith Butler's and Sandra Lee Bartky's analysis of gender as performative, along with the reality of violence against non-normative gender performance, I discuss why passing is desirable in the transgender community. Analyzing the reception of the public transitions of Caitlyn Jenner and Dylan Mulvaney, I discuss how passing relies on proximity to whiteness, socioeconomic status, and pretty privilege. Moya Bailey's theory of misogynoir, and its expansion into transmisogynoir, serves to demonstrate how passing is inherently based on Eurocentric beauty standards and is only afforded to those able to pass as white and cisgender. Ultimately, passing breeds transnormativity and transmedicalism, drives members of the transgender community to self-harm in their attempt to pass, and contributes to the denial of the right to be publicly transgender.

University of South Florida

Association of Language Preference and Food Insecurity Status within Caregivers of Pediatric Cancer Survivors

Nicholas M. Beskow

Marilyn Stern, PhD

Language preference has been linked to food insecurity, with previous studies identifying higher prevalence in Spanish-preferred households. While increased food insecurity has been observed in underserved Spanish-speaking cancer patients, there is limited research on caregivers of pediatric cancer survivors (PCS). This study aims to examine the association between language preference and food insecurity among caregivers of PCS. Survey data were collected from 94 caregivers of PCS. Participants completed a two-item Food Insecurity Screener and a demographic survey question indicating their preferred language (English or Spanish). A chi-square analysis was conducted to examine the association between language preference and food insecurity status. Participants mostly reported being female (93%), completed some college (27%) or achieved a college degree (25%), with a household income of >$70,000 (40%). Participants identified as predominately White (43%) and Hispanic (30%). Among participants, 40% were screened as food insecure and 23% reported being Spanish speaking preferred. The Pearson Chi-Square test indicated a significant association between language preference and food insecurity status ($^2(1) = 16.192$, $p = <.001$). This finding was further supported by the Fisher's Exact Test, which confirmed the significance of the association (p

= <.001 for two-sided). Caregivers of PCS who preferred speaking Spanish were more likely to experience food insecurity. These findings are consistent with the increased prevalence of food insecurity observed in other Spanish-preferred populations. This underscores the need for further research into bilingual food insecurity screening and targeted interventions for caregivers of PCS.

University of South Florida

Algorithms for Characterizing Motion-Based Energy Harvesting Reproducibility

Nicholas Rose

Dr. Kaitlyn Crawford

With energy demands estimated to double by 2050 and climate change creating pressure to reduce emissions, there's a need to develop alternative energy sources (US Department of Energy). To adapt to new energy requirements, scalable triboelectric devices—capable of converting motion into electrical output—are promising power supplies that have harvested energy from rotating tires to heartbeats. However, triboelectric generators (TEGs) struggle with reproducibility and variable power output. Further, characterizing inconsistencies can be challenging due to instrument limitations. This project addresses characterization challenges by developing algorithms to enhance existing equipment and track device reproducibility. The first algorithm enhances a widely used material science instrument by expanding its frequency capabilities and offering precise control over frequency, force, and distance variables. Triboelectric power output depends on these variables, so keeping them constant during each test is critical for measuring device reproducibility. The second algorithm measures voltage and current output consistency by automatically scanning the TEG's electrical output data. Current metrics focus on maximum current and voltage peaks. Alternatively, this program provides the average relative maximum and minimum peaks. We used this information to evaluate output consistency between three TEGs made with manufactured cellulose and Kapton tape, with a 99% confidence interval. While confidence intervals are the gold standard for comparing results in various fields, they are not commonly incorporated into TEG research. Applying this algorithm to past and future studies offers a quantitative look into how device modifications and manufacturing practices influence power generation, bringing us closer to producing reliable alternative energy harvests.

University of Central Florida

The Economics and Politics of Education: A Comparative Analysis of How Public Education Funding Leads to Long-Term Economic Growth and Political Stability

Nicole Ramos Lobato

Luiz Felipe Mantilla

It is widely recognized that education plays a crucial role in the overall development of countries. However, the specific mechanisms through which this institution generates such developments remain underexplored and not fully analyzed. This research aims to establish that, in a comparative analysis of governments, those allocating a larger percentage of their GDP to public education funding demonstrate better results in long-term economic growth and political stability than those with lower allocations. The analysis will focus on data presented by OECD (Organization for Economic Co-operation and Development) countries examining their expenditure in public education and corresponding economic growth and political stability over the past decade, both of which will be measured using the World Development Indicators drawn from the World Bank Group for quantitative analysis. A linear regression will be conducted to quantify this relationship between public education funding, the independent variable, and the two dependent variables, economic growth and political stability. Additionally, a qualitative analysis through process tracing will explore the underlying causal mechanisms that lead changes in public education fundings to affect long-term economic growth and political stability in countries. Conducting this study is a matter of extreme importance as it will show the causal relationship between investments in public education and the benefits they produce for society as a whole, both economically and politically. Ultimately, this will increase awareness of how critical it is for governments to strive for allocating bigger portions of their GDPs to public education funding, thereby fostering long-term economic growth and political stability.

University of South Florida

Art and Anatomy: The Use of Medical Wax Models in the Early Modern Period

Nicole Van

Ilenia Colon Mendoza

The use of human anatomical wax sculptures dates to the 15th century, marking a pivotal development in the intersection of art and anatomy. Anatomical manakins served as vital instructional tools for physicians navigating the challenge of complex

surgical procedures to patients in an era when anatomical knowledge was limited. Crafted from transparent and vibrantly colored waxes, these models featured removable layers of internal organs, providing a thorough representation of the human body's intricacy. Collaborations between sculptors such as Gaetano Zumbo and anatomist Guillame Desnoues furthered the exploration of organ functionality and its implications in disease causation. Italian sculptor, Clemente Susini, furthered the understanding of anatomy by producing the Anatomical Venus along with over 2000 models. Anatomy was given as a course study to students in Bologna where anatomist and wax modeler, Anna Morandi, began to reproduce detailed body parts such as capillary vessels and the oblique muscle of the eye which she discovered. Wax anatomical models advanced the discipline of medicine by aiding in discoveries and improving medical techniques. They were crucial for research and the training of physicians much in the way they are used today. Art and science came together in the service of medical education.

University of Central Florida

A Study of Cislunar Periodic Orbits in the Circular Restricted Three-Body Problem

Nicole Weeden Martins

Tarek Elgohary

Ever since NASA announced the Artemis program in 2019, the cislunar space, a region between Earth and the Moon, has attracted substantial research interest. Nonetheless, understanding the complex multipart physics that guides our solar system is not a new area of interest. The Three-Body Problem was first formulated by Lagrange in "Essai sur le Problème des Trois Corps" in 1772 and had additional refinements done by mathematicians like Poincaré. However, it was not until NASA's Apollo program that the cislunar space gained traction, and the Circular Restricted Three-Body Problem (CR3BP) model became more prominent. By deriving and explaining the necessary foundations for the CR3BP dynamics in a condensed and optimized manner, this research aims to assist individuals newly introduced to the field in understanding this complex topic. We will also study how the location, geometry, and period of an orbit are valuable parameters that can significantly decrease the fuel costs, transfer orbits time, and better communication with a desired location – Earth, Moon, or even Mars. Significant family of orbits, like the Near Rectilinear Halo Orbits (NRHOs) and Distant Retrograde Orbits (DROs), will be overviewed and analyzed based on their location, geometry, and period. All results gathered are validated by comparing the orbit's Jacobi constant, period, and geometry with NASA's Jet Propulsion Laboratory (JPL) website data.

University of Central Florida

First Report of Horsehair Worms (Phylum Nematomorpha) from Plethodontid Salamanders in North America

Nina Haag

Dr. Christina Anaya

The Plethodontidae family are a lungless salamander group that are mostly found in the Western Hemisphere. They play a significant ecological role consuming terrestrial invertebrates and are a food source to many small mammals and other invertebrates. Horsehair worms are parasites with a complex life cycle that use larval aquatic invertebrates and terrestrial arthropods to complete their life cycle. Previously published reports in other salamander families have identified the cyst stage of nematomorphs but it is unclear whether salamanders play a role in the life cycle of the Nematomorpha. The purpose of this study was to examine horsehair worm cysts in lungless salamanders. Larval salamanders were collected from various sites in Northern Georgia, stored in 70% ethanol, and stored in a -20˚C freezer until examined. Only the integument and the inner layer of collagen was examined for horsehair worms. The ventral and dorsal sections were examined for cysts by placing tissue on a microscope slide with coverslip and applying gentle pressure to flatten the tissue. The sections were then examined under an Olympus BX-51 compound microscope, at 100-400× magnification. Some samples had other sections examined (i.e., toes, head, and tail). We found 13/48 (27%) of salamanders contained horsehair worm cysts and had a mean intensity of 154.5 ± 274.5 (range 1-696). Because terrestrial insects are not likely to consume salamanders as prey, we suggest the Plethodontidae are accidental infections. To the best of our knowledge, this study is the first to identify horsehair worm cysts in the family Plethodontidae.

Florida Gulf Coast University

Treatment efficacy of receptor-targeted therapy in migraines

Niveditha Chandrakanth & Javier Todd

Dr. Libin Ye

G-protein-coupled receptors (GPCRs) are crucial in drug development due to their participation in various disease pathways. The calcitonin gene-

related peptide (CGRP) contributes to migraine pathophysiology through cerebral vasodilation and nociceptor activation. Emerging therapies targeting CGRP and serotonin (5-HT) receptors show promise in mitigating migraines, but their long-term efficacy requires further research. This literature review explores the role of CGRP and other receptors, including 5-HT, in migraine regulation, with a focus on their mechanisms and potential therapeutic applications. A systematic review of 42 peer-reviewed articles published within the past ten years was conducted, focusing on migraine pathophysiology and receptor-targeted treatments. Relevant studies were sourced from multiple databases, including PubMed, Google Scholar, and ScienceDirect, using keywords like "CGRP," "5-HT receptors," "migraine therapy," and "GPCRs." The analysis confirmed elevation of CGRP correlates with migraine manifestation. Clinical trials of CGRP antagonists like erenumab, fremanezumab, and rimegepant showed reduced pain severity for acute and chronic migraine prevention up to 50%. Activation of serotonin receptors, particularly 5-HT-1B, lowered CGRP release within the trigeminal vasculature of the meningeal spaces. Targeting these pathways, with CGRP antagonists and serotonin receptor modulators, presents a promising therapeutic approach. Results were consistent with the initial hypothesis of inhibiting the release of CGRP through antagonist medication treatment. Similar receptor-targeted therapies are effective clinically in psychiatric regulation and mood disorders which may be indicative of CGRP therapy's efficacy. Future studies should focus on large-scale clinical trials and explore potential side effects to fully establish the clinical utility of GPCR-targeted treatments for migraines.

University of South Florida

Isolation and Host Range Testing of Pseudomonas aeruginosa Bacteriophage from Florida Water Samples

Niya Patel

Daniel Czyz

Pseudomonas aeruginosa, a ubiquitous and opportunistic pathogen, is responsible for numerous infections, most notably pneumonia. P. aeruginosa is associated with 500,000 deaths annually worldwide, with 300,000 attributed to antimicrobial resistance (AMR). Recently, this pathogen has increasingly developed resistance to multiple antibiotics, including carbapenems, a class of last-resort antibiotics. As AMR grows alarmingly, public health officials have become increasingly wary of more bacterial strains developing resistance, underscoring the push for alternative therapies. Bacteriophages (phages), viruses that specifically attack and kill bacteria, offer an alternative to antibiotics in treating infections caused by P. aeruginosa. We isolated five novel P. aeruginosa phages from freshwater samples collected from various locations across Florida. Water samples were enriched with P. aeruginosa PAO1, a frequently used control strain, and plated using double-layer agar plating. After overnight incubation, the isolated phages were picked and replated multiple times to ensure complete homogeneity. Furthermore, the phages were purified using filtering methods and their specificity will be tested against a panel of 55 P. aeruginosa clinical isolates. Such host-range testing will reveal the specificity of our novel phages against clinical isolates of P. aeruginosa and can thus be used in further clinical applications against P. aeruginosa infection. The results of this research could be integral in advancing the development of targeted phage therapy for immunocompromised patients.

University of Florida

SNOW CRASH: How the METAVERSE enhances ADVERTISING for both COMPANIES and CONSUMERS

Noah J. Levin

Ms. Carol Osborne

As immersive technology becomes more streamlined and accessible to larger audiences, it is imperative for advertisers and buisnesses to understand and engage in new spaces where prospective consumers are gathered. The introduction of the metaverse, a virtual hub of experiences, commerce, and impressions, for consumers through revolutionary peripherals such as virtual and augmented reality represents a shift in how online users and brands are positioned within the digital space. This thesis analyses the industry space and how brands, researchers, and consumers are utilizing revolutionary technologies to reconceptualize the idea of commerce, interactivity, and self-expression. This report and research have largely been conducted by interviewing industry experts across the globe and attending Web3 conferences, including DCentral 2022 in Miami, Florida, and serves as a detailed guide for marketers and brands to the utility of the metaverse found in the decentralized layout, incorporation of digital assets and product authenticity, as well as the increased opportunities found in innovative marketing research and development.

University of South Florida

Few Places to Learn, Few Spaces to Talk: Reproductive Health Literacy Among Gen Z Women

Noelani Segree

Dr. Meredith L. Clements

The present study investigates reproductive health literacy among Generation Z women aged 18-29, focusing on their understanding of fertility and (in)fertility. Despite the peak fertility window for women occurring in their late teens to early 30s (Delbaere et al., 2020), existing research specific to women in Generation Z remains lacking, suggesting that young women lack knowledge about reproductive health (Martins et al., 2023). This study examines women's knowledge levels specific to fertility and infertility treatment using a modified version of Kudesia et al. (2017), Fertility & Infertility Treatment Knowledge Score Survey (FIT-KS). Results suggest a gap in knowledge specific to fertility and reproductive health among Gen Z women. Few spaces or places encourage dialogue specific to fertility, and those that do, such as a doctor's office, are still perceived as "uncomfortable" by some (26%), and 58% "never" to "rarely" discuss reproductive health with their doctor. Respondents were split between those who feel informed about their fertility (40%), those who do not (48%), and those who feel neutral (12%). More research is needed to define what "informed" means for Generation Z, to examine the information of Generation Z, and how to improve access to health education.

University of Tampa

Hispanic Patients with IBD who Underwent Bowel Resection are Less Likely to Receive All-Cause Opioid and Non-Opioid Agents used in Multimodal Pain Management

Nofel Iftikhar

Ellen M. Zimmermann

Effective pain management is critical for recovery after bowel resections and during inflammatory bowel disease (IBD) exacerbations. Due to opioid-related adverse effects, including impaired gastrointestinal motility and dependence, multimodal strategies incorporating non-opioid agents like antispasmodics, gabapentinoids, nonsteroidal anti-inflammatory drugs (NSAIDs), and tricyclic antidepressants (TCAs) are often employed. This study examined disparities in pain medication use across demographic groups to promote equitable healthcare practices. A retrospective analysis (October 2015–October 2024) utilized the Informatics for Integrating Biology and the Bedside (i2b2) tool and OneFlorida Data Trust. Patients with <2 ICD-10 CM codes for Crohn's disease (CD) or ulcerative colitis (UC) were identified. Bowel resections were determined using CPT codes for enterectomies and colectomies. Medications, which were identified using RXNORM codes, assessed included opioids (weak/strong), NSAIDs, gabapentin/pregabalin, antispasmodics, TCAs, and SSRIs. Post-resection analyses revealed racial/ethnic disparities in pain management. Hispanic patients were less likely than NHW patients to use weak opioids (OR 0.56, 95% CI [0.42, 0.74], p<0.0001), strong opioids (OR 0.41, 95% CI [0.33, 0.52], p<0.0001), gabapentin/pregabalin (OR 0.70, 95% CI [0.54, 0.90], p=0.005), antispasmodics (OR 0.73, 95% CI [0.54, 0.98], p=0.035), and SSRIs (OR 0.57, 95% CI [0.39, 0.82], p=0.002). TCA and NSAID use showed no significant differences, though NSAID use approached significance (p=0.071). These findings emphasize disparities in all-cause pain management among IBD patients undergoing bowel resections. Hispanic patients consistently used fewer opioids and non-opioid pain medications compared to NHW patients, despite similar resection rates. This trend may reflect differences in disease severity or healthcare access on a racial basis.

University of Florida

GPCRs in Psoriasis: The Role of CCL20 Chemokine Receptors in Skin Inflammation

Nora Eid & Darya Shirzad

Dr. Libin Ye

Psoriasis is a chronic, immune-mediated inflammatory skin disease that causes skin cell hyperproliferation and pruritus. The activation of certain G protein-coupled receptors (GPCRs), particularly chemokine receptors, play a role in immune cell migration and inflammation, linking them to the pathogenesis of psoriasis. The objective of this review is to evaluate the therapeutic potential of the CCL20 chemokine receptor in skin inflammation disorders like psoriasis. A systematic review of 24 sources from Pubmed was conducted using the keywords, "Chemokine signaling," "GPCR," "Th17 cells," "CCL20," "Psoriasis," and "CCR6." The CCR6/CCL20 axis is pivotal in psoriasis pathogenesis, driving Th17 cell migration and inflammation in affected tissues. Elevated levels of CCL20 have been observed in psoriatic lesions, highlighting its role in recruiting and activating immune cells, specifically T cells and dendritic cells. This increase in CCL20 contributes to the inflammation seen in psoriasis, making it a promising target for potential therapies for the condition. Targeting the CCR6/CCL20 axis in

psoriasis shows to be a promising therapeutic strategy. While recent studies have highlighted the potential of targeting this signaling pathway, the development of effective therapies remains in the early stages. Current treatment options fail to offer long lasting solutions, and more research is needed to develop sustainable, targeted therapies. This review highlights the CCR6/CCL20 axis as a possible therapeutic strategy for treatment of psoriasis. Further research can be done with this pathway in search of a long-term treatment for psoriasis and to clarify the complex interplay with other GCPRs and cell signals.

University of South Florida

From Boredom to Purpose: How Self-Concept Affects Motivation in the Workplace

Norma Sauri Cintron

Dr. Shannon Whitten

Every job includes tasks that employees find tedious. Some people seem to continue to maintain productivity during boring tasks, whereas others seem to get distracted and, therefore, are unproductive. The present research will investigate whether or not people with a positive self-image are better at handling boredom than those with a more negative self-view. It is predicted that those who feel good about themselves are more likely to stay engaged, find purpose in tedious tasks, and even make them more enjoyable. They're also expected to finish tasks more quickly and accurately. By exploring these ideas, this study aims to show that when we feel confident in ourselves, we can turn those dull moments into opportunities for growth and success. The goal is to understand an important influence on boredom management that may be useful in interventions by employers in the future.

University of Central Florida

Impact of Community Health Workers within Rural Dominican Republic

Olivia Pinilla

Dr. Holly Donahue Singh

The health care system of the Dominican Republic holds many facets, with the main one being how community health workers impact the complex network of medical treatments and diagnoses that patients receive every day. Community Health Workers within the Dominican Republic can consist of teachers or traveling nurses, yet they play a significant role within shaping medicine and the burden of diseases on rural populations. This analysis includes reviewed literature regarding the social and medical roles of community health workers within the rural Dominican Republic, specifically analyzing how workers perceive their roles within the complex healthcare network. This review will focus on reviewing current perceptions of a community health worker's role from a social and cultural perspective, which is a topic that can be further discussed potentially. These results will help when conducting first-hand interviews from community health workers themselves to gain a better perspective as to what they feel their roles entail within the communities they serve in. This program evaluation will help establish a more coherent bridge from humanities and public health, as the role of a community health worker changes depending on location. By focusing research within the rural parts of the Dominican Republic, there can be a more unique perspective as to what truly defines a healthcare worker and how it varies based on populations.

University of South Florida

Accuracy of Wearable Activity Monitors in Individuals of Different skin tones and BMIs during Exercise

Olivia Roeder & Alexis Smith

Dr. Jason Kostrna

Obesity and cardiovascular disease are known health concerns in the United States, particularly amongst African American and Hispanic populations. Cardiovascular monitoring applications and weight management programs rely on accurate measurements of heart rate (HR). Currently, photoplethysmography (PPG), administered via smartwatches, is the most common form of continuous HR monitoring, which uses green LED light to illuminate the blood flow through the skin. Recent studies identified potential inaccuracies in PPG HR measurements in individuals with higher body mass indexes (BMI) and darker complexions. Existing research limits our understanding of the effects of BMI and skin color on HR and caloric expenditure readings via smartwatches. Additionally, limited studies have evaluated the validity and accuracy of wearable devices during intense exercise. This study investigates whether different exercise intensities exacerbate device inaccuracies. We recruited a diverse participant pool (n = 50), including higher and typical BMIs and skin complexions (Fitzpatrick 3 – 5) to complete a well-controlled exercise protocol. Participants wore five of the most popular smartwatches (Apple, Fitbit, Samsung, Garmin, Empatica) and a Polar HR10 electrocardiogram

(ECG). The wearables HR readings were compared to the ECG to measure accuracy during different exercise intensities across skin tones and BMIs. The results of this study will allow us to learn more about the accuracy of wearables at higher intensity exercises among diverse populations, improving wearables' design and exercise recommendations.

Florida International University

BIN1: Significant Alzheimer's Risk Gene Mitigating Tau Propagation

Om Patel

Dr. Gopal Thinakaran

Bridging Integrator 1 (BIN1) is an adaptor protein found in neurons, microglia, and oligodendrocytes in the brain. BIN1 is the second-most prevalent genetic risk factor associated with sporadic Alzheimer's Disease. Neuronal BIN1 localizes to presynaptic terminals and play a role in excitatory synaptic transmission, whereas microglial BIN1 regulates neuroinflammatory activation. Previous studies highlight the necessity of neuronal BIN1 for hippocampal tau pathogenesis. However, the specific molecular mechanism underlying BIN1's function in tauopathy is still unknown. To investigate BIN1 function in trans-synaptic tau propagation in the brain, we applied stereotaxic unilateral hippocampal injection of mouse brain homogenates containing human pathogenic tau aggregates (tau seeds) into tau transgenic mice (PS19) followed by systemic analysis of tau pathology in serial brain sections. We found that minimal tau pathology was observed in 2-month-old un-injected PS19 mice but became evident in mice injected with tau seeds 60 days post-injection, confirming the spread of tau through connected brain regions. Interestingly, the loss of BIN1 expression in excitatory neurons of young PS19:Bin1 conditional knockout mice significantly reduced the propagation of tau pathology from the hippocampus to other cortical regions. Instead, we observed an accumulation of phosphorylated tau and pathological conformational tau in hippocampal CA1 pyramidal neurons in these mice, along with reduced activation of astrocytes. These findings suggest that excitatory neuronal BIN1 promotes the spread of pathogenic tau through connected brain regions and activates neuroinflammation. Therefore, targeting neuronal BIN1 could be a potential therapeutic approach for treating Alzheimer's Disease.

University of South Florida

Investigating the Impact of Artificial Sweeteners on Viability, Gastrointestinal Motility, and Cancer Metastasis Using Drosophila melanogaster

Om Patel

Dr. George Aranjuez

There is limited knowledge about the long-term effects of artificial sweeteners (AS) on human health. I am investigating how AS affects viability, gastrointestinal motility, and cancer metastasis, as these are strong indicators of health and are associated with AS in research. Drosophila melanogaster is used as a model organism due to their short generation time, low maintenance costs, and well-characterized genome. Viability was tested by rearing wildtype flies on media supplemented with various concentrations of aspartame and sucralose, then counting progeny produced. Various concentrations produced negative effects, with 10X being the most detrimental (-51% on aspartame and -40% on sucralose). A 10X concentration reflects ten times their reference concentrations. Gastrointestinal motility was assessed by measuring fruit fly excretion compared to flies on normal media. All tested AS concentrations increased excretion, with the highest excretion (+76%) caused by 100X aspartame. Metastatic effects of AS will be measured using the Ras-V12 model, a sensitized genetic background to detect carcinogenesis, to test whether AS enhance tumor growth or metastasis. Ras-V12 larvae will be raised on AS media, and cancer cell spread will be assessed. This study reveals the multifaceted impact of artificial sweeteners on viability, gastrointestinal motility, and potentially metastasis, emphasizing the need for further research to inform public health guidelines.

University of Central Florida

Comparative Genomics across Ganoderma Species to Identify Secondary Metabolite Clusters with Cytotoxic Properties

Omobolanle Ayangade, Abril Chao, Emily Abraham, Maya Pasapuleti & Fatima Muhammad

Navi Gill

Fungi in the genus Ganoderma have been widely studied in Chinese culture for their medicinal properties and promoting overall health and longevity. Our prior work on eight Ganoderma species showed that they contain Secondary Metabolite Clusters (SMCs) that

code for multiple terpenes, betalactones, and ribosomally synthesized and post-translationally modified peptides (RiPPs). These compounds are well known for their cytotoxic and anticancer potential. A specialized bioinformatics analysis tool, antiSMASH1, was used to identify and annotate SMCs that produce anticancer compounds in the eight Ganoderma genomes. To test the results obtained from the bioinformatics analysis, fungal extracts were prepared from G. lucidum and G. tsugae by air-drying and powdering the mushroom fruiting bodies, mixing them with 95% ethanol, followed by lyophilization. Different dilutions of these extracts are being used for proliferation assays on two cancer cell lines, PN528 (Proneural) and patient-derived GSC20 (Glioblastoma stem cells) to assess the cytotoxicity potential of the fungal compounds. Cell counts will be performed along with the assessment of stem cell and apoptotic markers with an expectation that the stem cell and apoptotic markers will be elevated in treated cells. Survival analysis will be performed to evaluate and compare the survival rates of cells over time. In addition, comparative transcriptomic analyses will be performed to identify differentially expressed genes/pathways followed by qRT-PCR. The promise of this study lies in establishing the pharmaceutical and nutritional role of natural products from the genus Ganoderma and creating opportunities to develop market-ready health products.

Nova Southeastern University

How COVID-19 impacted the physical and mental health of Latino/Hispanic college students before, during, and after the pandemic.

Ornella Vintimilla & Dr. Fernando Rivera

This study analyzed how COVID-19 impacted the physical and mental health of Latino/Hispanic college students before, during, and after the pandemic. Data were collected using a 35-question anonymous online questionnaire in which students provided information about their experiences with COVID-19. A total of 50 Latino/Hispanic college students completed the questionnaire. Findings suggest that student mental health ratings have not returned to pre-pandemic levels. At the same time, during the pandemic, there was an increase in the symptoms of anxiety, sadness/ depression, and feeling overwhelmed. Future research will expand and compare the preliminary results with those of other Latino/Hispanic students in Central Florida. The overall goal of the investigation is to increase awareness about the impact of COVID-19 and identify its effects on the physical and mental health of this segment of the student population.

University of Central Florida

Scanning Nearfield Optical Microscopy of Polymers

Oscar Sang

Alfons Schulte

This project combines vibrational spectroscopy with a scanning near-field optical microscopy (SNOM) that employs a sharp tip for spatial resolution in the 20-nanometer range. The nanoscale structure is the key to understanding the functionality and deterioration mechanisms of a polymeric blend. It is irrelevant how the polymers are blended, if they are contaminated, or have any kind of previous deterioration. Polymeric blends can be probed below the diffraction limit by scattering light off a very sharp tip in nearfield proximity to the sample. These interactions allow the tip to trace the physical structure of the sample while simultaneously using the scattered light to give chemical information via spectroscopy. We investigate a PVAC:PS polymer, a blend of both PVAC and polystyrene, both giving very distinct chemical signatures. We further investigate polymers relevant for organic solar cells.

University of Central Florida

Uncovering the Impact of Defaunation on Amazonian Snakes

Owen McCool

Dr. Therese Lamperty

Defaunation, the local declines of large-bodied mammals from a region, is becoming more widespread across the tropics. Specifically, it has been an area of concern for the Amazon rainforest in recent years as a result of overhunting. Current research shows that these losses of large mammals can lead to increases in the abundances of rodents and other small mammals, the prey of many snake species. Consequently, defaunation may lead to increased abundances of some snakes, which could indirectly impact other herpetofauna they consume. However, defaunation's effect on snakes and other components of the herpetofauna food web (e.g. snake prey such as lizards) remains unexplored in tropical forest ecosystems to the best of our knowledge. To address this gap, we conducted visual encounter surveys at two different field sites in the Ecuadorian Amazon, one with defaunated conditions and one that was faunally-intact. We identified all snake, frog, and

lizard species encountered during two months of surveys and estimated their abundances, species, and feeding guild diversity and composition. Preliminary results indicate greater abundances of small mammal-eating snakes associated with defaunation, while the faunally intact site had a higher diversity of non-mammal eating snake species. The continued analysis into this project will be crucial to understanding how a widespread phenomenon affects an important, and often overlooked, group of animals. Snakes serve vital roles as both predators and prey in many of their habitats, and understanding the top-down effects of defaunation can provide insight into future conservation efforts.

University of Florida

CyberGator: A Resilience Assessment Framework for Adaptive Cyber Defense against Advanced Persistent Threats

Ozlem Polat

Dr. Cheryl Resch

The rise in cyber threats targeting critical infrastructure has intensified the need for resilient systems capable of adaptive responses to sophisticated attacks. CyberGator addresses this challenge by providing a comprehensive framework to evaluate and enhance the resilience of complex systems under Advanced Persistent Threats (APTs). This framework integrates system architecture, hardware and software components, known vulnerabilities (CVEs), and environmental factors with Bayesian networks, Finite State Machines (FSMs), and other mathematical models to simulate the impact of cyberattacks. CyberGator dynamically scores resilience and assesses recovery pathways to produce actionable insights that prioritize defensive measures and quantify operational risks for system hardening strategies. Building on this foundation, the next phase incorporates machine learning (ML) algorithms to predict resilience degradation patterns, optimize recovery strategies, and refine automated assessment processes. By training AI models on simulated attack scenarios, the framework adapts in real time to evolving threats, offering a scalable solution for diverse systems. This research advances cyber resiliency by automating assessments, informing acquisition decisions, and enabling system operators to deploy the most effective cybersecurity solutions. CyberGator aspires to aid in the development of autonomous systems that not only withstand adversarial attacks but also evolve in response to emerging cyber threats, contributing to the advancement of resilient cyber defense architectures and automated security interventions.

University of Florida

Correlation Between Beck's Depression Inventory Score and Cardiovascular Reactivity During Submaximal Exercise in Young Adults

Pannonica Silvestri

Dr. Joseph Watso

Cardiovascular disease is the leading cause of death worldwide. Major Depressive Disorder (MDD) is associated with higher cardiovascular disease risk. Previous work found that greater depressive symptoms were associated with greater cardiovascular response (CVR; blood pressure & heart rate) during the cold pressor test - a physical stressor. However, it's unclear whether depressive symptoms are associated with CVR during dynamic submaximal exercise. Purpose: We tested the hypothesis that more severe depressive symptoms are associated with higher CVR during dynamic exercise in young otherwise healthy adults with and without obesity. Methods: Depressive symptoms among adults were assessed using Beck's Depression Inventory (BDI; scores: 0-9 minimal, 10-28 mild, 19-29 moderate, ≥30 severe). We measured CVR (Δ from rest to final 2 minutes of cycling) using heart rate (electrocardiogram) and beat-to-beat hemodynamics (finger photoplethysmography) during six minutes of constant load cycling at 50 watts with cadence fixed at 60-70 rpm. We report data as mean[SD] or median[IQR]. Results: The participants (n=31) were 24[6] years old with a body mass index of 31.6[9.4] kg/m2. The BDI score (4[8]) was inversely weakly correlated with Δsystolic blood pressure (27±13 mmHg; =-0.39, P=0.04), but not with Δheart rate (31[16] bpm; =-0.11, P=0.54), Δstroke volume (25±21 mL; =0.10, P=0.62), Δcardiac output (5027±1801 mL/min; =0.08, P=0.69), or Δtotal vascular conductance (34.2[26.2] mL/min/mmHg; =0.10, P=0.64). Conclusion: These preliminary data suggest that higher depressive symptom scores, despite being generally minimal/mild, are associated with lower systolic blood pressure responses during submaximal cycling exercise among young otherwise healthy adults with and without obesity.

Florida State University

The Role of Vacancies and Crime in Determining Home Prices

Parker Ridaught & Eliza Terziev

Crystal Taylor

Neighborhood characteristics, such as vacancies and crime rates, influence community growth, resilience, and the cost of homeownership. Home prices serve as one indicator of a neighborhood's perception. Prices are influenced by both standard home characteristics and locational factors such as community desirability. Building on literature studying the role vacancies and crime play in a community's housing market, we ask the following: What role do homeowner vacancies and crime rates play in predicting a home's sale price when controlling for other relevant factors? Using 2022 tax roll data from the Leon County Property Appraiser, 2021 ACS Data, and 2022 crime data from the Tallahassee Police Department, we run a model predicting sale price that, in addition to typical housing characteristics, includes home vacancies and crime (property and violent) as explanatory variables. We also explore whether the effect of vacancies in an area depends on property and violent crime rates by introducing an interaction term to our model. Results suggest that home prices, on average, are lower in areas where vacancies are higher. We find that higher rates of violent crime are associated with lower home prices, while higher rates of property crime are associated with higher sale prices. We also find that the effect of homeowner vacancies on sale price may depend on the level of violent and property crime in an area. Results suggest that lower home prices do not guarantee prospective residents are better off and policy discussions on home affordability should address the desirability of neighborhoods.

Florida State University

Proteomic Profiling of Tribolium castaneum via Stearoyl and Oleoyl Fatty Acid Amide Probes

Patrick Jessup

Imani McCalla

The role of Fatty Acid Amides (FAAs) in biological processes has only been explored on a small scale, yet their presence in a wide variety of organisms indicate there is more to be discovered. My research involves the interaction between various fatty acid analogs and the model proteome of Tribolium castaneum using a process known as Binding-Based Proteomic Profiling (BBPP). Stearoyl and Oleoyl fatty acid amides are functionalized with diazirine groups, allowing for strong covalent bonding between probe and the target proteins upon UV exposure. Alkyne groups on the fatty acid probes allow for tagging with either biotin or a fluorescent dye through a click reaction. Tagged proteins can then visualized or be isolated via an avidin column, allowing for specific isolation of proteins interacting with the probes. Enriched protein samples are analyzed through LC-MS for characterization and comparison to orthologs in other species. With BBPP, the role of various FAA in biological process can be better understood,by examining their interactions within the proteome of model organisms.

University of South Florida

Investigating the Influence of Canvas Mastery Paths in General Chemistry

Paula Libos

Nicole Lapeyrouse

Mastery Paths (MP) is a differential tool incorporated into the Canvas learning marketplace. MP is an adaptive instructional system that customizes students' learning experiences by providing differentiated learning pathways based on students' subject-matter mastery of a topic. Incorporating MP into a course offers an adaptive learning online homework system that is no-cost-to-students. The following presentation will focus on using MP in a first-semester general chemistry course. These MP modules were created based on specific topics covered in the course to help students master these topics. For this course, MP was an optional tool students could use and was not mandatory. The importance of this research is to analyze the effectiveness of the Mastery Paths program on student performance on high-stakes assignments. Statistical analysis was made using SPSS software, comparing the results of students who engaged with the MP modules to those who did not utilize it. The results predicted preliminary positive results in which greater time spent using this resource was associated with higher performance on the overall quizzes and exams. This presentation hopes to further explore MP's impact on students' performance and add to the literature on this no-cost-to-students adaptive learning homework system.

University of Central Florida

Age and Health Predictors of Cannabis Substitution for Alcohol Among Women

Paula Martinez de Pinillos, Dinamaris Aguilar, Radhika Venkatesan & Maiara Fascina

Dr. Karina Villalba

Introduction: Research has highlighted adverse health effects of alcohol, particularly among older women, who are more susceptible to alcohol-related consequences. The increasing trend of alcohol consumption among women of all ages, combined with known therapeutic benefits of cannabis emphasizes the need for research into the substitution of cannabis for alcohol. Methods: A cross-sectional survey was completed by 413 adult women, stratified by age at 56 years old, who reported any lifetime cannabis use. The primary outcomes were the likelihood of substituting both CBD and THC products, CBD alone, or THC alone for alcohol. Logistic regression models were used to examine multiple predictors of cannabis substitution, including depression, anxiety, and PTSD symptoms, as well as sleep problems, stress coping difficulties, health status, and severity of alcohol use. Results: The younger group (mean age = 44.2 years) was significantly more likely to substitute THC for alcohol than the older group (mean age = 62.9 years). Poor health and alcohol use severity predicted the substitution of both CBD and THC for alcohol among younger women, while PTSD symptoms and alcohol use severity were significant predictors among older women. Additionally, sleep problems were a significant predictor for THC substitution in both age groups. Conclusion: Women with PTSD, sleep issues, health problems, and more severe alcohol use may be most amenable to using cannabis as a harm reduction strategy to reduce alcohol consumption. The low substitution rate of CBD for alcohol indicates a continued desire for the psychoactive effects of THC.

University of Central Florida

The Impact of Gender and Ethnicity on Subgroup Formation

Payton Wolnik & Livia Nogueira

Dr. Shawn Burke

Interpersonal connections significantly influence team dynamics in any organization. While the effect of differences between team members (e.g., in gender and race) has perhaps received more attention (e.g., Aron et al., 1997; Ro & Choi, 2011), it is also essential to understand that shared characteristics between members can shape subgroup dynamics and impact teamwork (Hornsey & Hogg, 2000). Although deep-level characteristics (e.g., shared values) are considered more critical for bonds than surface-level traits (e.g., gender; Bell et al., 2018), subgrouping by gender and race persists. This study explores how such subgrouping affects team performance in collaborative settings. In a laboratory study (N[teams] = 74), the Fast-Friends Paradigm (Aron et al., 1997) was utilized to induce the disclosure of personal information related to values between random pairs of participants. Following this 20-minute dyadic discussion, two pairs of participants were united to play two rounds (~20 min each) of a collaborative, interdependent 4-person board game, "Ravine." To answer the research question, we (1) analyze the effect of shared/mixed-gender Fast Friends partners on the evaluations of different crew members after the collaborative game rounds; and (2) analyze the impact of these pairings on overall team performance. The findings will shed light on if tools such as the "Fast-Friends Paradigm" can be used to foster connections amongst team members, and the impact of factors like shared demographics in the effectiveness of team collaboration. This is significant for understanding how organizations can optimize team performance in diverse, high-stakes environments.

University of Central Florida

An Evaluation of the Effect of Gender on Perceptions of Analysts in the U.S. Intelligence Community

Pedro Armona & Samuel Mallay

Kelsey Larsen

Existing research has consistently showed that visual perceptions of gender fundamentally influence how voters view political candidates' competence—often biasing them to identify male candidates as having more expertise on matters such as national security, and to vote for those candidates as a result. However, by focusing on electoral politics, past research overlooks roles in which individuals necessarily all have the same level of expertise. What about when intelligence analysts are hired by the government because they are qualified for the position based on the merit of their knowledge? Do gender biases exist even when individuals' national security credentials are proven and equalized? This project aims to answer this question through an online survey experiment. Specifically, students at the University of Central Florida (UCF) will receive one of three treatments in a Qualtrics survey: they will be presented with visual depictions of all-male intelligence teams, all-female intelligence teams,

and gender-neutral intelligence teams. Then, they will identify their overall perception of each team's competence, in addition to information on other demographic factors. In doing so, these students will demonstrate whether the gender biases of the campaign trail extend to the war room—and what that means for the future of the U.S. Intelligence Community.

University of Central Florida

Monoids Motivated by DNA Origami

Peter Alspaugh

Natasha Jonoska

DNA Origami provides a method to create DNA nanostructures, which have been proposed to be used as scaffolds for nano-electronics and as means for drug delivery systems that can naturally interact within cell environments. Various structures have been experimentally created, including 2D arrays and 3D curves and meshes. However, a mathematical framework and theoretical understanding of DNA Origami shapes and structures is still lacking. A DNA Origami structure consists of a single long cyclic strand called a "scaffold" and numerous short strands complementary to various locations of the scaffold called "staples." By designing precise annealing locations for the staple strands, the scaffold may be forced to fold into a desired shape. We propose an algebraic system to describe varying staple arrangements within a rectangular fold of the scaffold. For each arrangement, we associate an element of the algebraic system, which we name the Origami monoid, and design its operation to represent concatenation of graphical representations of the origami shapes. We construct the monoid by doubling the generators and relations of the well-studied Jones monoid, then adding relations that describe plausible modifications to DNA Origami nanostructures. We prove several algebraic properties of the Origami monoid, including restrictions on the forms of its elements, facts about its Green's classes, and we find and prove an unexpected occurrence of contextual partial commutation between certain generators of the monoid. Besides possible applications to DNA Origami, our approach also provides new ways to build and study algebraic structures.

University of South Florida

Differences in Heat Tolerance within Coral Algal Endosymbionts

Peter Fisichella

Dr. John Parkinson

The rise in sea surface temperatures and projections of further climate change threaten biodiversity and could have detrimental effects on corals. Corals have responded variably to increases in environmental temperatures; these differences may be due to genetic variation. Marine dinoflagellates (Symbiodiniaceae) serve as symbionts for corals and may allow corals to acclimate to higher temperatures; heat tolerance within and between Symbiodiniaceae genera could be different. We wanted to test if Symbiodiniaceae species underwent different amounts of stress due to a heating event. To simulate a heat stress event, coral endosymbiont cultures were held at ambient temperature for nine days. Cultures then underwent the simulated heat stress by increasing the temperatures by 1 per day until the maximum temperature (32). We measured Photochemical efficiency (Fv/Fm) using Pulse Amplitude Modulation (PAM) fluorometry to assess the stress levels of the cultures. Fv/Fm was compared for overall health before and after heat stress. The cultures had Fv/Fm values between 0.6 (healthy) and 0.01 (very stressed) demonstrating strains incurred different amounts of stress from the treatment. The genus Symbiodinium had the most variation within a genus, while Fugacium showed little variation within-group compared to other genera with more samples. Results suggest there are differences present within genera that might allow some strains of Symbiodiniaceae to maintain activity even with rising sea temperatures and could allow corals a better chance of survival. This research may be used to further investigate tradeoffs of heat tolerance and how biodiversity can be maintained through climate changes.

University of South Florida

"Problemas sencillos": Perspectives on mental health disparities among working-class Latinas

Peter Kyriacou

Elena

In this study, I focused on mental health disparities among working class Hispanic women. In particular, I sought to explore the

emic perception of these disparities. There has been existing literature identifying the leading factors behind these differences. While these have served as a foundation to my efforts, this research does not address how these factors are perceived by Hispanic women. Perception varies between groups, and is influenced by cultural and socioeconomic factors. Although researchers correctly strive towards subjectivity, the form in which societal biases influence perception is important when understanding specific populations. Identifying a problem does not mean that it is perceived as such by those affected. Understanding how the factors causing disparities in access to mental health services are perceived by Hispanic women could be critical to understanding why these disparities persist. In addition, by understanding how these issues are actually seen, an integrated, community based approach can be taken to solving this problem in the future.

University of South Florida

What are 'Western values': Defining the Western canon in higher education humanities

Peyton Harris

Dr. Anna Peterson

The humanities are a broad set of ideas and disciplines, subject to many different interpretations. However, their overlying purpose is to provide insights about diverse human experiences and to teach students critical thinking skills so that "you can see the underlying supplemental messages that are like being sent through different forms of rhetoric," as one first-year student I interviewed said.

Within the humanities, the Western canon is broadly defined as a set of works and ideas contributing to Western culture and philosophy. As a part of Florida Senate Bill 266, updated Florida statutes, specifically provisions 1007.25 and .55, dictate that general education humanities courses "must include selections from the Western canon" and "Whenever applicable, provide instruction on the historical background and philosophical foundation of Western civilization and this nation's historical documents." The results of the general education review removed 702 of 1,181 general education courses, including Women in the Modern U.S., History of the Second World War, Religion and Violence, and Introduction to African American Studies.

This paper examines the meaning of the "Western canon" and how this legislation influences higher education in the humanities. Through a qualitative and quantitative analysis, this study explores varying interpretations of the Western canon and its influence in the classroom, the importance of global perspectives in the humanities, its religious influence, and the impacts of Florida education legislation. Ultimately, this research seeks to explore the shifting landscape of educational standards that may occur nationally.

University of Florida

Efficient Quantum State Estimation Through Adaptive Bayesian Measurements

Phillip Cornett

Kwang-Cheng Chen

Quantum computers rely on the quantum state of qubits, represented by probability distributions, to conduct computations. To know the outcome of a computation, the quantum state of the qubit must be measured, which only returns one outcome from the probability distribution. Obtaining reliable outcomes often requires repeating computations and measurements numerous times, making the process time consuming and resource intensive. Developing more efficient measurement strategies is essential to addressing this challenge and enhancing the practicality of quantum computing. Our work leverages Bayesian inference alongside principles from information theory, sequential detection, and statistical signal processing to develop an innovative measurement scheme. Creating an adaptive measurement scheme with these tools, our method dynamically adjusts measurement strategies based on the information gained at each step. Starting with complete uncertainty about the qubit's state, measurements are targeted where they are most informative. This adaptive approach enables faster state estimation compared to traditional methods. Simulations in Qiskit demonstrate the effectiveness of this method, showing substantial reductions in the number of measurements required to achieve consistent outcomes. This work addresses a critical barrier to practical quantum computing, contributing to the development of scalable quantum technologies. By optimizing the measurement process, we bring quantum computing closer to real-world applications, paving the way for solving problems beyond the reach of classical systems.

University of South Florida

Mild and Efficient Cs_2CO_3-Promoted Synthesis of Silyl (Dithio-)Carbonates and Silyl (Dithio-) Carbamates

Phillip Gray III & Colby Lavigne

Dr. Ralph Salvatore

Silyl carbamates/dithiocarbamates and carbonates/dithiocarbonates are ubiquitous compounds that hold a wide array of use as pesticides, serve as novel protecting groups, and possess interesting medicinal applications as peptidomimetics. Their biological applications include an introduction into partial structures of drugs to improve their efficiencies. A novel phosgene-free method and environmentally benign synthesis of silyl (dithio-)carbonates and silyl (dithio-)carbamates were developed via a three-component coupling of an amine or alcohol, carbon dioxide (carbon disulfide), and a trialkyl or triarylsilyl halide. Cesium carbonate promoted not only successful carbonylations of alcohols and carbamations of amines, but also suppressed common side reactions traditionally seen using existing protocols. Various alcohols and amines were examined, using a wide array of trialkyl-, triaryl halides, or sulfonates, respectively. In the future, a solid phase synthesis of the title compounds will also be investigated.

Southeastern University

Misdemeanor (In)Justice

Phoenix Ricketts

Dr. Jennifer Copp

Past research has highlighted a series of concerns related to the misdemeanor court system in the United States, including examples of how these lower courts have strayed from intended practices, thus contributing to violations of due process and injustices. Relative to more serious crimes, misdemeanors receive less public attention; however, the collateral consequences of misdemeanor court involvement affect the lives of individuals across multiple domains. In the current study, we aimed to explore the misdemeanor court system in a single judicial circuit in Florida to address the following questions: 1) To what extent are misdemeanor courtrooms complying with the law and 2) What factors, if any, contribute to non-compliance or potential sources of unfairness? Members of the research team attended misdemeanor arraignments and criminal traffic court and completed observation forms that monitored the process and outcomes of the court for each defendant on that court docket. Data was cross-checked with public records, including court dockets, and was analyzed and summarized in a report. The observations revealed considerable variability across courts and court processes, especially in smaller counties. This project was conducted in collaboration with the public defender's office. In addition to contributing to the literature on the extent and nature of due process violations in the lower courts, our broader objective was to share our findings with a broad range of local stakeholders to raise awareness and facilitate discussion on how some of the concerns identified may be appropriately addressed.

Florida State University

Assessing Sublethal Toxicity on Lipid Regulator of Atorvastatin in Embryonic and Larval Zebrafish (Danio rerio)

Phyllis Wah

Christopher Joseph Martyniuk

Atorvastatin is a cholesterol-lowering statin medication for humans that works by inhibiting the enzyme 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) reductase. While this pharmaceutical is bioavailable to marine organisms, its potential toxicity to them is not well characterized. In my research, I conducted RNA-seq and measured sub-lethal developmental and behavioral-related endpoints in zebrafish to identify toxicity mechanisms related to environmentally relevant exposures. Atorvastatin did not impact survival, hatch success, or deformity frequency in zebrafish larvae. At the molecular level, RNA-seq revealed 1 µg/L atorvastatin affected the expression of collagen type I, alpha 1a, fatty acid desaturase 2, alpha M integrin (complement component 3 receptor 3 subunit), and prolactin while 100 µg/L atorvastatin altered genes like solute carrier family 12 (potassium/chloride transporter), member 5b, G protein subunit alpha z, lysine (K)-specific demethylase 6B, and growth hormone 1. Examples of gene sets altered by 1 µg/L atorvastatin included B-Cell Chronic Lymphocytic Leukemia, CD8+ T-Cell Activation, and TNF -< NF-kB Expression Targets while 100 µg/L atorvastatin altered pathways associated with Th17-Cell Activation in Crohn's Disease, Oxytocin Signaling in Brain Nerve Cell (Hypothesis), and V(D)J Recombination. Data for survival statistics, gene expression, and behavioral activity will be presented. This study improves knowledge regarding the relative toxicity of atorvastatin to marine species to improve risk assessment strategies for statin drugs.

University of Florida

Analysis of Chemistry GTA Attitudes on Inclusive Classroom Practices

Pocahontas Halperin

Dr. Erin K. H. Saitta

At the university level, instruction in STEM education sees continuous constructive refinement to better support versatility in student learning. Despite these efforts, many classroom curriculums still are not inclusive to all learners - especially students with disabilities, leaving them underrepresented in STEM programs.

This highlights the need to take deeper analysis in how Universal Design for Learning (UDL) is implemented in chemistry classrooms - an aim our study revolves around. We look to examine how Graduate Teaching Assistants (GTA) consider inclusive practice in the undergraduate lab setting. This study surveyed accounts from 127 GTA chemistry perspectives where participants revealed their attitudes, behaviors, and approaches to teaching regarding course accommodations, materials, and modifications in the context of lectures, classrooms, and assessments. In particular, participants responded to a series of questions addressing their personal policies, beliefs and frequency of implementation. Additionally, demographic information—GTA backgrounds in teaching students with disabilities and interpersonal experience with disabilities—were used to provide context for analysis.

This research aims to discover existing relationships between demographic factors and UDL approach tendencies. In doing so, current teaching practices can be understood to be refined for inclusive department learning, lowering and ultimately eliminating existing academic barriers for students with disabilities. Findings can lead to improved GTA training and faculty professional development to foster an academic environment where every student, inclusive of disability or learning variation, is successful - not solely limited to the chemistry department, but for all other STEM fields as well.

University of Central Florida

Non-Canonical Relaxin Receptor Agonism to Treat Vascular Calcification

Polina Evdokimova

Dr. Joshua Hutcheson

Vascular calcification, the deposition of bone-like mineral in the artery wall, is the most significant predictor of cardiovascular morbidity and mortality. Calcification begins when vascular smooth muscle cells acquire an osteogenic phenotype similar to one observed in bone tissue. Although it directly contributes to diminished cardiovascular function, no therapeutic options exist to prevent or treat vascular calcification. Preliminary data in our lab have demonstrated that agonism of the relaxin receptor inhibits osteogenic changes in vascular smooth muscle cells and subsequent mineral deposition. The relaxin peptide, however, is not well suited for therapeutic development due to its low bioavailability. In collaboration with National Institutes of Health investigators, we have identified a series of small-molecule relaxin agonists. The agonists were screened based on their ability to activate signaling traditionally downstream of the relaxin receptor. Our data indicate that the anti-calcification effects of these small molecules may not directly correlate with the activation of traditional relaxin signaling. In this study, we will investigate the mechanisms associated with non-canonical relaxin receptor inhibition of vascular calcification and further explore the therapeutic potential of these small molecules. This research focuses on uncovering the associated mechanism by performing RNA-sequencing and mass spectrometry-based assessment of changes in gene expression and protein phosphorylation downstream of various small molecule agonists of the relaxin receptor. We expect to identify candidate pathways associated with a non-canonical vascular calcification inhibition by integrating the proteomic and transcriptomic data.

Florida International University

Antimicrobial activity of Marine Bacteria isolated from Gulf Toad Fish: Opsanus beta

Pragati Adesh & Jose Masso Maldonado

Dr. Michael J. Shamblott

The continuous evolution of bacteria drives the ongoing search for new antibiotics to fight common human pathogens. To defend against ecological pressures, marine organisms are known to produce antimicrobial compounds which can target both human and fish pathogens. The objective of this project is to evaluate the antimicrobial effects of bacteria isolated from the epithelial mucus of Opsanus beta. Preliminary assays identified a bacterium as exhibiting significant antimicrobial activity against Mycobacterium smegmatis and Staphylococcus aureus, with moderate activity against Bacillus cereus and Escherichia coli. Bacterial growth media was subjected to liquid-liquid extraction, where antimicrobial activity was observed in the organic layer. The crude extract was further separated using High-Performance Liquid Chromatography (HPLC), and four of the 17 fractions demonstrated bioactivity. Once

sufficient mass is collected for each of the four fractions, Nuclear Magnetic Resonance (NMR) spectroscopy will be conducted to determine the chemical structure of the active compound(s). Once compounds are identified they will be tested in vivo to assess their safety and potential for pharmaceutical applications against Mycobacterium, the causative agent of tuberculosis, and other common pathogens.

University of South Florida

Revealing the role of glia in the evolution of behaviors in Astyanax mexicanus

Pranav Jambulingam

Dr. Erik Duboue

Long thought to be simply a support cell for the brain, the glia now have a known role in modulating neural function and behaviors. Active research is being done in diverse model systems to understand the role of glia in neural function, yet how changes to glia lead to evolutionarily adaptive behaviors is an unexplored problem. The model system, Astyanax mexicanus, is a unique system among vertebrate models in that the fish exists as a single species with two evolutionarily divergent forms: eyed surface-dwelling fish and multiple populations of eyeless cave-restricted forms. This project will use the power of Astyanax, including many reagents developed by the Duboue lab, to understand how glia differ in these two evolutionarily divergent forms and how changes to glia diversity or function led to adaptive behaviors. Utilizing in situ hybridization with transgenic fish, we implemented different glial subsets into the Astyanax larval brain atlas. We expect these studies to set the stage for understanding what role changes in glia have in the diversity of life throughout the Animal Kingdom.

Florida Atlantic University

Investigation of Selective Cyclic Peptide Inhibitors Against Mesotrypsin as a Therapy for Tumor Metastasis

Preston Ackerman

Evette Radisky

Mesotrypsin is a serine protease that is one of the three digestive trypsins secreted by the pancreas in humans. Mesotrypsin is of extended interest due to the role it plays in cancer progression, where its upregulation in human cancer cells promotes tumor metastasis and is associated with poor outcomes. Developing selective inhibitors of mesotrypsin could offer new drugs for slowing metastasis. In this project, we are collaborating with the group of Dr. Alessandro Angelini of Ca' Foscari University of Venice to evaluate two cyclic peptides that were identified from a yeast surface display peptide library screen as potential high affinity, selective mesotrypsin binders. We are employing enzyme kinetics with purified recombinant proteins to test the peptides YM2 and YM3 against mesotrypsin to determine inhibition potency. The ongoing IC50 studies have indicated that both YM2 and YM3 are able to inhibit mesotrypsin with nanomolar affinity. By conducting IC50 studies versus other trypsins and a variety of other serine proteases, we will assess the peptides' specificities. Additionally, competitive inhibition studies varying both inhibitor and substrate concentration will be used to define the kinetic mechanism of inhibition. Co-crystallization studies are underway to generate crystals with both peptides bound to mesotrypsin for x-ray diffraction experiments to gain greater insight into the structural mechanism of inhibition. Thus far, both peptides have generated promising crystals in multiple buffers. The next steps for our project will be to send the crystals for x-ray diffraction and use diffraction data sets to solve the crystal structures. An additional future goal will be to test the efficacy of these peptide inhibitors in cell-based invasion assays to see how effectively they can block tumor cell invasion. This work can help to develop new therapeutics for cancer by targeting mesotrypsin, an important enzyme in

University of North Florida

Evaluating Conservation Strategies for the Perdido Key Beach Mouse

Providence Pangira

Dr. Sarah Krejci

Habitat loss and degradation are significant threats to species worldwide, leading to many being listed as endangered or threatened. The Perdido Key Beach Mouse (Peromyscus polionotus trissyllepsis) is one such species requiring intensive recovery efforts by different conservation groups, including reintroduction programs following habitat destruction caused by hurricanes. This study evaluates the life spans and causes of death of Perdido Key Beach Mice in zoo populations from 2002 to 2023 to assess the impact of conservation strategies. Statistical tests were done on seven zoos and they revealed no significant differences in life spans between male and female mice. However, average life spans varied across locations and periods but the trends were identical, with founder introductions between 2003 and 2015

correlating to a limited genetic pool, suggesting a high likelihood of inbreeding. Major causes of death included kidney, cardiovascular, and cancer-related diseases, indicating potential dietary or environmental factors affecting health outcomes. Conservation efforts for zoo populations need continuous monitoring and evaluation to mitigate risks associated with limited genetic diversity and environmental factors. Future recommendations include refining dietary protocols and expanding genetic variability through strategic population management. More rigorous genetic tests also need to be done to introduce a wider genetic pool in the safe populations in zoos. This work establishes the importance of data-driven approaches to improving recovery outcomes for endangered species like the Perdido Key Beach Mouse.

Bethune-Cookman University

Narratives of Choice: The Role of Media Framing in Shaping Abortion Perspectives

Quenae DeSue

Mr. Ray Caputo

Abortion is a heavily debated topic that has dominated the American news cycle for the past half-century. On one side, there are pro-choice believers who feel the right to abort a pregnancy should be the choice of the mother. On the other are pro-life activists who are against medical procedures that terminate pregnancies. Mass media is typically where arguments about abortion play out, with news organizations often framing these discussions in incomplete ways, which distorts public understanding. The result is further polarization between the two sides, and little focus on finding more humane solutions to a very complicated issue. The purpose of this research is to gain a better understanding of the role mass media plays in shaping public perceptions of abortion in both public and political arenas. This study uses a quantitative survey and agenda-setting framework to examine respondents' media consumption and how it relates to their opinions about abortion. Preliminary findings show that mass media choices appear to have a strong relationship with the opinions respondants have towards abortion. These findings suggest that having a diversity of media opinions when discussing complex social issues like abortion can help those on both sides of an issue come to a better understanding and perhaps even find a future solution to this age-old problem.

Bethune-Cookman University

An Automated Approach to Medication Management in Parkinson's Disease

Quinn Yuan

Dr. Joshua Wong

Parkinson's disease (PD) is a common neurodegenerative disorder characterized by motor symptoms like tremor, rigidity, and bradykinesia. Levodopa is the first-line treatment for motor symptoms in PD, but its dosage management can be challenging. Neurologists must frequently adjust the Levodopa Equivalent Daily Dose (LEDD) to balance benefits and side effects as the disease progresses, requiring personalized adjustments to adapt to the patient's evolving condition. We sought to develop an AI algorithm to automate this process while considering patient-specific disease characteristics. Using data from the Parkinson's Progression Markers Initiative (PPMI), we conducted a retrospective study using 731 patients' data, incorporating variables such as time since diagnosis, weight, gender, motor subtype, age, and Movement Disorders Society Unified Parkinson's Disease Rating Scale (MDS-UPDRS) scores. We implemented a Random Forest regression algorithm for its robustness with heterogeneous datasets and minimal need for data preprocessing. The model's performance was validated using a five-fold cross-validation technique and evaluated on a separate hold-out dataset to ensure generalizability. The model achieved a Root Mean Square Error value of 273.39, a R^2 value of 0.54, and a Pearson correlation coefficient of 0.74, indicating high accuracy in predicting LEDD. Feature importance analysis revealed that months since diagnosis, weight, and UPDRS scores played a significant role in model performance. Our findings demonstrate that machine learning can effectively predict personalized LEDD for PD patients throughout the course of their disease. The implementation of this model demonstrates a foundation towards personalized medicine in PD care.

University of Florida

Probiotic Modulation of Inflammation in Multiple Sclerosis: A Study on Lactobacillus paracasei Stimulating Myelin Regeneration

Rachel Abramovici & Laman Aliyeva

Nicole Verity, M.S.

Multiple Sclerosis (MS) is a chronic autoimmune disease that targets the Central Nervous system (CNS), this breaks down the myelin sheath into Myelin Base Protein (MBP) and results in neuronal inflammation. This inflammation impairs the

functionality of signals from the CNS to the different body systems.

Lactobacillus is a gram-positive bacteria commonly found in the human body, specifically the oral cavity, gastrointestinal (GI) tract, and female genital tract. They are widely used as probiotics and are believed to reduce inflammation, boost immunity, and restore a healthy gut microbiome. Lactobacillus paracasei is a component of the physiological flora that was proven to reduce neuroinflammation by releasing anti-inflammatory cytokines: IL-10 and TGF-ß, that inhibit T helper cells Th1 and Th17. Th1 and Th17 are pro-inflammatory factors that activate macrophages and cytotoxic T cells (CTLs), which release cytokines that target the myelin sheath as an antigen and thus, lead to its breakdown. This study aims to explore probiotics as a possible therapeutic approach for myelin regeneration in MS.

Our hypothesis suggests that exposing the MS cells to anti-inflammatory cytokines IL-10 and TGF-ß produced by Lactobacillus paracasei will reduce neuroinflammation by inhibiting Th1 and Th17 and this will cause myelin regeneration. Using tissue culture, we will introduce various cytokine concentrations to the in vitro model of MS over several periods of time. We will monitor the inflammation levels using the Cytokine Release Assay (CRA) and the concentration of MBP using ELISA. Regeneration of MBP will be monitored through Myelin Regulatory Factor (MYRF) gene activity.

University of Central Florida

Role of Dopaminergic Neuronal Projections from the Medial Orbitofrontal Cortex to Nucleus Accumbens Core Pathway in Cognitive Flexibility and Impulsivity

Rachel Evans

Nikhil Urs

The medial orbitofrontal cortex (mOFC) is a subsection of the orbitofrontal cortex, located in the prefrontal cortex. The mOFC plays a role in goal-based decision making, specifically in creating reward valuations and regulating effect allocation based on these valuations. Many such reward-based mechanisms are regulated by dopamine, both in the mOFC and in other connecting brain regions. Dopamine is a metabotropic neuromodulator with two main receptor types, D1 being excitatory and D2 being inhibitory. Based on our current understanding of these brain regions, our research goal was to determine the effect of mOFC to nucleus accumbens core (NAcc) D1 and D2 pathways on cognitive flexibility and impulsivity. Our methods coupled fiber photometry with behavioral tests, allowing us to visualize dopamine dynamics in tandem with performance in reward-based probabilistic reversal learning tasks. Our results did not find a significant number of successful reversals across groups, nor did we see any significant difference in inactive pokes across groups, indicating no significant differences in cognitive flexibility or impulsivity. Since prior research has shown the mOFC plays a role in probabilistic reversal learning and the NAcc plays a role in motivational behavior, it is possible some compensatory mechanism in the brain was the reason we did not see the expected results. In future research we plan to measure dopamine dynamics directly in the NAcc to gain a better understanding of the role of this specific pathway.

University of Florida

Relevantly Defining an Objective Reality Through Core Theories of Modern Physics

Rachel Tuyet-Nhi Nguyen

Dr. Wendy Chase

The nature of reality is a puzzle that physicists and philosophers alike have debated since as early as Aristotle. At this time, the closest we have to an answer could be found through quantum mechanics. However, this path is still extremely convoluted as experts cannot come to a consensus on how we should even interpret the implications the studies in this field suggest. My research is focused on relevantly defining our most objective reality. This was done by evaluating and comparing the top most discussed physics theories to determine which holds the most potential contributions concerning the practical and theoretical applications while still experimentally proving valid.

I have found that, currently, our most objective universe can be described with at least, and most, four definite dimensions, three spatial, and one time that can be warped. According to these restraints, the foundations of quantum mechanics in terms of particle duality and theories such as Einstein's Relativity and the Standard Model also appear as the most relevant and valid. With this, I've created a short story book with hand-painted illustrations titled Quantum Reality: An Adventure Through the Universe to simply describe some of my findings. My research works to call attention to some of the pointless, though still interesting, debates among physicists which cause them to make excess assumptions, and the storybook is to show how complicated topics can be condensed and

explained in simple terms with the hopes of igniting more people's interests towards physics.

Florida SouthWestern State College

The Apocalypse of Zephaniah in Light of the Apocalyptic Genre

Rachel Warren

Dr. Robert Kawashima

Despite lack of attention from scholars, the Apocalypse of Zephaniah is an important early example of an otherworldly journey within the apocalyptic genre, with compelling representations of justice, righteousness, and divinity. The apocalyptic genre concerns revelation that is "mediated by an otherworldly being to a human recipient, disclosing a transcendent reality which is both temporal, insofar as it envisages eschatological salvation, and spatial insofar as it involves another supernatural world" (Semeia 14). As a first century CE apocalypse detailing the journey of a righteous dead soul through otherworldly judgment, the Apocalypse of Zephaniah is likely an early and influential work in Jewish apocalyptic literature. With angels recording every merit and every evil of each human soul, creative and specific punishments for different sins, and a fearful yet righteous narrator, the Apocalypse of Zephaniah provides a vivid example of the otherworldly journey narrative. However, scholarship on this apocalypse is limited due to its fragmentary nature, with many scholars focusing on the origin of its manuscripts and relation to Christian apocalypses rather than interpreting its literary merit. This project seeks to situate the Apocalypse of Zephaniah within its literary and historical context, compare it to contemporary Jewish and Christian apocalypses, and appreciate its rightful place in the canon of apocalyptic literature.

University of Florida

Cryptococcus neoformans is involved in diverse microbial interactions in pigeon excreta

Rafael Garcia

Luis R. Martinez, Ph.D., M.B.A.

Pigeon droppings are an ideal niche for polymicrobial interactions and harbor potential pathogens that can greatly affect human health, especially immunocompromised individuals. Cryptococcus neoformans causes 152,000 new cases of meningoencephalitis in people with HIV/AIDS globally, resulting in an estimated 112,000 deaths annually. This encapsulated fungus can be found interacting with environmental microbes in soil contaminated with pigeon excrement and this medium has been suggested to play a central role in transmission from the environment to humans. C. neoformans survival within polymicrobial and other challenging communities has been shown to affect the evolution of its virulence factors. Using next generation sequencing, we collected pigeon excreta and assessed the relative abundance of bacteria and fungi in this natural reservoir, especially those of clinical relevance. We used bioinformatics tools to identify microbial diversity, interactions, network or clusters, and metabolic pathways in pigeon droppings that may drive the evolution of C. neoformans virulence contributing to its disease-causing ability in the human host. Elucidating the impact of polymicrobial interactions particularly those involving C. neoformans and its natural reservoir may help us to understand fungal virulence and pathogenesis, which may result in the development of novel treatments and therapeutics to manage cryptococcosis in patients with defective immunity.

University of Florida

Utilizing Neural Networks to Predict Italian Roe Deer Movements Overtime

Raul Castillo

Dr. Ellen Yi-Luen Do

Understanding animal movement patterns is essential for studying environmental phenomena and optimizing conservation efforts. Leveraging the Roe Deer from the EuroDeer: Roe deer in Italy 2005-2008 dataset, we developed two neural network models to predict the positions of an Italian Roe Deer overtime: a future prediction model that uses a future month, day, and temperature to predict a position into the future, and a past prediction model that uses past features to predict positions into the past. Our main goal was to assess how accurately these models can predict deer positions within a range of 3.005883 km, a value based on the maximum distance the deer traveled from their average position. After analyzing the dataset, we found that temperature had the strongest correlation with the deer's latitude and longitude (-0.311766 and 0.257934, respectively), justifying its inclusion alongside temporal values. We cleaned the data and divided it into training, validation, and testing sets for our models. Across 50 separate training sessions to test model consistency, the future prediction model accurately predicted 82%-99% of positions within range and 59%-85% within half of the range, and the past prediction model made 77%-85% of predictions within the range and 77%-78% within half of it. There

is a need to improve the accuracy of predictions and the precision of the future model's results, but the current results demonstrate the potential of neural networks for predicting wildlife movements. Future studies could explore additional models and datasets that include additional environmental factors to further improve prediction accuracy.

University of South Florida

Computational Analysis of the Interactions of 3-Aminopropyltrimethoxysilane and 3-(2-Aminoethyl)-3-Aminopropyltrimethoxysilane with Trimethoprim to Develop MIPs to Mitigate Antibiotic Pollution in Water Bodies

Raul Rivero

Gisselle Dominguez

Antibiotics have been used for several decades and have constituted a crucial development in the medical field to fight diseases. Despite their benefits, the widespread use and production of antibiotics have caused environmental pollution. This pollution, prevalent on a global level, has led to the development of various methods to eliminate antibiotics from natural environments due to their negative effects. This study examines how the monomers 3-(2-Aminoethyl)-3-Aminopropyltrimethoxysilane and 3-Aminopropyltrimethoxysilane interact with the antibiotic Trimethoprim (TMP) to form a noncovalent pre-polymerization complex. Pre-polymerization complexes are a critical aspect of the design of Molecularly Imprinted Polymers (MIPs), which are promising candidates for the separation of antibiotic residue from biological and environmental samples. To contribute to the development of MIPs, we utilized The Spartan'24 software developed by Wavefunction to analyze the functional monomers and proportions necessary to optimally bind with TMP. The most stable geometries (optimized geometries), intermolecular hydrogen bonds, binding energies, solvation energies, highest occupied molecular orbital–lowest, unoccupied molecular orbital (HOMO–LUMO) energies, and HOMO-LUMO energy gap were calculated by the computational method Density Functional Theory (DFT) (B3LYP/6-31G*). The stability of complexes at different stoichiometric ratios, the nature of interactions involved in the complex formation, and the optimal solvent environment of various ratio complexes were investigated and determined utilizing the same method. This computational study established the ideal conditions needed to obtain an efficient molecular imprinted polymer using 3-Aminopropyltrimethoxysilane and 3-(2-Aminoethyl)-3-Aminopropyltrimethoxysilane as the central monomers for the removal of the antibiotic trimethoprim from contaminated waters.

Miami Dade College

Finding Lost Archaeological Sites with AI

Raul Rojas & Olivia Zhang

Dr. Nicolas Gauthier

Archaeological sites provide a unique look at how communities from thousands of years ago lived and altered their natural environments, but we do not know the locations of many of these sites or whether they have since been destroyed. Object detection, a type of artificial intelligence, can process hundreds of images of Earth's landscape—finding underlying patterns in vegetation, elevation, and other qualities of the physical landscape—to identify archaeological sites. Here, we train an open-source object detection model to identify key archaeological features like shell mounds and ancient agricultural fields. With separate models trained on different datasets (satellite images, lidar-derived digital elevation models, and other remote sensing data), we found that the object detection model performed especially well with lidar-derived elevation data, helping differentiate raised archaeological sites from the surrounding landscape. The model is able to detect archaeological sites of different shapes and sizes. This research helps us understand how artificial intelligence can be applied to identify archaeological sites to document and preserve the imprints of these ancient communities.

University of Florida

Clue'd in I: Perceptions of Misdiagnosed Clients using Game-Based Pedagogy

Rebecca Harper & Isabel Fonseca

Patrick Smith

Although many psychology undergraduates gravitate towards clinically-oriented coursework, such courses tend to emphasize mental health diagnoses without ethical ramifications of misdiagnoses (Curtis & Kelley, 2023; Rössler, 2016). The current study modified the popular Clue board game into a version that focused on critical assessment of previously published case study diagnoses (Barnhill, 2013). Since board games have become valuable to engage students in critical thinking (Willet et al., 2018), it was hypothesized that game play as "clinicians" who are penalized for prematurely incorrect diagnoses would elicit

stronger perceptions of ethics in clinical case work. 42 first-year psychology majors completed an attitudinal survey which assessed perceptions of misdiagnoses in clinical practice. Participants were randomly assigned to one of two board game groups that varied by the presence/absence of ethical violation cards when they made incorrect judgements in the game. Participants took five turns where they received symptoms from previously published case studies (Barnhill, 2013), and they were able to make a guessed diagnosis after each turn. Incorrect guesses resulted in point deductions along with violation cards (in one group). Participants played four weekly rounds of the game, after which they received the same assessment as the pretest (short-term posttest) and again two weeks later (long-term posttest). Results revealed that participant attitudes for the prevalence of misdiagnoses significantly increased ($ps < 0.01$), while those who received ethical violations cards reported lower receptiveness for diagnoses made by untrained professionals. These data suggest a promising new strategy for introducing ethical awareness within clinical psychology.

Florida Southern College

Twahamwe: Reconceptualizing Gikuyu Agency in the Creation of Forest Scouting in Kenya

Rebekkah Hudson

Dr. Philip Janzen

Originally created by General Sir Robert Baden-Powell in England in 1908, Boy Scouting in Africa was introduced with the intention of convincing native populations to support the colonial regime, however, Baden-Powell's original err on the side of ambiguity exposed vulnerabilities that allowed local actors to appropriate this program and its connection to institutions of authority and respectability. One such case is that of "Men of the Trees," or a group of Gikuyu boys and men in Kenya operating as Forest Scouts and Scoutmasters under the Boy Scout principle of doing one good deed a day. Through a comparative analysis between monographs and oral interviews offered by Gikuyu elders and colonial ethnographic observations in travelogues, photographs, and newspapers, my research seeks to reinterpret how indigenous knowledge allowed these Gikuyu people to adapt to their material reality during the colonial era, thereby placing the history of African Forest Scouting into a larger historical narrative grounded in Africa. Upon conducting this research, I found that the Men of the Trees was not merely a colonial invention, but a product born from the interaction between Gikuyu agency and colonial ideas. This project contributes to a broader reconstruction of the history of British colonial development, showing that Gikuyu agency and indigenous knowledge contributed to the constraints of colonial policy in the region. The implications of these findings could add to modern understandings of the origins of international conservation organizations, as the Men of the Trees is now formally known as the International Tree Foundation.

University of Florida

Impact of Prescription Stimulant Misuse on Cognitive Function and Academic Performance Among College Students

Renee B. Korkoske

Kimberly A. Badanich

Prescription stimulant misuse is a growing concern among college settings, as its prevalence is increasing due to common misconceptions regarding the substance. This proposed study has 2 aims: 1) to identify the relationship between stimulant misuse and self-reported cognitive difficulties and academic performance indicators and 2) to determine if perceived academic benefits of prescription stimulants are related to changes in academic performance. Using a correlational study design and questions adapted from validated surveys, these data will gather information anonymously regarding academic metrics, prescription stimulant misuse and perceptions, ADHD-related symptoms, and mental health indicators. The findings and conclusions of this study are expected to provide valuable insights into the effects of prescription stimulant misuse on college students, help improve campus health and drug misuse prevention resources, support the development of evidence-based policies and community-engaged research, and challenge the common misconceptions surrounding prescription stimulant misuse by emphasizing and highlighting the consequences.

University of South Florida

Implications of Ozempic: A Semaglutide with Peptide (GLP)-1 Receptor Agonists Misused for Cosmetic Weight Loss

Renee Reardon

Amy Bohan

Ozempic, classified as a GLP-1 receptor agonist, is a semaglutide primarily prescribed for managing

type 2 diabetes. It operates by mimicking the hormone glucagon-like peptide-1 (GLP-1), thereby prompting insulin secretion and reducing glucagon levels. Administered via weekly injections, it aids in regulating blood sugar levels by enhancing insulin production from the pancreas. Originally designed to assist diabetics in controlling their blood sugar, it was later discovered to be effective in promoting weight loss as well. However, individuals using Ozempic for weight loss may face elevated risks of experiencing gastrointestinal issues. This conclusion stems from comprehensive research analyzing insurance claims spanning from 2006 to 2020, involving over 5,000 patients across the United States. The findings highlighted a range of health complications, including biliary disease, gastroparesis, pancreatitis, and bowel obstructions among those using Ozempic for weight loss. Notably, a 2023 Tebra Survey revealed a significant demand for Ozempic for weight loss, with 22% of Americans seeking prescriptions from their physicians and 15% having personally used it for weight management. Additionally, 47% of respondents reported knowing someone who had used Ozempic for similar purposes. These statistics underscore the imperative for healthcare providers to educate patients regarding appropriate medication use and associated risks. Moreover, the study underscores the necessity for further research initiatives and public awareness campaigns to address the hazards associated with the misuse of pharmaceuticals for off-label purposes for cosmetic usage.

University of South Florida

Evolution of Sequencing Technologies and Implications for Transposon Research

Renita Varghese & Jasneen Meghadri

Dr. Navi Gill Dhillon

This study explores the complex field of transposable elements (TEs) and how Next Generation Sequencing (NGS) technologies are used to identify them, including their limitations.

Transposons, also known as transposable elements, are dynamic DNA segments that have the ability to shift locations within a genome, impacting gene regulation, evolutionary processes, and genomic stability. TEs play vital roles in genetic research. They provide pathways for precise genetic alterations and mutagenesis, which facilitate the investigation of gene function and disease mechanisms in many organisms. Rapid DNA and RNA sequencing capabilities provided by NGS technologies have transformed genetic research. Improvements in DNA sequencing techniques have greatly improved our knowledge of diseases and potential treatments by generating a plethora of sequence information at a relatively low cost. This has also significantly improved the identification and analysis of TEs, even from short-read NGS technologies, resulting in better understanding of the function and implications of TEs in the genome. However, certain limitations exist in TE research. TEs belonging to a given family share high sequence similarity to each other. This along with the fact that TEs are present in multiple copies in the genome, makes their identification and annotation challenging. With advances in NGS long-read technologies, we can better address these issues by effectively standardizing processes for TE identification and annotation. In this study, we compare the advancements in NGS methods and their implications on TE research, with an objective to facilitate efficient identification and characterization of TEs to fully understand their applications in genetic research.

Nova Southeastern University

The Paradox of Pride: Exploring the Suppression of Intellectual Humility in Honor Cultures

Ria Shah

Dr. Irmak Olcaysoy Okten

Intellectual humility (IH), the recognition of the limits of one's knowledge, is a critical factor in promoting open-mindedness and productive discourse. Despite its importance, little is known about how emotional states influence IH, especially in cultural contexts where honor and reputation are central values. This research aims to address gaps in understanding the antecedents of IH, particularly how cultural values like honor moderate responses to criticism or perceived failure. Participants from diverse cultural backgrounds will complete an online survey with demographic data, and baseline IH and insecurity scales. This is followed by an in-person session where participants were randomly assigned to either an insecurity manipulation group, where they reflected on moments of personal failure or judgment in their family, or a control group, where they recalled neutral experiences in their family. IH levels were measured before and after the manipulation, alongside assessments of insecurity. Participants also complete a writing task reflecting on a disagreement or irritation with a friend, offering an alternative measure of IH. Preliminary results suggest that individuals from honor cultures exhibit greater declines in IH following the insecurity manipulation compared to those from non-honor cultures, with insecurity

mediating this effect. These findings highlight the dynamic interplay between emotional vulnerability and cultural values in shaping intellectual openness. This research contributes to understanding how cultural and emotional factors impact dialogue on sensitive topics, with implications for improving cross-cultural communication and conflict resolution strategies. Future studies could explore interventions to buffer the effects of insecurity on IH in honor-based societies.

Florida State University

Quantifying Host and Viral PROTEIN REMODELING during HIV REACTIVATION from Latency

Ricardo Roure

Dr. Mehdi Bouhaddou

After infection of human cells, the human immunodeficiency virus 1 (HIV-1) integrates itself into the host genome and enters into a latent stage. Eradication of the host reservoir is a major challenge in the struggle to develop a cure for HIV-1. One approach is to use drugs to reactivate latent virus; once reactivated, HIV can be sensed and destroyed by the host immune system. During reactivation, HIV uses host cell machinery to produce its own viral proteins, needed for replication and transmission. The full extent of host proteins utilized by HIV, and their post-translational modifications, remain mysterious. Here, we use mass spectrometry proteomics and phosphoproteomics to measure changes in the host proteome during HIV reactivation using Phorbol-12-myristate-13-acetate (PMA) in JLat 10.6 cells, a T-cell line. Mass spectrometry uses the mass to charge ratio of ions to identify proteins, also measuring the abundance of proteins or phosphorylated peptides in each sample. Here, we seek to quantitatively compare the host proteins affected during HIV reactivation, specifically identifying the biological pathways in which these proteins fall. We developed a complete quantitative analysis pipeline using the MSstats software package in R to assess quality control and perform quantitative statistical analyses between conditions (e.g. PMA vs Mock). Lastly, we performed gene set overrepresentation analysis to reveal the biological pathways regulated during HIV reactivation. Our results from the proteomics showed leukocyte activation is most regulated while the phosphoproteomics revealed the cell adhesion pathway was most significantly different, possibly due to cytoskeleton modifications during egress.

University of Florida

Spring-variable mass system: Study with Different Fluids

Ricardo Uzcategui & Paula Pazos

Adolfo Mendez

The present work describes the oscillations of an inexpensive and easily built-up physical oscillatory spring-mass system with mass varying in time. We used different fluids in this study, including both liquids and granular media: freshwater, acetone, clean and dirty sand, and a sugar-salt mixture. Instead of the most reported classical oscillating pendulum, this spring-mass system allows us to inquire about the deposition of mass and the effect of mass loss on the variables that describe the system's oscillations of a granular media. In this case (granular media), we studied avalanche occurrence during the deposition of the grains and the possible effect of downward-upward motion during the losing mass as the fluid column length varies with each oscillation. A description of the apparatus is given.

Miami Dade College

Investigation of a "Snake-Like" Eversion Locomotion Robot for Search & Rescue

Richard Chavez & Alexander Ouellette

Christopher Oshman

This project introduces an untethered, fluid-filled soft robotic snake designed to enhance search and rescue operations in disaster zones. Unlike traditional rigid robots, this innovative robot employs McKibben muscles, custom-developed at the University of North Florida, to generate controlled pressure gradients within a fluid-filled structure. This design allows for effective navigation and maneuverability through complex and confined terrains. The robot is equipped with a high-resolution camera, enabling real-time visual feedback to rescue teams and improving situational awareness during missions. The fluid-driven system's independence from external power sources facilitates rapid deployment and adaptability in unpredictable environments. By advancing soft robotic technologies, this project aims to improve accessibility and operational efficiency in search and rescue missions, addressing critical needs and potentially saving lives. This approach demonstrates the potential of soft robotics in disaster response by combining flexibility, mobility, and real-time monitoring capabilities.

University of North Florida

Mapping Palmetto Junction: Utilizing CAD and GIS Software for Archaeological Perspective and Methodology

Richard Shoemaker

Peter Sinelli

In collaboration with research gathered by Professor Peter Sinelli of the University of Central Florida, this project digitizes data previously found regarding location and shape of numerous middens and meaningful structures found on the Palmetto Junction site of Providenciales, Turks and Caicos Islands. This project includes taking data like GPS coordinates and hand drawn sketches of said middens and creating a working map that could be used in the future to visualize certain aspects of the site. Programs like AutoCAD and ArcGIS were used to digitize and create the shapefiles necessary to accurately define boundaries of the site's important features. The Palmetto Junction archaeological site in particular is meaningful towards better understanding the Lucayan Taino people of the Bahamian archipelago for its richness in artifact production and proximity to meaningful geographical areas. As research continues on this site, the hope is to gain greater foresight of the housing structures, social constructs, and belief system of the Taino tribes in this local area. With this project in particular, I aim to use this map in order to see if there is an accurate correlation to pre-conceived notions regarding cultural and geographic reasonings of midden placements. The hope is to also use the findings from this project to better understand settlement patterns and trade routes across the greater Caribbean island chains and native peoples.

University of Central Florida

My Body, Your Choice: How the overturn of Roe v. Wade is emblematic of the U.S. government's abusive treatment of women

Riley Alvero

Dr. Leanna Papp

Abusive relationships are most often studied at the interpersonal level within intimate partner relationships. However, many of the same dynamics underlying such intimate micro-level abuse, such as reproductive coercion, may appear in womens' macro-level relationships with institutional partners as well. The reversal of Roe v. Wade in June 2022 highlighted these dynamics in a particularly clear light: many women across the country expressed outrage over the decision and the ways in which it would control their minds and bodies. Given these parallels, this research asks to what extent might intimate partner control be extended to governmental restrictions on reproductive rights? This project will begin to answer this question using inductive and deductive qualitative approaches mapping key theoretical arguments at both the micro and macro levels. The effects of this historic nullification of individual rights will have real and poignant impacts on women as a collective group. This project aims to add to the literature surrounding feelings about reproductive health care and reproductive decision-making in the context of increasingly limited and stigmatized access to abortion care.

University of Central Florida

The Fungal Pharmacy: Techniques of Isolation of Novel Secondary Metabolites from Fungal Species

Riley Grace Bulnes

Bill Baker

Endophytic fungi produce secondary metabolites that are essential in protecting the fungi and its host from infections. This defense mechanism of the fungi can be harnessed for human use in a variety of ways. One focus being as a source of antimitotic to combat Candida albicans and Candida auris. TAP14-275 is an endophytic penicillium sample gathered from the mangroves of Tapachula, Mexico. The sample was treated with the epigenetic modifier Nicotinamide a Histone Deacetylase inhibitor which changes how the DNA is read therefore altering the secondary metabolites within the fungi. Changing the secondary metabolites can create new compounds active against C. auris, and C. albicans. This study aims to isolate these secondary metabolites using Chromatographic techniques then decipher these compounds using Mass Spectroscopy and 1D and 2D Nuclear Magnetic Resonance techniques.

University of South Florida

Contributions of ovarian hormones to executive functioning in aged female Fischer 344 X Brown Norway F1 hybrid rats

Rishi Karpur

Dr. Barry Setlow

Prefrontal cortex mediated executive functions typically change with age, and studies suggest that sex differences may be present due to altered gonadal hormone levels. Recent research evaluated male, female, young and aged hybrid FBN rats in executive functioning tasks and concluded that performance in aged females

was intact while male performance was severely impaired. Unlike humans, aged female FBN rats maintain estrous cyclicity into advanced ages. Therefore, we evaluated whether estrous cycling contributes to maintained performance in aged FBN female rats on intertemporal choice (IRT), working memory (WM), and probabilistic reversal tasks (PRT). Aged female rats underwent ovariectomy (OVX), or control (Sham) surgeries, followed by behavioral testing. In IRT, rats selected between a small, available food reward and a large, delayed food reward delivered after a variable delay (0-60s). OVX and Sham females did not exhibit behavioral differences, with both groups discounting the large, delayed reward to the same degree. In WM, rats had to recall the location of a lever following a variable delay (0-24s). Both OVX and Sham rats were impaired at longer delays, but both groups did not differ from each other. In PRT, which assesses cognitive flexibility, rats had to discriminate between two levers that were reinforced at different probabilities and were switched multiple times per session. Both groups completed the same number of reversals across test sessions. These data suggest that maintenance of ovarian hormones in aged female FBN rats does not account for their spared executive functions compared to aged male FBN rats.

University of Florida

Disparities in Maternal Healthcare: Examining the Impact of Social Determinants on Provider Care Quality

Rishita Anumukonda

Amy Donley

Over the past two decades, maternal mortality in the U.S. has risen greatly, reaching 32.9 deaths per 100,000 live births in 2021, compared to 17.4 in 2018. Racial disparities persist, with non-Hispanic Black women experiencing maternal mortality rates more than twice that of non-Hispanic white women. Social determinants of health (SDOH)– the non-medical factors that influence health outcomes–play a crucial role in these disparities. Unlike biological determinants, SDOH are shaped by societal structures and influence access to resources, opportunities, and quality healthcare. Patient-provider discussions are critical in maternal healthcare, where health needs are rapidly changing during pregnancy. However, variations in these discussions based on SDOH may result in inconsistent patient education, contributing to maternal health disparities. This study explores how the content of the healthcare provider discussions during prenatal and postpartum care varies with patients' SDOH, and how these variations impact maternal health outcomes, including patient adherence to care recommendations and trust in the healthcare system. A cross-sectional analysis is conducted using the Phase 8 Pregnancy Risk Assessment Monitoring System (PRAMS) from the Centers for Disease Control and Prevention. After analyzing the data using Python, linear regression models are created to determine any correlations between SDOH and the likelihood of providers discussing risk factors, preventative care, and available resources during prenatal and postpartum care. The effects on trust and adherence are also assessed. By identifying these correlations, future research can contribute to the goal of creating more equitable maternal healthcare practices.

University of Central Florida

Investigating the Interaction of Gram-Positive Lactobacillus Species with Mucin In the Context of Barrett's Esophagus.

Ritisha Suresh

Dr. Claudia D. Andl

Gastroesophageal Reflux Disease (GERD) is a disease that can progress to the precancerous Barrett's Esophagus (BE) condition in which normal squamous epithelium of the esophagus is replaced with columnar epithelium containing goblet cells resembling the intestine. Goblet cells secrete mucins, sticky substances that serve as a scaffold for the attachment and colonization by several microorganisms. Probiotic Lactobacillus bacteria process this mucin by breaking it down into its component sugars (glycans) using their glycosidase enzymes. This project aims to investigate and identify the role of the Lactobacillus-mucin interaction in the dysplastic BE condition – currently, the usage of these glycans is unclear and could confer an advantage to the lactobacillus bacteria itself or to other commensal microbiota. To investigate the hypothesis that Lactobacillus species' growth is enhanced in the presence of mucin, CFUs, growth curves, and biofilm assays were done in triplicate/quadruplicate, treating 3 strains of Lactobacillus (acidophilus, planterum, and fermentum) with 0.05% and 0.1% mucin. All 3 methodologies confirmed that all three lactobacillus strains had enhanced growth when supplemented with mucin and adhered to the mucin when present, with statistical significance ($p = 0.01$) for Lactobacillus acidophilus CFU/mLs. This project is ongoing, and the goal of identifying the role of the lactobacillus-mucin interaction will be investigated using CBP and BAR-T cell lines supplemented with mucin and/or lactobacillus

strains. Ultimately, glycans contribute to the assembly of the microbiota and host–microbe symbiosis. They can thus be used as innovative nutritional strategies or as synthetic prebiotic glycans aimed at improving mucosal health.

University of Central Florida

Socioeconomic Status as an Indicator of Perceptions about AI as a Healthcare Resource

Rosalie Holderith & Amrutha Venkat

Ashleigh Bennett

The popularity of Artificial intelligence (AI) has grown exponentially since its improvement and increased accessibility. Many have explored AI models for healthcare questions and decisions, specifically ChatGPT, due to its free and user-friendly interface. This study analyzed perceptions of using AI to make healthcare decisions across the socioeconomic strata. A total of 398 participants completed a nationwide online survey assessing perceptions of ChatGPT. Socioeconomic status was measured by education level and household annual income, ranging from high school to doctorate, and 0 to over 200,000, respectively. Questions included Likert scale rankings on statements related to trust and comfortability with ChatGPT. Quantitative statistical analysis was completed on the results, all with normal distribution. Results showed those with a higher SES have a greater level of trust in AI with their health decisions. 57% of high-income respondents (income of $175,000 and above) reported agreed or strongly agreed with the statement "I am comfortable with the idea of using ChatGPT as a resource to help me make decisions about my health.", while only 25% of low-income respondents (income below $24,999) reported the same. Inductive thematic analysis of low-income participants' survey responses revealed themes of mistrust in information, lack of personalized responses, and limited knowledge regarding ChatGPT. Results suggest income and education can be used as indicators of trust in ChatGPT as a tool for health decisions, and lower-income participants reported lower levels of trust. Despite increased use, AI has room for enhancement, especially in gaining trust of those across the socioeconomic strata.

Nova Southeastern University

RAISE (Reveal, Amplify, and Implement Strategies for equity) Qualitative Data Analysis and Next Steps

Rowan Taber-Richardson

Starlette Sinclair

RAISE (Reveal, Amplify, and Implement Strategies for Equity) is an NSF ADVANCE project to expand understanding of the confluent equity environment at Florida Gulf Coast University and Southwest Florida. This project aims to impact the environment by presenting data to stakeholders through quantitative and qualitative data based on multiple engaging discussions and presentations on the inequalities between the STEM department and women in the faculty. The RAISE team continues to speak to faculty and hold space for discussions and questions about the presented data. The RAISE team uses these events and interactive experiences to build a five-year equity plan to present to stakeholders. This study is looking specifically into one of these events, Day of Dialogue II, the second event of its kind, held for the FGCU community. The RAISE team looked at the previous DoD discussion, bringing to light data that the previous participants asked for and brought forward new data for participants to discuss. The RAISE team provides participants with data and discussion questions based on the inequalities and discrepancies in FGCU faculty and a moderator is at their tables to record responses. These responses are plugged into a qualitative data coding program MAXQDA. This study aims to present how DoD II engaged faculty in the RAISE project by presenting the qualitative data and how the team will then use this data in putting together future events and developing the five-year plan.

Florida Gulf Coast University

Stem Cell-Based Treatments for Spinal Cord Injuries

Roy Chen & Vaishnavi Kota

Dr. Olukemi Akintewe

Spinal cord injuries disrupt the human body's sensorimotor functions. However, with studies on regenerative medicine, stem cell treatments have been implemented in the central nervous system (CNS) to restore functions after spinal cord injuries (SCI). This systematic review aimed to assess the effectiveness of different stem cell therapies against SCI. By using "spinal cord injuries," "stem cell research," and their Medical Subject Headings

as its search terms, this review yielded 370 results from PubMed. Using Rayyan, this review included ten English, original, peer-reviewed studies between 2014 and 2024, while it excluded review articles or studies that do not focus on human adult stem cells and SCI. Through immunosuppressive drugs, phase I/II clinical trials confirmed stem cell therapy's safety. From there, stem cell therapy's effectiveness was assessed using the American Spinal Injury Association's Impairment Scale (AIS). Many types of stem cells showed promising results: adipose-derived stem cells grown alongside endothelial cells significantly enhanced neural growth with capillary recruitment. Additionally, nearly half of the patients receiving autologous bone marrow mesenchymal stem cells (MSC) had improved ASI grading, sensorimotor functions, and bladder usage. Nevertheless, some stem cells yielded conflicting results. Although CNS stem cells in the thoracic spinal cord improved senses, they did not affect the lower extremities' motor scores. Similarly, umbilical cord MSC significantly improved sensorimotor functions, but another study found the lower extremities' improved strength to be insignificant. Although stem cell therapy showed promising results for resolving SCI, more research is needed to improve stem cell therapy's effectiveness.

University of South Florida

Hydrophobicity and Water Absorptivity in Fused Filament Fabricated Ultem 9085

Ryan Spence & Carson Rogers

Dr. Jutima Simsiriwong

Radar systems are used extensively in the modern world for communication, weather forecasting, military operations, and more. The delicate and expensive parts of radar systems are typically protected with a plastic or composite covering that allows for uninterrupted transmission of radio frequency (RF) electromagnetic waves (EMW). While the currently understood mechanics of EMW transparency through solids are quite complicated, it is an accepted rule of thumb that polymers allow for RF transparency. Due to its polar nature, the buildup of water, often due to heavy rain, on polymer radome surfaces has a significant impact on the EMW transparency of the surface. Whether the buildup of water is due to absorption by the radome material or sheeting caused by low radome material hydrophobicity, a negative impact on signal transmission is observed. While commercially available radomes employ various coatings to mitigate water absorption and increase hydrophobicity, the production of radomes with material properties comparable to coated pieces could reduce costs, manufacturing footprint, and fabrication time. This project aims to measure both the water absorptivity and hydrophobicity properties of fused filament fabricated (FFF) Ultem 9085, which is printed using a Stratasys Fortus 450MC, for their use as radome coverings. Using the ASTM D570 standard, mass percent difference will be measured to estimate the water absorption value of an Ultem 9085 sample. To measure hydrophobicity, ASTM F22 will be utilized. In this procedure, a droplet of water is placed on a flat sample and the contact angle is measured, which determines the material's hydrophobicity.

University of North Florida

Investigating Resveratrol and its Mechanisms on Drug Resistant Breast Cancer

Ryan Stewart

Dr. Kimberly Dobrinski

Breast cancer will develop in about 1 in 8 women in their lifetime, and is responsible for more than 40,000 deaths per year. Currently, drug resistance is a major reason for poor prognosis which keeps mortality rates high each year. Resveratrol, a potential treatment option, is a natural occurring antioxidant found in the skin of grapes and various plants. In previous studies, resveratrol has shown promising anticarcinogenic effects in multiple cancers such as prostate, pancreatic, colorectal and others. Therefore, this study aims to investigate resveratrol's effects on both drug-resistant and drug-sensitive breast cancer using MDA-MB-231 and MCF-7 cells respectively. Preliminary research from this study has shown resveratrol to cause cell death in both MDA-MB-231 and MCF-7 cell lines. These results were produced via CyQUANT assay which measured cell viability at various resveratrol concentrations (100µM, 150µM, and 200 µM). As resveratrol concentration increased, a decrease in cell viability was observed indicating resveratrol's promising apoptotic effects. Previous results from this study demonstrate cells are not changing their metabolic growth strategy to oxidative growth. This was shown by no significance for oxygen plate and lipid peroxidase assays at various resveratrol concentrations (100µM, 150µM, and 200 µM). In an attempt to elucidate resveratrol's mechanism of induced apoptosis, this study will investigate the PI3K/Akt and NF-B pathways.

University of Tampa

Federal and State Legal Obstacles to Religious, Personal, and Medical Psychedelic Use

Ryder Rucco & Mason Marks

Dr. Mason Marks

Psychedelics, drugs that act as hallucinogens and alter consciousness, have recently exhibited physical and psychological benefits. Their consumption is longstanding within American religious and Indigenous communities. Federal and statewide bans prevent access to psychedelics that relieve illnesses and are crucial to archaic traditions. This project examines the prohibitory regulations and viewpoints that block vital psychedelic access. The researcher analyzed legal precedents involving religion, workplace rights, and drug usage, alongside the advent of psychedelics in healthcare, using sources including books, journals, and court cases to create a literature review. Many restrictions emerged in the postwar period when psychedelics were stigmatized. Fears of societal deterioration maintain these regulations despite the opinions of Supreme Court justices that decriminalization would equitize Indigenous communities without substantial public risk. Collective opinions amongst medical, legal, and traditional communities contrast regarding the legalization of psychedelics. Consistently, the Supreme Court defends religious freedom, yet the primary contention to legalization is that it could enable drug trafficking or promote delinquency. The Free Exercise Clause considers laws that apply to all groups impartial, creating a conflict between cultures that desire psychedelics and those who may be harmed. Psychedelics necessitate inquiry involving medicine and divinity to decide on uniform legalization when faced with potential dangers. Future research must examine how laws may protect personal well-being by permitting psychedelic consumption while ensuring societal cohesion. This will enable the United States legal system to encourage individual freedom, maintain the power balance between state and federal governments, and uphold Constitutional rights that protect American citizens.

Florida State University

Predicting a di-Higgs mass through the use of Neural Networks

Ryne Starnes

Dr. Harrison Prosper

The Higgs boson is a recently discovered particle (confirmed to exist in 2013!), implying the existence of a Higgs field. The Higgs field is essentially what grants mass to everything in our universe, with the amount of mass being determined by how much an elementary particle interacts with the field. Considering its relative infancy in the field of physics, there is still very much we do not know about the Higgs boson. Perhaps the most intriguing, however, is what would happen if two Higgs bosons were to interact with each other. This research intends to predict just that; more specifically, given a set of parameters, what would be the measured 'di-Higgs mass'. Through use of a neural network, we model 5 different couplings capable of producing two Higgs bosons at the same time. Given a dataset of these and the possible di-Higgs masses associated, we hope to train a neural network model to then give us a theoretical di-Higgs mass when we input values for these parameters. This would be relatively simple to test experimentally, except for the fact that the current Large Hadron Collider at CERN is currently unequipped for such an experiment, and needs until 2029 to complete the necessary upgrades. Until then, however, our model can be used to predict a possible di-Higgs mass and have a sizable impact on our current understanding of high energy physics' ever-elusive Standard Model.

Florida State University

Global Environmental Injustice and Respiratory Health: The Impact of Redlining, Pollution, and Alveolar Damage in Detroit, São Paulo, Johannesburg, and Delhi

Sammi Rather & Rylie Brooker

Mintoo Patel

Environmental injustice resulting from systemic discrimination, including redlining, has perpetuated health disparities globally. We investigated the impact of chronic exposure to air pollution on respiratory health in marginalized neighborhoods of Detroit (USA), São Paulo (Brazil), Johannesburg (South Africa), and Delhi (India), where socio-economic inequities exacerbate environmental vulnerabilities. A comprehensive review of scientific studies and environmental health literature formed the basis of our analysis, focusing on pollutants such as particulate matter (PM2.5), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2).

Findings indicate that prolonged exposure to these pollutants induces oxidative stress, inflammation, and immune dysregulation, leading to alveolar damage characterized by reduced size and impaired gas exchange. These structural changes contribute to a higher prevalence of respiratory diseases, including asthma, chronic obstructive pulmonary disease (COPD), and emphysema. For example, Delhi's severe air pollution has been

linked to a marked increase in asthma rates among children, while São Paulo's vehicular emissions correlate with elevated respiratory hospitalizations.

Health inequities are compounded by limited access to healthcare and inadequate urban planning in these regions. Our research underscores the intersection of environmental exposure, socio-economic inequality, and respiratory health, highlighting the urgent need for targeted interventions to reduce pollution and mitigate the biological impacts of environmental injustice globally.

South Florida State College

Glioblastoma Invasion Relies on Actomyosin Contractility and Metalloproteinase Activity

Shiv Patel, Vidhisha Gautam & Taylor Gogolen

Dr. Jerome Irianto

Glioblastoma multiforme (GBM) is one of the most aggressive and invasive types of brain tumors with a 5-year survival rate of less than 20%. Due to its highly invasive phenotype, GBM cells tend to invade the surrounding normal brain tissue, making it challenging to fully resect the tumor and resulting in a relapse of the disease even after surgery. Hence, it is crucial to improve our mechanistic understanding of GBM invasion phenotype, in the hope of inhibiting the disease progression. Here, we used patient-derived GBM neurospheres as a model to study GBM invasion. When these neurospheres were cultured in Matrigel, the GBM cells spontaneously invaded the surrounding microenvironment. We first characterized the invasion rate through live imaging and the forces exerted by cells as they invade the Matrigel using traction force microscopy (TFM) analysis. We observed a significant increase in cellular contractility as the cells invaded the surrounding Matrigel, prompting us to investigate the role of myosin in the cell invasion. To test this, the GBM neurospheres were treated with a myosin inhibitor, Blebbistatin. Myosin inhibition led to reduced GBM invasion and contractility. Furthermore, we investigated the role of metalloproteinases (MMPs) and showed that GBM invasion relies on MMP activity in the absence of myosin. Together, this data shows the interplay between myosin and MMPs in GBM invasion.

Florida State University

Poster Session V – Abstracts

Genetic Confirmation of Bacterial Isolates from Anolis sagrei and Agama picticauda

Izabela Kowalik & Melissa Alvarez Z'graggen

John Whitlock

The Brown anole (Anolis sagrei) is a species of lizard common in the Caribbean as well as Florida and other Southeastern United States. Agama picticauda, also known as Peter's rock agama, is a species native to West Africa but was introduced to Florida as part of the pet trade in the 1970's. A variety of bacterial symbionts would be expected in cloaca samples based on the ubiquity of intestinal bacteria such as fecal coliforms, as well as Salmonella, which are known to colonize the cloaca. The aim of this research is to collect and characterize cloaca samples to study the microbiome in these two species. Nineteen brown anoles and nineteen Agama lizards from the Tampa Bay area were collected and tested for culturable bacterial flora by swabbing the vent and streaking on XLD, MSA, or TSA media. Presumptive Salmonella and Staphylococcus from XLD and MSA respectively were tested with Polymerase Chain Reaction (PCR). Universal 16srRNA primers and novel Salmonella specific gyrA primers were utilized to amplify and sequence bacterial DNA for confirmation of species identity. Of the Gram-negative bacteria that were sulfur reducing, only Salmonella was amplified with the gyrA primers distinguishing them from Pseudocitrobacter and Citrobacter. Gram positive isolates from MSA were identified as Staphylococcus saprophyticus, as well as several Bacillus species. Further investigation will focus on the diversity of the microbiome and prevalence of potential pathogens in lizard populations based on a greater sample size, as well as genetic confirmation of the species and strain.

Hillsborough Community College

Influence of Corrosion Inhibitors on Post-Tensioned Steel Tendons: Mechanisms and Corrosion Monitoring

Sofia Paula Cherrez Reivan

Dr. Christopher L. Alexander

The durability of post-tensioned steel tendons in corrosive environments depends significantly on the effectiveness of corrosion inhibitors. This study evaluates the time-dependent performance of various inhibitors applied to steel strands, with a focus on their mechanisms of action and impact on corrosion rates. Electrochemical impedance spectroscopy (EIS) and open-circuit potential (OCP) are used to monitor corrosion behavior, while optical damage surveys (ODS) provide complementary visual assessments of corrosion damage over time.

Steel samples are treated with a range of corrosion inhibitors, including organic, inorganic, and hybrid formulations, and exposed to simulated corrosive environments. EIS measurements track changes in polarization resistance, capacitance, and charge transfer processes, offering insights into inhibitor film stability and electrochemical barrier properties. OCP data provide early indications of corrosion susceptibility, while ODS characterizes surface-level damage, enhancing the understanding of inhibitor performance.

Mechanistic analysis of the inhibitors explores their adsorption behavior, film-forming capabilities, and ion-blocking effects, linking chemical composition to observed protective performance. Results reveal distinct variations in inhibitor efficiency, with certain formulations demonstrating superior resistance to corrosion initiation and progression.

This study contributes to the development of advanced corrosion protection strategies, enhancing the longevity and safety of critical infrastructure

University of South Florida

Investigating the Effects of Simulated Microgravity on Yeast Growth and Pathogenicity in Candida parapsilosis and Rhodotorula mucilaginosa

Takara Keely Edamura O'Brien

Hugo Castillo

Candida parapsilosis and Rhodotorula mucilaginosa, yeast species found in the human gut microbiota, can transition into opportunistic pathogens, particularly in immunocompromised individuals. Microgravity conditions, such as those encountered during spaceflight, appear to exacerbate their pathogenicity, increasing antifungal resistance, including to drugs like Amphotericin B. Building on this knowledge, our

project investigates how simulated microgravity affects the growth and expression of genes related to virulence in these yeast species.

Using a Rotating Cell Culture System to simulate microgravity, we analyzed colony growth patterns and collected data on morphology, growth rates, and potential biofilm formation. Preliminary results indicate that yeast exposed to simulated microgravity exhibit nearly double the growth rates of those grown under normal gravity. While normal-gravity cultures followed a typical growth curve with a clear lag phase, microgravity cultures demonstrated a slower initial adaptation but ultimately surpassed normal-gravity growth. This rapid growth under microgravity suggests an adaptive advantage that could enhance pathogenicity.

To further investigate, we are employing real-time PCR to assess the expression of virulence-related genes, such as ERG2, ALS1, and HWP1, which are linked to antimicrobial resistance and biofilm formation. Understanding the differential gene expression under simulated microgravity is critical for identifying the molecular pathways driving increased pathogenic potential. These findings provide insights into the risks posed by gut microbiota adaptations during spaceflight, informing strategies to mitigate infections in astronauts and improve antifungal therapies both in space and on Earth.

Embry-Riddle Aeronautical University

Validating a Nonintuitive Electrostatic Prediction Through Analytical and Numerical Conformal Mapping

Thach Nguyen

Dr. Tatiana Eggers

In electrostatics, conductors often introduce complexities that make electric field and charge distributions challenging to predict. The Green's function for a given boundary setting, however, reveals that electric potential remains unchanged when a test charge and measuring point are swapped, allowing symmetrical and asymmetrical charge distributions to produce the same potential in a way that can be non-intuitive to early scholars. We examine this nuance in 2D by mapping conductors with shapes such as hexagons, pentagons, and rectangles to a circular configuration, achieving a symmetrical configuration. For these general shapes, we employ MATLAB's Schwarz-Christoffel Toolbox, while the analytically tractable elliptical case utilizes Joukowski mapping. Our results qualitatively and quantitatively confirm this intrigueing symmetry of Green's function, providing a visual and conceptual framework to enhance students' imagination of electrostatic equilibrium.

University of South Florida

Development of Sulfonyl-γ-AApeptide PROTACs for ß-catenin Degradation and Inhibition of Wnt Signaling in Colorectal Cancer

Ting Chao

Jianfeng Cai

Colorectal cancer (CRC) is the third most commonly diagnosed cancer, which despite recent advances in treatment, remains incurable due to molecular heterogeneity of tumor cells. Hyperactivation of Wnt/ß-catenin signaling has been associated with many types of tumor initiation and progression. Bcl9 oncogene functions as a transcriptional co-activator of the Wnt/ß-catenin pathway, which plays critical roles in colorectal cancer pathogenesis. In this study, by mimicking the α-helical HD2 domain of BCL9, we developed sulfonyl-γ-AApeptide as an alternative strategy of canonical peptide-based inhibitors to the Wnt/ß-catenin signaling pathway using solid phase peptide synthesis. Our previous results showed that these helical mimetics can structurally and functionally mimic the BCL9 helix and disrupt ß-catenin/BCL9 interaction in cells with excellent potency and specificity. Moreover, enzymatic stability studies demonstrate the remarkable stability of the helical sulfonyl-γ-AApeptides, augmenting their biological potential. We then designed PROTACs (proteolysis targeting chimeras) by coupling Bcl9 mimic helix with E3 ligand, using PEG Azide linkers. It is hypothesized that Sulfonyl-γ-AApeptide PROTACs can achieve efficient ß-catenin degradation and inhibit Wnt signaling, thus highlighting the potential of ß-catenin degrader PROTACs as promising anticancer therapy.

University of South Florida

Identifying Orally Bioavailable Compounds Effective at Inhibiting HIV Proliferation

Vishwa Murugappan

Alexander Mettler

Human Immunodeficiency Virus (HIV) treatment requires new, orally bioavailable drug compounds that can effectively inhibit viral proliferation. This study investigated potential compounds targeting three key HIV-related proteins: HIV Protease, CCR5, and Histone acetyltransferase KAT5.

The research applied computational methods to systematically screen potential drug compounds using Lipinski's Rule of Five, a set of chemical and physical standards for predicting oral bioavailability. The primary goal was to efficiently narrow down thousands of compounds to a select few with high treatment potential.

The researcher used the ChemBL Python library to gather compound information, initially screening over 3,000 compounds based on their Half Maximal Inhibitory Concentration (IC50) values. The RDKit Python library was then used to analyze biologically active compounds for compliance with Lipinski's rules, examining critical factors like molar mass, lipophilicity, and hydrogen bond characteristics.

The study successfully identified biologically active compounds that meet Lipinski's Rules for each target protein. The top five compounds for each protein were ranked based on bioactivity and oral bioavailability potential.

This computational approach offers a streamlined method for identifying promising HIV treatment compounds, potentially accelerating drug discovery and leading to more effective, orally administered medications with fewer side effects.

Limitations include reliance on databases and cheminformatics libraries. Future research could incorporate additional computational tools for more comprehensive analysis of oral bioavailability indicators.

University of South Florida

Comprehensive Review of Current Literature Surrounding Potential Treatment and Prevention Options for John Cunningham (JC) Virus and Progressive Multifocal Leukoencephalopathy (PML)

Zachary Nesta & Anna Barnes

Dr. Olukemi Akintewe

Human polyomavirus 2, alternatively referred to as John Cunningham (JC) virus, lies dormant in more than half of the adult human population. It does not cause problems for the majority, but may develop into a serious brain infection called progressive multifocal leukoencephalopathy (PML) in those who have weakened immune systems due to various corticosteroid or immunosuppressive therapies. Individuals with autoimmune conditions are also at risk for PML; in fact, PML is most common among those with an HIV-1 infection. PML targets the myelin of white brain matter and is characterized by dementia, poor coordination, progressive weakness, aphasia, and vision issues depending on what area of the brain is affected. The progression of such deficits leads to disability and, frequently, death. PML is currently irreversible, however various options may extend survival and stall progression. In this literature review, a software—Rayyan—was used to analyze 2,323 PubMed articles published between 2010-2024 focused on JC virus and PML treatment and prevention options. Current treatments focus on immune reconstitution, antiretroviral therapy (ART), and novel strategies such as antimalarial medications, T-cell adoptive transfer therapies, or immune checkpoint inhibitors. The outlook for individuals with PML heavily depends on the treatment received. In general, PML has a mortality rate of 30 to 50 percent in the first few months following diagnosis. The aim of this review is to provide a comprehensive base of knowledge that may be used to better the quality of life of people at risk of or those with PML.

University of South Florida

Tikkun Olam: The Role of Judaism in Achieving Women's Suffrage in the United States

Megan Meese

Dr. Anna Peterson

The late 19th and early 20th centuries saw the revitalization of the women's suffrage movement in the United States (U.S.), and rising antisemitism in Eastern Europe during the same period prompted a rapid increase in the U.S. Jewish population. The simultaneity of these historic events naturally proposes an inquiry into the role of Judaism and the growing Jewish community in the U.S. women's suffrage movement. Jewish teachings about the equality and dignity of humankind positioned the Jewish community to support women's suffrage. Traditions of Tzedek (pursuing justice) and Tikkun Olam (repairing the world) were central to the practical religion of American Jews and motivated them to pursue active roles in orchestrating this social change. Furthermore, Jewish lived religion and experiences with antisemitism evoked an empathy that inspired many Jewish individuals and communities to combat discrimination and inequality against other marginalized groups, such as by participating in the women's suffrage movement. Contemporary American Jewry continues to uphold these traditions of activism as pursuing social change is part of performing mitzvot (commandments and good deeds) in Judaism. Thus, religion can inspire social change by empowering individuals to work towards a better world.

University of Florida

Motivation for Social Media and Social Media Disorder

Miranda Kraenzlin

Dr. Karen Mottarella

Social media usage is stronger than ever and reasons for use include casual engagement, self-expression, and access to information. This study examines the relationship between motivation for engagement with social media and disordered use of social media. Social media use can have negative effects on mental health, and at its most severe, can result in disordered usage and even behavioral addiction in which an individual engages in problematic and uncontrollable use. The present study investigates motivations for social media use in relation to disordered use in the college student population. This correlational study administered through SONA will use two self-report measures: the Social Media Disorder Scale and the Motivation for Social Media Use Scale. We anticipate significant relationships between disordered social media use and inherently negative social media use motivations. This research may advance understanding of the relationship between unhealthy social media use and an individual's motivations for use in order to better understand the lasting impacts of social media usage on mental health.

University of Central Florida

Nano-Scale Spectroscopy and Imaging of Biological Assemblies

Ryan Mead & Oscar Sang

Alfons Schulte

We investigate bio-assemblies on the nano-scale employing scanning near-field optical microscopy (SNOM). Vibrational bands probed by infrared absorption and Raman scattering are sensitive to chemical bonding and provide a 'fingerprint' of the sample under study. The probe light illuminates the tip of an atomic force microscope - acting as an antenna - resulting in extremely localized excitation of the sample below the diffraction limit. Highly monodisperse polystyrene nano spheres in sizes ranging from 50 to 500 nm was used for instrument verification and standardization of experimental procedures. Individual Escherichia coli (E. coli) was imaged since they have been used as a model system for biomolecular studies. We further present near-field optical images tobacco mosaic virus (TMV). This research contributes to the understanding of structural characterization of biological assemblies on the nanoscale by real-space imaging and may ultimately lead to improvements in clinical analysis in drug efficacy.

University of Central Florida

Examining the Effect of a High Fat Diet on the Expression of Adipokines in a Murine Model of Barrett's Esophagus

Saagar A. Shah

Dr. Claudia Andl

Obesity is a known risk factor in the development of Barrett's Esophagus, where the squamous cells of the esophagus are replaced by columnar cells due to chronic acid reflux. Barrett's Esophagus is one of the only known risk factors for Esophageal Adenocarcinoma, a highly lethal cancer. The high lethality of Esophageal Adenocarcinoma has been linked to the difficulties in diagnosing the condition before it progresses to its high mortality stages. Recent research has characterized obesity as a metabolic disease through the dysregulation of adipose tissue-derived signaling molecules called adipokines. In obesity, the release of adipokines favors a pro-inflammatory environment, and increases in inflammation have long been associated with cancer development. We hypothesize that a high-fat diet accelerates the carcinogenesis of Barrett's Esophagus and is associated with the increased release of pro-inflammatory molecules. We utilized histological staining to determine the impact of a high-fat diet on the carcinogenesis of BE and immunofluorescent staining to elucidate the associated alterations in Adiponectin, AdipoR1, AdipoR2, and Leptin. Contrary to our hypothesis, we have found that a High-Fat diet doesn't significantly affect the final incidence of Esophageal Adenocarcinoma, and the expression of Adiponectin was upregulated in the current mice tested, regardless of diet. Understanding the molecular alterations in Barrett's Esophagus, such as changes in adipokines, may lead to the development of biomarkers for early detection and monitoring, potentially reducing the mortality rates of Esophageal Adenocarcinoma.

University of Central Florida

Genomic Epidemiology of Staphylococcus aureus Sequence-type 72

Sachitaa Senthilkumar & Eva Armao

Dr. Taj Azarian

Staphylococcus aureus (SA) is a gram-positive bacterial colonizer and pathogen commonly carried on the skin and in the anterior nares of humans.

SA colonization may lead to a variety of non-invasive (e.g., skin and soft tissue infection, SSTIs) and invasive (e.g., bacteremia and osteomyelitis) infections. The SA population is comprised of multiple lineages that can be delineated through multi-locus sequence typing (MLST), which compares nucleotide sequences within seven housekeeping genes. Strains belonging to an MLST share a common evolutionary history as well as phenotypic characteristics such as antibiotic resistance or virulence. As a result, the epidemiology of lineages can be distinct from one another. One such MLST, sequence type 72 (ST72) is an emerging community-associated (CA) and healthcare-associated (HA) lineage made up of both methicillin-resistant and methicillin-susceptible (MRSA and MSSA) strains. To characterize the epidemiology of ST72 and track its emergence, we performed an extensive literature review and meta-analysis of SA genome sequences belonging to ST72. We found that ST72 has been associated with healthcare transmission and is frequently isolated from blood, sputum, and SSTIs among patients hospitalized in the ICU. This lineage is prominent in the United States, China, and South Korea and is known for its antibiotic resistance and virulence. In eastern countries, ST72 has also been associated with zoonotic infections, which may have potentially contributed to its spread. Currently, we are performing genomic and phylogenic analysis to assess the geographic distribution and rate of spread.

University of Central Florida

Femicide Across Borders: South Korea vs. USA

Sadeel Ghazawnah

Joanna Sackel

In South Korea, reports suggest that up to 84% of violent crimes against women are perpetrated by intimate partners, highlighting a troubling pattern of gender-based violence. This study investigates femicide, the killing of women, as a growing issue in South Korea, exploring its cultural, societal, and systemic roots. By comparing South Korea with the United States, this research examines how both countries address femicide through legal measures, public awareness, and prevention efforts. Statistical data and case studies illustrate the stark contrasts and surprising parallels in how femicide is treated, offering insights into the role of cultural norms and policy effectiveness. This study aims to not only explore on the severity of femicide in these two nations but also contribute to a broader understanding of how societies can better protect women from gender-based violence.

Lynn University

Activation of human microglia by LPS and neurotensin and human mast cells by Substance P release chemokine IL-8 that is implicated in neuroinflammatory and neurodegenerative disorders

Sai Puneeth Kothuru & Rhitik Samir Joshi

Baskaran Chinnappan, Geeta Ravindran; Kempuraj Duraisamy; Theoharis Theoharides

Neuroinflammation mediated by microglia plays an important role in the pathogenesis of various neuroinflammatory and neurodegenerative disorders. Mast cells are immune cells that are implicated not only in allergic diseases but also in certain neuroinflammatory conditions. Activation of microglia and mast cells leads to the release of several proinflammatory mediators such as cytokines and chemokines including interleukin-8 (IL-8)/chemokine (C-X-C motif) ligand 8 (CXCL8) that exacerbate neuroinflammation. Lipopolysaccharide (LPS), a component of gram-negative bacteria is a neurotoxin and induces neuroinflammatory responses. Neuropeptides substance P (SP) and neurotensin are involved in the neuroinflammatory process by activating microglia and mast cells. Mast cells are present close to SP-positive nerves in many tissues and dura matter suggesting the involvement of mast cells in neurogenic inflammation. In this study, we investigated the effect of LPS, neurotensin, and SP on IL-8 release from human microglia cell line (HMC3) or human mast cell line (LADR) using an vitro culture system. Microglia were treated with LPS (10 ng/ml) and neurotensin (50 ng/ml), while mast cells with SP (4 μM) for 24 hours. IL-8 released into the culture culture media was quantified in the culture by enzyme-linked immunosorbent assay (ELISA) using commercial kits. The results demonstrated that LPS and neurotensin significantly increased IL-8 release from microglia and that SP significantly increased IL-8 from mast cells (unpaired t-test, $p<0.05$). These findings suggest that LPS and neurotensin activate microglia, and SP activates mast cells and releases IL-8 which could exacerbate the neuroinflammatory process that is implicated in various brain disorders.

Nova Southeastern University

Dietary Supplement use amongst NOVA undergraduate students

Salena Patra

Dr. Andrea Charvet

Dietary supplements are intended to add to or supplement the diet and are different from conventional food. They contain dietary ingredients

like vitamins, minerals, herbs, amino acids, enzymes, and more. They come in many forms, including tablets, capsules, liquids, powders, bars, or gummies. Most of the US population does not meet the daily requirements of various vitamins and minerals. Sales of dietary supplements have increased dramatically, driven by an aging population and a growing interest in preventative health. Socioeconomic variables such as income, education, employment, housing instability, and food insecurity can influence the use of vitamin supplements. This study aims to investigate what socioeconomic variables significantly impact dietary supplement consumption among undergraduate students at Nova Southeastern University (NSU). Secondary aims include determining what is driving the increase in sales of vitamin supplements and the demographics of the buyer pool. Supplement use may not provide the desired effects since they often include isolated nutrients and carry over consumption risks Thus, a healthy diet is preferred. All NSU undergraduate students will receive an email with an invitation to complete an anonymous survey. The survey will include questions about socioeconomic variables such as income, education, employment, housing instability, and food insecurity, and questions about dietary supplements use. Data analysis will examine the relationship between socioeconomic variables and supplement use. Results from this study can be used to educate undergraduate students on dietary supplement use and the risks involved with overconsumption and promote healthy habits.

Nova Southeastern University

Information Overload

Salvador Victor

Akeemia Clements

Information Overload: Spam, Audiovisual Content and the Attention Span of Consumers

This exploratory research examines how the rise of spam content creation is impacting the quality of audiovisual media and the attention span of consumers. In today's digital age, platforms like YouTube, Instagram, and others have monetized engagement, driving creators to prioritize clicks, likes, and views over substance. As a result, low-quality, clickbait-driven content has become a widespread issue, especially with the rise of short vertical reels that dominate the online media landscape. This scholarly examination explores how these digital platforms influence not only the quality of audiovisual content but also how they affect consumer behavior and focus. Utilizing the uses and gratification theoretical framework, the study scrutinizes the idea that spam content creation is driven by the race for revenue and engagement, which in turn has caused a shift in audience preferences, favoring quick, easily digestible content over more meaningful or substantive works. Using qualitative methodology, the investigation delves into why audiences consume this kind of content. The findings highlight that the overemphasis on quantity has led to an oversaturation of superficial content, reduced attention spans, and shallow engagement with media. Therefore, to create a healthier digital media ecosystem, it will be important to find a balance between easily consumable entertainment and high-quality, meaningful works. The discussion underscores the need for digital platforms, creators, and audiences alike to rethink their priorities as well as to create a balance that will be essential moving forward.

Bethune-Cookman University

The Role of Tallahassee, Florida, in the Civil Rights Movement

Samantha Hall

Dr. Daniel Beugnet

In this research project, I will explore the events of the Civil Rights Movement that happened in Tallahassee, Florida, the capital of Florida and home to Florida A&M University, an HBCU that played an important role in the Civil Rights Movement. I will conduct this project by first carrying out a literature review exploring actions taken by Civil Rights Movement activists in the Tallahassee area. Then I will carry out qualitative interviews with local participants in the Civil Rights Movement. My goal is to identify gaps in our knowledge about the contributions of Tallahassee activists to the broader Civil Rights Movement nationally.

Tallahassee State College

Kaempferol Exerts Selective Cytotoxicity against Glioblastoma Cells

Samantha Jacynth Louis

Chukwumaobim D. Nwokwu Ph.D.

Glioblastoma is the most prevalent primary brain tumor that originates from neuron-supporting cells called astrocytes. Its aggressive nature makes it intractable for early diagnosis and treatment. Thus, to improve the chances of survival from the current 12–15 months for patients undergoing treatment, more effective and safer chemotherapeutics

are urgently needed. With well-documented bioactive properties, recent research efforts have propped up kaempferol to have anticancer properties. This study seeks to add to the growing body of evidence. The cytotoxic potential of kaempferol against human glioblastoma cells (LN-229) was investigated by evaluating the cellular metabolic activity, using the MTT (3-(4, 5-dimethylthiazolyl-2)-2, 5-diphenyltetrazolium bromide) assay. The treatments were done with six dosages (6.125, 12.5, 25, 50, 100, 150, and 200 µM) across three incubation periods (24, 48, and 72 h). The results demonstrated a significant ($p<0.05$) cytotoxic effect by kaempferol against glioblastoma cells, which compares closely to a positive control, puromycin, and was supported by cytomorphological evaluations. When tested against healthy human astrocytes, there was no significant effect on cell viability. Furthermore, DNA extracted from the 48 h-treated cells were subjected to an agarose gel electrophoresis, which confirmed DNA fragmentation. The antioxidant property of kaempferol was maintained after co-incubating the LN-229 cells with a known free radical scavenger, N-tert-butyl-α-phenylnitrone (BPN). Our results suggest that kaempferol has a strong cytotoxic effect against glioblastoma and has the capacity to override antioxidant-induced drug resistance. Given its relatively less cytotoxicity on healthy cells, kaempferol can be considered for further pre-clinical evaluation in the treatment of glioblastoma.

Florida Gulf Coast University

Smart Platform for Intelligent Dynamic Exploration and Robust Walking (S.P.I.D.E.R.)

Samantha Kammerer & Ethan Shelstad

Dr. Maher Amer

This project will design and build a robot for applications in inaccessible and remote environments that can maintain stability after the loss of a leg. Currently, most robots in these environments are designed to move using wheels, which can only handle certain terrain. In contrast, legged robots are less restricted in their movements. However, if one leg is damaged or rendered useless, the robot becomes unstable. To maintain stability after leg loss, more legs can be added. For example, a hexapod (six-legged robot) will be able to support itself on at least two legs while walking. Previous research has achieved adequate levels of compensation in hexapods, but have varied results on the body's stability, which can affect payloads. To increase stability, this study will create an eight-legged prototype. The leg design is inspired by the segmented legs of spiders, with four degrees-of-freedom in each leg. While operating, the robot will analyze positional data in real-time to adjust the tilt of the body based on pre-programmed parameters. To gather the most accurate data, a leg will be fully removed when testing for stability after leg loss. For testing, the robot will run a predetermined course before and after a limb has been removed, and the mean tilt error (the difference between nominal parameters and maximum tilt) will be analyzed. Compared to hexapods, it is expected that the body will be 20% more stable after limb loss, and able to recover stability 60% faster from the loss event.

University of West Florida (UWF)

Summer Fashion Trends Among College Students in the United States and Italy

Samantha Luc & Dr. Wendy Chase

Dr. Alessandro Cesarano

The research project compares and contrasts the summer fashion trends of college students across various regions of the United States and Italy. With the rise of the internet and social media, studying youth culture in different populations gives insight into the rise of globalization and international trends. The time spent in college is known to be a time of freedom, creativity, experimentation, and discovery. Clothing, footwear, jewelry, and accessories are all components of an outfit influenced by factors such as climate, lifestyle, occasion, and individual preference. Through the utilization of fashion and personal style, college students can express their individuality and personal values. The project's research methods consisted of observation, field research, and brief interviews to study the population of college students in metropolitan and suburban areas of Florida and Italy. Notes were taken on young adults' apparel, jewelry, accessories, and styling techniques in various cities of each nation. Italian and American college students were interviewed about their perspectives on summer trends and staple clothing items. Questions pertained to fashion trends in their country and their views of American and Italian fashion. Aside from cultural and regional differences, American and Italian summer fashion trends among young people are found to be relatively similar. The significance of the research study lies in the positive effects of globalization through embracing international fashion trends, taking inspiration from different cultures, and preparing for a culturally diverse environment in academic and professional settings.

Florida SouthWestern State College

A Tale of Two Networks: Unraveling the Role of Crime Generators and Attractors in Neighborhood Offending Patterns

Samantha Waterston

Dr. Yujie Hu

A clear understanding of why crime occurs in some locations and not others is essential for developing effective crime prevention policies and improving policing efforts. For this reason, criminological research often focuses on figuring out how crime spreads and who is more likely to become an offender. However, there is limited research on how socioeconomic factors across different neighborhoods contribute to the formation of crime patterns. To address this gap, this study focuses on identifying crime "generators" and "attractors" at the census block group level to explore if there are unique socioeconomic patterns in areas where offenders converge (attractors) and areas where many offenders come from (generators). Using crime location and home address data from the Tampa City Police Department, two networks were created to visualize the connections between census block groups: one of the home locations of offenders and one of the crime locations. The ties between block groups (the network nodes) represent an instance where those two block groups sent or received an offender to another block group. That way, the networks will illustrate which block groups significantly contribute to sending or attracting crime. Exponential Random Graph Models (ERGM) and regression analysis tests were used to analyze the significance of the network structure and the socioeconomic variables studied. From these results, we can better understand the socioeconomic factors that generate or attract crime, which will help make policing and crime prevention efforts more effective.

University of Florida

The Psychological Effects of Prison on Pregnant Female Inmates

Samantha Yearwood

Dr. W. Steven Saunders

Pregnant female inmates face a range of unique challenges that significantly impact both their mental health and maternal outcomes, yet exhaustive research on this population remains limited. This study aims to examine the experiences and conditions of incarcerated pregnant women across state and federal prisons, focusing on psychological effects, access to prenatal care, histories of abuse, and practices such as shackling during childbirth. The research utilizes a mixed-methods approach, combining surveys and semi-structured interviews to gather data from incarcerated women in three selected Florida prisons: the Federal Correctional Institution in Tallahassee, the Federal Correctional Institution in Marianna, and the Lowel Correctional Institution in Ocala. By standardizing data collection across different prison environments, the study seeks to increase the consistency of current data and improve the generalizability of results. The research will explore how numerous policies between state and federal prisons affect the health and well-being of incarcerated pregnant women. Initial findings suggest that significant disparities exist in the psychological and physical care provided to pregnant female inmates, with state prisons exhibiting more variability in care compared to the standardized procedures of federal prisons. This study emphasizes the need for trauma-informed care, better prenatal support, and uniform policy implementation, along with the possibility of well-founded policy recommendations aimed at improving the care and treatment of incarcerated pregnant women.

University of Central Florida

Barriers And Facilitators To Music Therapy Implementation In Nursing Homes For Dementia Patients: A Scoping Review

Samanthaka Nandam

Dr. Latarsha Chisholm

Nursing homes provide care to vulnerable populations, with many residents living with dementia. The majority of nursing homes residents living with dementia in nursing homes experience behavioral and psychological symptoms of dementia (BPSD), such as anxiety, loneliness, and agitation. BPSD can be difficult for residents living with dementia and nursing home staff that provide care for these residents. Music therapy is a non-pharmacological alternative for dementia care to reduce BPSD. Prior literature indicates several benefits of music therapy such as decreased agitation, improved connection, and better cognitive functioning. However, the implementation of music therapy is limited across nursing homes, with few studies focusing on enablers and barriers to implementing music therapy in nursing homes. The purpose of this study is to conduct a scoping review to identify the barriers and facilitators to implementing music therapy in nursing homes. This research will bring together healthcare disparities, medical humanities, and dementia care. Future research could implement music therapy nursing

homes with residents living with dementia while integrating strategies to mitigate barriers and enhance facilitators.

University of Central Florida

Exploring Gender Differences in Perceptions of AI's Impact on Social Media

Samkit Bothra

Dr. Monica Escaleras

Artificial Intelligence (AI) is increasingly shaping social media through content personalization and moderation, raising questions about its influence on public opinion and trust in digital news. Gender plays a key role in shaping perceptions of AI's impact, with men and women potentially viewing its applications differently. This study explored gender-based perspectives on AI's role in social media, focusing on its effects on information credibility and privacy. Data from 155 participants, collected via Amazon Mechanical Turk, were analyzed using IBM's SPSS. The first hypothesis proposed that women would be more skeptical than men about AI's use in news, citing greater concerns over misinformation. The second suggested that women would view AI as less problematic when applied to creative content. The results confirmed these hypotheses and were statistically significant at the 1 percent level. Women were more likely than men (56.3% vs. 43.4%) to see AI as 'somewhat beneficial' for creative content applications. However, they also expressed greater caution about AI-generated news, with 37.5% of women strongly agreeing that AI contributes to more believable fake news, compared to 18.4% of men. These results indicate that women perceive AI as more beneficial for creative purposes but harbor greater concerns about its role in spreading misinformation. Understanding these gender-based differences can guide the development of AI tools that better address diverse concerns, enhancing both trustworthiness and user satisfaction on social media platforms.

Florida Atlantic University

Bacterial Art: Connecting Art, Biology, Engineering and Entrepreneurship

Sammi Rather, Rylie Brooker, Anika Bhandare & Jarrod Wheelus

Dr.Mintoo Patel, Professor Garrett Lee, Mrs. Karla Respress, and Professor Andrew Polk

Science and Arts have drawn inspiration from each other since the time of Charles Darwin and Alexander Fleming and both arts and science have benefited from and contributed to technological advances. This project derives inspiration from the emerging field of Bio Art where biotechnology is used to create artwork. We integrated art, engineering, biology, photography and entrepreneurship in this project. Genetically modified E.coli strains were used as paint to create art pieces on an agar plate. E coli transformed with plasmids containing genes for chromogens such as green fluorescent protein, blue chromogen, purple chromogen, and pink chromogen were used to produce bacterial colonies of different colors. These bacteria were grown on LB agar plate containing Ampicillin to maintain selective pressure and isopropyl ß-D-thiogalactopyranoside to induce the expression of chromogen gene. Initially, art principles were used to create a template for the artwork. Some designs required stamps of unique designs which were created with 3D printing using Solidworks software. Finally, cell cultures were used as paint to draw designs on agar plates. The plates were then incubated for 48 hours in a 37oC incubator, after which colorful designs were visible because of growth of bacteria into bacterial colonies. Images of the bacterial designs were captured following photography principles and used to create displayable art pieces. Finally, the art was used to create sellable items to establish a small business model. This interdisciplinary project served a learning opportunity for art, engineering, photography and molecular and micro biology principles.

South Florida State College

The Black Panther Party and the Pursuit of an Equitable America

Samuel Addo

Benjamin Young

It is undeniable that inequities exist in America, especially for black people. While we often think of progress toward equality as happening linearly, history shows that there have been times of great progress for African Americans, followed by periods of latency and regression. The Black Panther Party calls to mind a time in America when black people moved toward an equitable society. Despite that historical reality, there exists a vilification of the Black Panther movement, as well as the socialist ideals they represented. Through an investigation of the Black Panther Party, their actions, goals, and accomplishments, this paper seeks to determine if core ideologies from their movement can still be applied to create a more equitable modern society.

University of South Florida

Does Activation of mTOR Promote Increased Alzheimer's Disease Pathology?

Samuel Whitehead

Nicole Verity, M.S.

Alzheimer's disease (AD) is the most prevalent cause of dementia in older adults, characterized by neurodegeneration and deficits in cognition and memory. Much research on AD etiology focuses on the amyloid cascade hypothesis, which suggests that formation of amyloid-beta oligomers is the hallmark event contributing to subsequent pathological changes. However, the causes of amyloid-beta oligomerization remain unclear. An alternative hypothesis proposes that AD is an acceleration of natural aging processes, with amyloid-beta oligomerization being a consequence of the neurodegeneration and oxidative damage associated with advanced age. The mammalian target of rapamycin (mTOR) is a signaling kinase involved in cell division, metabolism, proliferation, and autophagy, among other functions. Inhibition of mTOR has been shown to increase longevity, and mTOR expression is upregulated in the brains of AD patients. The current study aims to investigate whether activation of mTOR contributes directly to AD pathology in cultured N2a cells. Cells treated with MHY1485, a small compound known to specifically activate mTOR, will be assessed for AD-related markers, including amyloid-beta, total tau, and phosphorylated tau. Western blot analysis will be used to verify activation of mTOR and to examine changes in these markers relative to untreated controls. Treatment with MHY1485 is expected to increase amyloid-beta levels and the ratio of phosphorylated tau to total tau, indicating increased AD pathology. These findings would support the conceptualization of AD as an acceleration of natural age-related processes, informing future research into shared mechanisms between aging and AD and revealing potential therapeutic targets.

University of Central Florida

CuNi2Zn As Potential Hydrogen Evolution Reaction Electrocatalyst

Samuel Won

Dr. Michael Shatruk

Cars powered by hydrogen gas offer a more eco-friendly alternative to gasoline cars. Finding inexpensive catalysts for water fuel cells, which generate hydrogen gas from water, will greatly lower the cost of hydrogen reduction compared to conventional standards. My research is focused on creating a HER (hydrogen evolution reaction) catalyst using a copper, nickel, zinc alloy as it was calculated to be active for H2 reduction. The sample was prepared in a glovebox under an argon environment. After being pressed into a pellet, the sample was arc-melted and then sealed in a fused-quartz test tube while under vacuum. The catalyst was subsequently annealed in an 850˚ C oven for 5 days. After annealing, the sample purity was tested pre and post ball-milling by PXRD (powder x-ray diffraction). The analyses revealed three peaks from the overall crystal structure, confirming the purity of the catalyst. The sample will now be sent to the Oak Ridge National Laboratory where its performance will be tested by measuring the overpotential value. A lower overpotential indicates a more efficient catalyst. Developing a more cost-effective method for converting water into hydrogen gas has been the focus of this research, and the creation of this promising catalyst suggests a cheaper alternative to the expensive platinum electrodes usually used for HER.

Florida State University

The Ultimate Defense: Investigating Neutrophil Mechanisms Against Aspergillus Fumigatus

Samyukta Kandarpa

Dr. Matthew Wheeler

Aspergillus fumigatus is a ubiquitous fungus inhaled daily without issue by immunocompetent individuals. However, immunocompromised hosts, such as ICU patients, cancer patients, or those with genetic mutations, face a higher infection risk. To explore host-pathogen interactions, computational models have been developed. One focuses on neutrophils, which are critical to host defense, as neutropenic patients are highly susceptible to aspergillosis.

The model predicts the levels of apoptosis, NETosis (a terminal immune defense strategy of neutrophils), and fungal killing. The project goal is to validate the predictions made by this model, most importantly concerning the levels of NETosis. Experimental validation involved isolating human neutrophils, coculturing them with GFP-tagged A. fumigatus, and quantifying fungal killing through fluorescence measurement. Apoptosis was assessed via a luminescent caspase-3 assay, and NETosis was evaluated using ELISA and immunofluorescence. Through the application of a variety of drugs which can be represented through simulations, we compare the levels of apoptosis, NETosis, and fungal killing present in each culture to predictions of the model.

The role of NETosis in aspergillosis remains contentious. Initial results revealed decreased NETosis levels, contradicting model predictions. Further experiments were conducted to investigate this discrepancy, suggesting that the model, while broadly accurate, may lack critical mechanisms or misrepresent aspects of NETosis. These findings highlight the need for refining the model to enhance its predictive power for understanding neutrophil-mediated responses to A. fumigatus infection.

University of Florida

Racial Narratives, Cultural Identity, and Maternal-Infant Health: A Critical Discourse Analysis of Race and Breastfeeding in Black Media

Sanjana Bhatt & Mahi Patel

Dr. Shannon Carter

With breastfeeding rates in the United States projected to decline to 42.4% of lactating mothers by 2030, it is imperative to critically examine contemporary media portrayals of breastfeeding, particularly in the context of a growing public health crisis. Mainstream media often highlights disparities in maternity care, lactation support, and community-based resources, yet the counter-narratives surrounding Black mothers' experiences with breastfeeding have remained largely unexplored within the media discourse. This study employs critical discourse analysis to identify emerging themes in counter-narratives related to Black mothers and breastfeeding. The dataset comprises 150 articles published between 2010 and 2024 in both traditional (e.g., Dallas Post Tribune) and digital-only news outlets (e.g., The Root) with predominantly Black readership. The analysis seeks to elucidate the representations of Black mothers in relation to breastfeeding within these sources. Findings indicate a significant reliance on personal interest stories that feature individual Black mothers, Black celebrities, and Black maternal healthcare professionals as exemplars of resilience in overcoming systemic barriers to breastfeeding. These narratives challenge prior research, which often attributes lower breastfeeding rates among Black mothers to historical and cultural preferences for formula feeding, family-related deficiencies, and maternal health challenges. In contrast, the analyzed articles provide a counternarrative that critically addresses structural inequities while fostering a supportive and compassionate view of Black mothers. This analysis underscores the potential of such counter-narratives in promoting breastfeeding among Black mothers, offering a valuable alternative to traditional deficit-based discourses.

University of Central Florida

Salivary MicroRNAs: Biomarkers for Oral Cancer

Sarah Baydoun

Amy Bohan

In this comprehensive review, we aim to explore the potential role of oral cancer research in advancing the study of microRNAs in human saliva. Oral cancer remains a significant global health concern, with increasing emphasis on early detection and non-invasive diagnostic tools. MicroRNAs, small non-coding RNA molecules, have emerged as critical biomarkers due to their regulatory roles in gene expression and their altered profiles in cancerous conditions. This review synthesizes findings from key studies to examine the utility of salivary microRNAs in diagnosing, monitoring, and predicting the prognosis of oral cancer. Methodologically, these studies have employed high-throughput sequencing, quantitative PCR, and bioinformatics analyses to identify and validate microRNA signatures unique to oral cancer patients. Findings consistently highlight a subset of microRNAs that demonstrate high sensitivity and specificity as biomarkers. For instance, miR-21, miR-31, and miR-200 families have been implicated in tumorigenesis, offering insights into the underlying molecular mechanisms. The implications of these discoveries extend beyond diagnostics; they present opportunities for developing therapeutic strategies targeting dysregulated microRNAs. Future research should aim to standardize collection protocols, validate biomarkers across diverse populations, and explore integration into clinical workflows. By advancing understanding in this domain, the study of microRNAs in human saliva may revolutionize personalized approaches to managing oral cancer, ultimately improving patient outcomes and reducing healthcare disparities.

University of South Florida

Digging Deeper Into Tell Yunatsite: Insights From the 2024 Field School Excavation

Sarah Boyd

Dr. Jacqueline Meier

Tell Yunatsite, one of the oldest archeological sites in Bulgaria, is a key Chalcolithic site that offers valuable insights into the early development of complex societies in southeastern Europe. The

2024 field school was part of a larger excavation effort at the site that aims to clarify the chronology of the Chalcolithic period at Tell Yunatsite and examine the social and economic transitions that occurred during this period. The field school utilized horizontal context-based excavations with the goal of excavating down to the lowest Chalcolithic layer. To date, six Chalcolithic occupation levels have been identified. While excavations are ongoing, significant artifacts have been recovered, suggesting that the site was a culturally complex urban settlement. Future excavations will seek the oldest occupation level and examine off-tell areas to further clarify the site's chronology. This research contributes to a broader understanding of the development of complex societies in prehistoric Europe and the chronology of the Balkans.

University of North Florida

Exploring Protein Networks Driving Heart Regeneration in Axolotls

Sarah Newcomb

Whitney Stoppel

Axolotls are a valuable model in regenerative medicine due to their ability to regenerate complex tissues with minimal scarring. This capability is linked to specific proteins in the extracellular matrix (ECM) involved in tissue repair and cellular remodeling. Research comparing gene expression after spinal cord injuries in axolotls and mammals has shown that both species express many of the same ECM genes. However, the exact functions of many of these proteins are poorly understood. Moreover, the differences in how axolotls and mammals recover and remodel tissue following injury is a result of the specific dynamic biological mechanisms, which have yet to be elucidated. To shed light on the regenerative process, we are studying axolotl ECM dynamics to better understand the protein networks involved in regeneration and their potential applications in human wound healing. Specifically, we are interested in the heart, as axolotls can fully regenerate their heart when injured through driving cellular differentiation and proliferation. Utilizing histological analysis and STRING bioinformatics, we examined protein expression and interaction networks in the axolotl heart. Immunohistological staining was used to identify specific proteins within the tissue architecture. Using publicly available data, we used a protein interaction software called STRING to map protein-protein interactions crucial to ECM remodeling and inflammation regulation. Results aid in identification of ECM proteins that are important to axolotl regeneration, which can provide insight on the differences between protein networks and dynamic expression in axolotls. We expect that this work will shed light on future applications for human wound repair.

University of Florida

Catholicism, Gender-Affirming Care, and the Transgender and Gender Non-Conforming Community

Sarah Wutzler

Dr. Anna Peterson

Analysis of the relationship between Catholicism, gender-affirming care, and transgender and gender non-conforming (TGNC) communities is critical given the extensive influence of Catholic thought within healthcare systems. Limited research on this subject and the politicization of gender-affirming care makes this analysis especially valuable at this time. Through examining relevant literature, this paper reveals that Catholics often condemn gender-affirming practices and advise professionals against offering such care. Justification for this perspective is rooted in the Catholic understanding of human dignity, which includes respect for life beginning at conception and adherence to the principles of totality and integrity. Data on TGNC health outcomes shows that gender-affirming care is beneficial for TGNC individuals. Catholic hospitals retain the right to refuse provision of gender-affirming care under U.S. law; however, this refusal is a significant barrier to care for TGNC individuals, who already face disproportionate burdens when accessing care. This research reveals the connection between healthcare barriers created and/or upheld by Catholic principles and lower overall health outcomes for TGNC people.

University of Florida

The Effect of Parasitism on Coquina Clam (Donax spp.) Burial Behavior

Sarah-Kate Srivastava

Dr. Tara Stewart-Merrill

Coquina clams are known to carry the parasites Lasiotocus trachinoti and L. choanura. The former can be found in the organism's inhalant siphon, while the latter can be found in the muscular foot. What is unknown is whether these parasites have any effect on their behavior. To investigate this, 50 clams were collected from the upper intertidal zone (IUZ), studied, and then dissected. Clams of all sizes were chosen and measured to obtain sufficient data because larger clams are more likely to be parasitized. The clams were individually

placed into tubes filled with sand and seawater, then observed for three minutes. At the end of the three minutes, the depth at which they had dug was measured and recorded, along with the initial digging time. They were then dissected and examined for the presence or absence of parasites, which were subsequently quantified.

Florida State University

The Use of Cannabidiol (CBD) as a Combination Treatment for Glioblastoma

Sashank Bikkasani

Subhra Mohapatra

Sashank Bikkasani, Ryan Green, Subhra Mohapatra

Glioblastoma is a fast-spreading brain cancer that leads to death in around 93 percent of patients within 5 years. Surgical removal of the tumor from the brain can be difficult or impossible, frequently leads to recurrence, and treatment options are limited by the complexity of the brain. Temozolomide (TMZ) is the gold standard therapy for the treatment of glioblastoma, inducing cell cycle arrest through DNA mutations, specifically targeting cancerous cells. While this drug is the most popular choice of treatment, it remains to have limited success due to unresponsiveness and cellular drug resistance mechanisms. Resistance to TMZ also poses a threat, as many patients do not respond at all to the treatment. However, the use of combination treatments offers a possibility for increasing the efficacy of TMZ through synergistic pathways. Synergy is an interaction between two drugs that causes an enhancing effect when used in combination. This study aims to identify treatment options to combat TMZ resistance. We have investigated the pathways behind Cannabidiol (CBD), which induces oxidative stress on cancer cells, and tested in combination with TMZ to identify a possible synergistic relationship that will overcome TMZ resistance. In this study, we will discuss the mechanisms of each treatment, investigate their interactions in combination, and evaluate the resulting anti-tumor effectiveness in glioblastoma in vitro using two human cell lines, U87 and U25.

University of South Florida

How Intellectual Humility Affects certain Bias Blind Spots

Scott Karnes, Everett Robertson & Ingrid Escalante García

Dr. Ted Cascio

Intellectual humility (IH) is a personality variable that involves an awareness that one's knowledge is potentially susceptible to insufficiency, error, and bias. An emerging literature has demonstrated positive associations between IH and a myriad of cognitive traits, including lower dogmatism, need for cognition, and open-minded thinking.

However, the question of how IH relates to the cognitive trait of overconfidence is only now beginning to come under scrutiny and, furthermore, the results of these initial studies are mixed. One study found that IH did not predict critical thinking and also that it failed to moderate the Dunning-Kruger effect. Another study discovered small to modest correlations between IH and multiple measures of critical thinking and Dunning-Kruger style overconfidence, but only in their community sample and not in their college sample. Given these inconsistent findings, it appears that the relationship between IH and overconfidence has yet to be clearly determined.

In the current study we hope to address this question from another perspective by investigating the relationship between IH and a different form of overconfidence known as the bias blind spot, which refers to the asymmetry between self-ascriptions of bias and judgments of others' susceptibility to bias. This specifically involves a tendency to underestimate one's own level of bias while overestimating the same in other people. Given its inherently reflective and self-critical nature, we expect IH to predict a lesser bias blind spot. Thus, we hypothesize that IH will correlate negatively with this tendency.

Palm Beach State College

Fire Ants Survive Raindrop Collision Forces and Dispersed by Outspreading Drops

Sebastian Anzola & Freddy Zeas

Daren Watson

Fire ants typically build colonies in large mounds found in open areas exposed to rain. Despite extensive studies showing the fire ants' ability to

navigate flooded environments, researchers are yet to systematically investigate the survival of fire ants when impacted by raindrops. In this experimental study, we use high-speed videography to film drop impacts on fire ants and dynamically scaled spherical mimics. Drops impart compression forces, coat insects, and disperse upon direct contact. We show the fire ant's low mass and characteristic size rendering it impervious to raindrop collisions. Our study demonstrates that small land-based insects are robust to adverse weather conditions like rain.

Florida Polytechnic University

Assessing the efficacy of various myelin enhancing compounds with Lumbricus terrestris

Sebastian Lopez & Ekansh Puri

Jennifer Krill

Limited in vivo animal models and the high cost of clinical trials result in less than 10% of neurological drugs being approved each year. With rising rates of neurodegenerative diseases and substance use disorders, there is an urgent need for cost-effective and physiologically relevant methods for drug discovery. This study establishes Lumbricus terrestris as a scalable, affordable model for early-stage drug screening, reducing reliance on expensive vertebrate systems. Researchers evaluated the efficacy of myelin-enhancing compounds on action potential propagation in the medial and lateral giant fibers (MGF & LGF) of earthworms. The study compared a control group (treated with DI water) and two experimental groups: one treated with Vitamin D and the other with triiodothyronine (T3), compounds known to promote myelination in vertebrates. Worms underwent a pre-test, seven days of treatment, and a post-test to measure electrophysiological changes. Results showed significant increases in conduction velocity and action potential amplitude in the treated groups, suggesting enhanced signal propagation. Histological analysis revealed a quantifiable increase in pseudomyelin, corroborating the electrophysiological data. These findings demonstrate that the effects of myelin-enhancing compounds on Lumbricus terrestris' pseudomyelination mirror their impact on vertebrate myelination, suggesting evolutionary conservation of myelin-like mechanisms. This study highlights Lumbricus terrestris as a viable, cost-effective, and ethical model for neurological drug research. Future work will refine this model to expand its applicability in studying neurological diseases and testing novel therapeutics.

Florida Atlantic University

In silico NCS1 and DREAM Conformational Variation Based On Binding Metal Identity

Sebastian Scavuzzo & Britnis Blanco

Jaroslava Miksovska

Proteins are important macromolecules responsible for a variety of processes in living organisms. One of the most important features of proteins is their ability to respond to environmental stimuli such as intracellular metal concentration by binding metal ions which can affect structural behavior. The neuronal calcium sensor (NCS) family are Ca^{2+} binding signaling proteins which participate in a variety of intracellular signaling processes. One such signaling protein is neuronal calcium sensor 1 (NCS1) which, as its name suggests, binds Ca^{2+} along with other abiogenic metals such as Li^{+} and can go on to interact with a multitude of intracellular partners. NCS1 binds Ca^{2+} ions through the EF-hands which consist of a helix-loop-helix motif that binds the Ca^{2+} ion in the loop between helices in the EF-hand. We previously found that the identity of the binding metal has a significant impact in the conformation of NCS1. In an attempt to elucidate the nature of these structural changes, we performed a variety of molecular dynamics simulations on NCS1 in the calcium bound, lithium bound, and metal unbound states. The same calculations were performed for downstream regulatory element antagonist modulator (DREAM), another member of the NCS family to determine if DREAM responds to metal binding in a similar fashion. The effects of N-terminal fatty acid modifications of myristoylation in NCS1 and palmitoylation in DREAM on the conformational changes associated with metal binding.

Florida International University

ScrA, a novel regulator of adhesion, is controlled by a coordinated and complex network of regulation in Staphylococcus aureus

Selina Walker

Lindsey N. Shaw

Staphylococcus aureus is a gram-positive pathogen that can cause a variety of diseases in the human host, such as bacteremia and endocarditis. Its ability to colonize and disseminate throughout the body is governed by a complex web of regulation controlling myriad virulence factors. One such regulator, ScrA, has previously been characterized to play a role in bacterial clumping through control of the SaeRS two-component system (TCS), which in turn regulates secreted

and surface factors. Although downstream targets of ScrA have been identified, no information exists on the upstream regulators that impact its expression. Herein, we identified regulators of scrA using a novel high-throughput screen that couples the miniaturization of transduction with transposon mutagenesis. In so doing, we found 7 activators and 5 repressors of scrA transcription. Of these, the ArlRS TCS was found to be an activator during stationary growth, which may suggest that ScrA plays a role in S. aureus adapting to new environments. The environmental-response regulator CodY was found to activate PscrA, while the heat shock regulator, HrcA, was found to be a repressor. This suggests that ScrA abundance may be controlled by environmental conditions, enabling survival during times of heat/nutrient stress. Finally, we found that NorG dynamically modulates PscrA potentially linking ScrA to quinolone and beta-lactam resistance. Collectively, our study reveals that the transcriptional control of scrA is a complex process with global effects in diverse bacterial responses.

University of South Florida

Association Between Body Mass Index and Cardiovascular Responses During Eucapnic Voluntary Hyperpnea Among Young Adults

Sequoia Ernst

Dr. Joseph Watso

Introduction: High body mass index (BMI) is linked with exaggerated cardiovascular responses during exercise. However, the association between BMI and cardiovascular responses during hyperpnea independent of exercise is unclear. Purpose: We tested the hypothesis that higher BMI correlates with greater cardiovascular responses during eucapnic voluntary hyperpnea (EVH). Methods: Inclusion criteria were 20-45 years old, BMI <40 kg/m^2, no cardiometabolic or pulmonary diseases, uncontrolled hypertension, or nicotine use. We measured beat-to-beat hemodynamics (photoplethysmography) and ventilation (spirometry) during a 5-minute rest period and 8-minute EVH test at 60 L/min ventilation. We correlated cardiovascular responses (Δ; EVH final 30 seconds minus rest) with BMI using Spearman's rank () correlations before and after adjusting for maximal voluntary ventilation (MVV; 10-15 seconds on room air). We present data as mean±SD or median[IQR]. Results: The sample (n=22) characteristics were: 24[6] years old; 45% female; 14% Asian, 5% Black, 82% White; 36% Latinx. BMI (29.0±6.2 kg/m^2) showed weak moderate correlations with Δmean arterial pressure (ΔMAP) (19±13 mmHg; =-0.48, P=0.03) and Δheart rate (ΔHR) (12±8 beats/min; =-0.45, P=0.04). However, BMI had negligible correlations with Δcardiac output (ΔCO) (0.9±0.5 L/min; =0.02, P=0.94) and Δtotal vascular conductance (ΔTVC) (-2.7±7.8 mL/min/mmHg; =0.16, P=0.50). Adjusting for MVV (140±27 L/min) did not meaningfully affect the correlations between BMI and ΔMAP (=-0.50, P=0.02), ΔHR (=-0.47, P=0.03), ΔCO (=-0.04, P=0.85), or ΔTVC (=0.12, P=0.61). Conclusion: Contrary to our hypothesis, these data suggest a higher BMI is associated with a lower ΔMAP and ΔHR during EVH among adults with and without obesity free from overt disease.

Florida State University

Building a Bimetallic Tripod Pincer System Catalyst for Investigating Electrocatalysis of CO2 Reduction

Shaaz Mumtazali

Dr. Zhu-Lin Xie

The increase in greenhouse gas emission and the impact of climate change have prompted scientists to build artificial photosynthetic systems to reduce greenhouse gases. A key task to achieve artificial photosynthesis is to develop catalysts that convert carbon dioxide into value-added products with high efficiency and durability. Using molecular catalysts that contain bimetallic centers has been shown to dramatically increase the catalytic activity of catalysts due to the DMSC (dinuclear metal synergistic catalysis) effect of the two metal centers. However, a wide knowledge gap is present regarding how bimetallic centers cooperate in catalysis and how we can control the effects through structural modifications. To answer these questions, we propose to synthesize a series of bimetallic Co (II) tripod pincer complex to study their catalytic activity towards electrochemical CO2 reduction. The ligands feature a pyridazine bridge, amine groups, and pyridine moieties to host the metal centers. Using different R groups, such as H and methyl, the stability and catalytic activity of the catalysts can be tuned. We will utilize X-ray Diffraction, NMR and UV/Vis spectroscopy to characterize the molecular and electronic structures of the catalysts. The electrocatalytic properties of the catalyst will be studied by using cyclic voltammetry (CV) and controlled potential electrolysis (CPE) to understand the efficiency and selectivity of the catalysts towards CO2 reduction. It is predicted that this system will exhibit higher turnover frequency and stability in comparison to a mononuclear catalyst.

Florida Atlantic University

The 10 Year Check-Up: Assessing Syngnathid Populations in the Indian River Lagoon

Shakira Brown & Keyaira Waring

Dr. Sarah Krejci

Seahorses and pipefish (family Syngnathidae) are vital components of coastal marine ecosystems but face numerous anthropogenic threats, including habitat loss, overharvesting, pollution, and climate change. The Indian River Lagoon (IRL) has been significantly impacted by repeated disturbances, such as harmful algal blooms since 2010, which have degraded benthic habitats like seagrass; potentially reducing syngnathid fish populations. This study examined syngnathid fish populations in the Mosquito Lagoon and Northern IRL using data collected in the summer of 2014, and data collected in the summer of 2024. Results showed an increase in Syngnathus scovelli (Gulf Pipefish) populations over the decade, a shift in Syngnathus louisianae (Chain Pipefish) population from the Northern IRL in 2014 to Mosquito Lagoon in 2024, and the absence of the two seahorse species, Hippocampus erectus (Lined Seahorse) and Hippocampus zosterae (Dwarf Seahorse) in 2024.

Bethune-Cookman University

Decoding Parental Vaccine Decision-Making and Hesitancy through Social Media Discourse

Shania Shahab

Amy Donely

Childhood vaccinations are critical in preventing severe diseases and have saved millions of lives by boosting the immune system to fight infections. Since a majority of vaccinations are recommended to be given in early childhood, parents play a critical role in vaccination decisions, which directly influences vaccination rates. While vaccination rates began declining prior to the COVID-19 pandemic, data following the pandemic highlight a significant increase in the decline of childhood vaccination rates globally. Given the decline in vaccination rates and the role that parents play in vaccine decision making, the current study seeks to understand parent's attitudes towards vaccines and factors that contribute to vaccine hesitancy and refusal. To do this, we collected posts from 3 public parenting community boards: The Bump, What to Expect, and Baby Center. Data were downloaded between 2017 and 2024 to account for attitudinal shifts towards vaccinations during the COVID-19 pandemic. For the purposes of this presentation, 25 posts from each year were randomly selected and analyzed thematically.

Preliminary findings suggest that the factors that contribute to vaccine hesitancy and refusal among parents include fear of irreversible outcomes, risk aversion framed as autonomy, and mistrust in institutions. By understanding the factors that contribute to vaccine hesitancy and refusal, health promotion materials can be developed to target parental concerns. Further, the findings of this study can be used as a starting point for public health providers and clinicians to engage in conversations with parents who are hesitant about and/or anti-vaccination.

University of Central Florida

Microplastic Presence at surface and depth on high-density and low-density Sea Turtle nesting Beaches in Volusia County, Florida

Shaunace Bowen & Trinity Resnover

Dr. Sarah Krejci

Microplastics are prolific in marine environments worldwide and present concerns for marine species, including increased disease, exposure to endocrine-disrupting chemicals, and plastic particle ingestion. The presence of microplastics in sea turtle nesting habitats within Florida is not understood. For sea turtles, microplastics could increase nest temperature, which could impact sex determination in incubating eggs, and microplastics may be pulled from the sand's surface down to the depth of incubating eggs while females are digging. In order to determine the presence of microplastics at different depths and beaches, two high-density sea turtle nesting beaches (Ormond Beach, Ormond-by-the-Sea) and two low-density nesting beaches (Daytona Beach, Wilbur-by-the-Sea) were sampled outside of nesting season to eliminate risk to sea turtle nests. At each beach, five quadrats were sampled at the dune's edge, with sand samples collected at the surface (first 5cm) and at 70 centimeters (approximate sea turtle nest depth). Sand samples were transported back to the lab and dried, and microplastics will be extracted with a supersaturated saline solution. The extraction solution will be vacuum filtered on a 47 µm filter paper, and collected microplastics will be quantified, measured, and classified by color using a stereomicroscope and statistically compared. The results of this study will fill a knowledge gap on potential sea turtle nest exposure to microplastics at depth and among nesting beaches in Volusia County, Florida. Identifying beaches and depths with high microplastic concentrations will support further studies on direct microplastic impacts on sea turtle nests.

Bethune-Cookman University

Tooth by Tooth: Investigating Isolated Crocodyliform Teeth from the Paleocene-Eocene of Tropical South America

Shion Newsom

Dr. Jonathan I. Bloch

During the Paleocene and Eocene epochs (66–34 million years ago), certain crocodyliforms (prehistoric relatives of modern crocodiles), including sebecids in South America and the planocraniids in North America, had ziphodont (serrated) teeth. These serrations, characterized by blade-like edges with individual projections (denticles), are indicative of carnivorous terrestrial feeding habits. Publications have indicated the existence of ziphodont crocodyliforms from this time but have not yet described characteristics of the teeth in detail. The Paleocene-Eocene terrestrial fossil record of South America is largely restricted to mid-to-high latitudes, limiting our understanding of early tropical ecosystems. To address this, we studied a collection of crocodyliform teeth from two sites spanning the Paleocene and early Eocene in southern Bogotá, Colombia. The teeth show a variety of shapes and features, classified into eight main types based on their denticle and surface patterns. Uncommon features, such as split edges (carinae) and indentations, were also identified, along with some teeth resembling those of alligatoroids (caimans). Using microCT scans and microscopic imaging, we observed and measured traits like carinae shape and denticle width to compare with teeth from known sebecids and planocraniids. Results show Paleocene teeth most resemble planocraniids, while Eocene teeth most resemble sebecids. Little is known about how tooth morphology of sebecids compares to that of planocraniids, making it difficult to identify from isolated teeth. Differences in crocodyliform tooth morphology types between the Paleocene and the Eocene can provide a better understanding of faunal dynamics during increased global temperatures (Paleocene Eocene Thermal Maximum event).

University of Florida

Yoga Nidra Enhances Mood Through Neural Engagement and Sleep Modulation

Shravya Konatam & Bharath Burri

Dr. Jonathan Banks and Dr. Jaime Tartar

Yoga Nidra, a meditative practice blending relaxation and guided imagery, has shown potential as a non-invasive, accessible intervention for stress and mood disorders. This study investigated the effects of Yoga Nidra (iRest) on psychological mood and physiological markers, focusing on its neural engagement and sleep modulation in a sample of 21 college-age participants (6 males). Participants completed a Yoga Nidra condition involving EEG and EDA monitoring, followed by mood assessments using the Profile of Mood States (POMS). Neural activity patterns indicated that higher alpha and beta wave engagement during Yoga Nidra were associated with improved vigor and reduced fatigue and confusion ($p < 0.05$). Conversely, theta and delta activity, indicative of deeper sleep states, correlated with increased confusion and tension. Sleep stage analysis revealed a nuanced relationship: N1 sleep correlated with reduced confusion, while N2 sleep negatively impacted vigor and mood ($p < 0.05$). The findings suggest that active engagement during Yoga Nidra optimizes its mood-enhancing effects, whereas deeper sleep states (indicative of sleep debt prior to Yoga Nidra induction) may counteract these benefits. This provides insights into the physiological mechanisms underpinning Yoga Nidra's efficacy. This study also underscores Yoga Nidra's dual role in stress reduction and mood improvement, offering promising implications for its integration into mental health and wellness programs. Further research is needed to explore its long-term benefits and applications across diverse populations.

Nova Southeastern University

Exploring the Role of Relaxin-3 Peptides in Metabolic and Eating Disorder Pathophysiology

Siddharth Yerrajennu & Junjie Zheng

Dr. Stuart R Maudsley

Relaxin-3 peptide is a neuropeptide that plays a vital role in physiological processes, including metabolism, learning, and memory. Relaxin-3 profoundly impacts appetite regulation in the context of metabolic and eating disorders. Through meticulous research, the correlation between Relaxin-3 and its influence on appetite regulation in the context of metabolic and eating disorders is the determinant of the RXFP3 receptors. To consolidate the data, our team has utilized sources from Google Scholar and PubMed to articulate a detailed explanation of the information to best address the research question: How does Relaxin-3 influence appetite regulation in the context of metabolic and eating disorders? In this unbiased analysis, it was determined that the increased expression of Relaxin-3 and its activation of RXFP3 receptors in the hypothalamus correlates with increased appetite, and increased food intake in

animal models or metabolic disorders has had an impact on appetite regulation. Surprisingly, the lowering of the activity of the Relaxin-3 pathways in subjects with binge-eating behaviors resulted in food consumption, and weight stabilization was observed. Relaxin-3 peptide impacts the appetite regulation of metabolic and eating disorders through the various pathways that utilize receptors like RXFP3 within the hypothalamus region of the brain and how those behaviors result in the reduction of food consumption and weight stabilization. Despite the overwhelming evidence that supports the impact of RXFP3 receptors, it is imperative to determine other receptors that have a notable impact on the metabolic processes of Relaxin-3 peptides.

University of South Florida

Entrepreneurs Make You Fly: The Business of Private Aviation

Sierra Nevins

Dr. Fernando D'Andrea

Using entrepreneurship theory, we investigate the private aviation industry, excluding corporate aviation, and how it proposes value to its consumers. To do so, we rely on secondary sources and, especially, on primary ones. We interview over twenty entrepreneurs involved in different parts of this industry - airport owners and operators, private flight brokers, private jet companies, original equipment manufactures, software developers, and more - and its value proposition chain. Contrary to the common conception about commercial aviation, the private aviation industry is guided by entrepreneurs and uses a lot of specialization, division of labor and coordination. Entrepreneurs in this industry must deal with constant changes in the market, in technology and in the regulatory environment to keep their businesses afloat. We see the private aviation industry as an insightful proxy to how understand entrepreneurship in general and how the market as a whole works.

Embry-Riddle Aeronautical University

Survey of Reproductive and Digestive Health Symptoms: The Effects Oral Hormonal Contraceptives on Young Women's Health

Silviana-Elena Buzatu

Jeffrey E. Cassisi

The research project seeks to investigate the side effects of oral hormonal contraceptives from a gastrointestinal standpoint. I am interested in investigating how oral hormonal contraceptives can affect gastrointestinal functioning in otherwise healthy young women. In addition, the menstrual cycle is taken into consideration when looking at adverse reactions caused by oral hormonal contraceptives. A survey methodology will be employed, using the SONA system available at UCF, which is a platform where General Psychology students are required to participate in studies as part of their coursework. Female students will be asked if they use contraception, and if so, what kind. The survey also contains items that ask about demographics, general health, gastrointestinal symptoms, and the menstrual cycle. I plan to compare the gastrointestinal symptoms of the participants who are currently on oral hormonal contraceptives to participants who report they are currently not on it. I hypothesized that the participants on oral hormonal contraceptives will show more symptoms of gastrointestinal distress than the participants who are not. While I plan to look for disruptions in the menstrual cycle as well, the literature tells us that birth control is oftentimes used to stabilize menstrual distress, so I do not predict that there will be any distress reported in the group of participants who take oral hormonal contraceptives. The literature on this topic is limited, which is why further research needs to be done to help providers inform patients about potential risks, making patients feel more confident in their decisions.

University of Central Florida

CD25-targeted IL-2 therapy during Influenza A virus infection does not impede the generation of virus-specific antibody

Siva Annamalai

Dr. Tara Strutt

Influenza A Virus (IAV) remains a global health concern despite widespread vaccination efforts. Therapeutics to improve outcomes of severe IAV infection are currently lacking. While anti-viral drugs effective against IAV, such as Oseltamivir (Tamiflu), are approved for use, they are only effective if provided within 48 hours of infection. CD25-targeted IL-2 is a promising biotherapeutic that improves pulmonary function and suppresses virus-induced bronchial inflammation when administered 2-4 days post infection, which is a wider therapeutic window than the previously mentioned anti-viral drugs. Whether and how CD25-targeted IL-2 driven expansion of an anti-inflammatory population of T regulatory CD4 T cells impacts the generation of humoral immunity against IAV remains to be determined. We examine here the generation of IAV-specific

neutralizing antibody responses in the serum and bronchioalveolar lavage (BAL) of IAV-infected mice either PBS (control) or CD25-targeted IL-2 treated 2-4 days post primary IAV infection. We also characterize the effects of CD25-targeted IL-2 administration on the generation of antibody responses against IAV proteins containing non-neutralizing epitopes. Our findings show that reciprocal endpoint IAV-specific neutralizing and non-neutralizing antibody titers in the convalescent sera and BAL of treated and control untreated mice are comparable. Moreover, the avidity, or how strongly the antibody binds its specific epitope, of the IAV-specific antibody generated is not impacted by CD25-targeted IL-2 therapy suggesting that somatic hypermutation events in B cells are not impaired. Collectively, these observations support that therapeutic CD25-targeted IL-2 administration during primary IAV infection does not suppress the generation of long-lasting humoral immunity against IAV.

University of Central Florida

NGC 2168 Cluster Age

Skylar Butler

Ted von Hippel

This research investigates the precision and accuracy of age determination in open star clusters using the astrostatistical software package BASE-9. The project is divided into two parts. First, the collective properties of the selected cluster, NGC 2168, are analyzed to derive its age by other researchers in our team. Second, we derive the ages of individual stars within this cluster, again using BASE-9. We will evaluate the reliability and validity of the age determinations by comparing the results for individual stars with those of the cluster. This research aims to contribute to the understanding of precision in age determination for both star clusters and individual stars. This research will also advance the knowledge of stellar evolution and star cluster properties.

Embry-Riddle Aeronautical University

What is the Relationship Between the Perceived Availability of Third Places and the Self-Reported Loneliness of Gen Z?

Skylar Holm-Martinez & Skyler Krampitz

Dr. Benjamin Graydon

Due to the enmeshment of online communication in daily life, individuals are no longer bound to the borders of in-person socialization, which once primarily occurred in spaces of recreation or the third place. Prior research has already explored the relationship between loneliness in individuals in years where digital media use increased and face-to-face communication decreased (Twenge et al., 2019). The present study aims to explore further the relationship between the perceived availability of third places and self-reported loneliness, specifically as it pertains to Gen Z. Researchers utilized a modified version of the UCLA Loneliness Scale (Russell et al., 1978). The researchers collected data from 82 Daytona State College students and evaluated the rate of self-reported loneliness in relation to perceived available third places. The survey results indicated statistically significant evidence that students who did not visit third places reported higher levels of loneliness compared to those who frequented them. The study's results were limited because data was collected exclusively from Daytona State College students, and the survey was available only for seven days. Future research should explore the possible substitution of physical third places for online third places.

Daytona State College

Role of Latrophilins in Cancer Biology

Sneha Bhaskarla & Sharmitha Suresh

Dr. Stuart R Maudsley

Latrophilins are a group of G protein-coupled receptors that function in controlling the release of neurotransmitters, regulating cell life, and the maturation of synapses. Latrophilin 3, also known as LPHN3, is one of the members of this family and has been shown to play a key role in cancer progression. Studies have found that LPHN3 exists as a downstream effector of the androgen receptor, resulting in tumor growth of urothelial, bladder, and prostate cancer. However, this also makes LHPN3 a potential target for therapies treating cancer. Also, LPHN3 has been studied concerning breast cancer where LPHN3 is differentially expressed in the healthy and tumorous sections of those with this disorder. These findings are corroborated by research showing lower levels of LHPN3 expression and mRNA in ependymoma cells, forming tumors in the brain or spinal cord. LPHN3 has been shown to regulate cell motility and cell signaling through mutations in its GAIN domain, which is a protein domain found in many cell surface receptors and affects cancer cell growth. In this study, the use of secondary sources, particularly articles, will evaluate the correlation between LPHN3 and expression of this receptor in diverse types of cancer cells to gather evidence about the Latrophilin functions. Although the research relies on external datasets, there is much available public

data to analyze the connection between LPHN3 activity and cancer biology. The overall findings support the vital purpose of Latrophilins in cell expression and cancer progression, but further research is needed to elaborate the significance.

University of South Florida

Investigating Mechanisms of Antioxidant Treatment on Drug Resistant Breast Cancer

Sofia Ines Cuello

Dr. Kimberly Dobrinski

Understanding mechanisms underlying cellular drug resistance is essential for addressing the rise of drug-resistant breast cancer (BC). The Warburg effect facilitates aggressive cancer cell proliferation by promoting metabolic shifts that favor glycolysis. While antioxidants demonstrate potential as cancer treatment, their effects on BC is complex. A transition to aerobic respiration (OXPHOS) in BC induces oxidative stress and leads to accumulation of reactive oxygen species (ROS), as these cells lack the compensatory mechanisms to adapt to such changes. Shikonin (SHK) is an antioxidant that induces mitochondrial dysfunction and apoptosis in cancer cells, potentially linked to this metabolic shift. This study will elucidate that SHK modulates the metabolic function of drug resistant BC by facilitating a transition from Warburg to OXPHOS. To evaluate these effects, we employed an experimental protocol involving MCF7 (non-drug-resistant), MDA-MB-231 (drug-resistant), and MCF10A (non-cancerous epithelial) breast cells. We assessed cell viability, metastatic potential, oxidative stress, oxygen consumption, and gene expression. Results demonstrate that SHK significantly induces cell death in MCF7 and MDA-MB-231 cells at concentrations of 16, 20, and 24 µM over 24 hours, compared to untreated and DMSO-treated controls ($p < 0.01$). Furthermore, cancer cells exhibited significant differences in oxygen consumption in relation to SHK concentrations and cell type ($p < 0.01$). However, ROS production in MCF7 cells did not show significant variation over time ($p < 0.55$), as MCF7 cells grow via OXPHOS. These findings support our hypothesis, with ongoing analysis.

University of Tampa

Effects of media composition and temperature on the morphology and motility of a halophilic archaeon

Sofia Jolley

Jamel Ali

Biohybrid micro-swimmers inspired by motile microorganisms hold significant promise as delivery vectors capable of navigating complex fluids, especially with regards to biomedical applications. However, a major challenge is to optimize their swimming kinematics and biocompatibility. Archaea have seldom been studied but are capable of functioning in extreme environments such as low pH or high salinity. Moreover, they have yet to be identified as human pathogens, making them an ideal candidate for fabrication of biologically based microrobots for biomedical applications. To create an efficient bio-hybrid micro-swimmer using an archaeon, their motility must first be characterized and optimized in their natural environment. In this work the effect of media composition, namely salinity and type of salt, and temperature were investigated with respect to their effects on the shape and swimming kinematics of Halobacterium salinarum. It was determined that H. salinarum cells retain their morphology and motility in salt media with less than 1M salts in room temperature environments, demonstrating adaptability beyond their recorded optimal growth temperature of 42˚C and salinity of 4M NaCl. The dependence of morphology on the salt concentration and motility on ambient temperature is characterized. These findings provide valuable insights into optimizing the swimming efficiency of biological microswimmers under varying environmental conditions and pave the way for the development of archaea-based bio-hybrid microswimmers.

Florida State University

Evaluating Inhibitor Performance for Corrosion Protection of Post-Tensioned Tendons

Sofia Paula Cherrez Reivan

Dr. Christopher L. Alexander

The durability of post-tensioned steel tendons in corrosive environments depends significantly on the effectiveness of corrosion inhibitors. This study evaluates the time-dependent performance of various inhibitors applied to steel strands, with a focus on their mechanisms of action and impact

on corrosion rates. Electrochemical impedance spectroscopy (EIS) and open-circuit potential (OCP) are used to monitor corrosion behavior, while optical damage surveys (ODS) provide complementary visual assessments of corrosion damage over time.

Steel samples are treated with a range of corrosion inhibitors, including organic, inorganic, and hybrid formulations, and exposed to simulated corrosive environments. EIS measurements track changes in polarization resistance, capacitance, and charge transfer processes, offering insights into inhibitor film stability and electrochemical barrier properties. OCP data provide early indications of corrosion susceptibility, while ODS characterizes surface-level damage, enhancing the understanding of inhibitor performance.

Mechanistic analysis of the inhibitors explores their adsorption behavior, film-forming capabilities, and ion-blocking effects, linking chemical composition to observed protective performance. Results reveal distinct variations in inhibitor efficiency, with certain formulations demonstrating superior resistance to corrosion initiation and progression.

This study contributes to the development of advanced corrosion protection strategies, enhancing the longevity and safety of critical infrastructure.

University of South Florida

Targeting STAT3: An Approach to Reducing Neuroinflammation in Autism Spectrum Disorder

Sofía Profeta

Dr. Hector Gomez

Autistic Spectrum Disorder (ASD) is a neurodevelopmental disorder that involves chronic neuroinflammation of the brain and is characterized by difficulties in learning, behavior, and social interactions. Signal transducer and activator of transcription 3 (STAT3), a transcription factor involved in Th17 cell differentiation and activated by cytokines such as IL (interleukin)-6 and IL-17, plays a key role in regulating neuroinflammation, a hallmark of ASD. The aim of this literature review is to explore the role of STAT3 activation and its potential contribution to neuroinflammation in ASD. A systemic analysis of 42 peer-reviewed articles containing the keywords “STAT3” and “Autism” was analyzed from the PubMed database, with articles screened for relevance to the topic. Current literature consistently demonstrates that STAT3 activation is influenced by factors, including elevated levels of pro-inflammatory cytokine, exposure to environmental stressors, and maternal immune activation (MIA). Studies indicate that MIA elevates IL-6 levels, which subsequently activates the STAT3 pathway, promoting neuroinflammation in newborns later diagnosed with ASD. Moreover, experimental models reveal that inhibition of STAT3 signaling reduces pro-inflammatory cytokine production, highlighting its therapeutic potential. These findings suggest that STAT3 plays a pivotal role in mediating neuroinflammation associated with ASD. Further research should focus on establishing a direct causal link between STAT3 activation and the development of ASD, as this could open avenues for targeted therapeutic strategies aimed at mitigating neuroinflammation and improving clinical outcomes for individuals with ASD.

University of South Florida

Prestige Orientation and Crucial Feedback

Sofia Villanueva

José Martínez M.S.

Providing honest and transparent feedback is crucial for bettering the performance of group members and thus is a form of cooperation. Despite the prosocial nature of such behavior, providing critical feedback can be awkward and risks damaging the relationship with the recipient. Thus, to understand when and why people provide or withhold feedback we employed a dual strategies theory to investigate the extent to which prestigious people are willing to provide (versus withhold) feedback in a group interaction. Dominance orientation refers to a strategy of gaining power and status through intimidation and coercion while prestige is obtaining this same stature but doing so by demonstrating ability and overall, a gained admiration of the group. In this way those with a greater prestige orientation are more sensitive to maintaining approval of the group thus, we predict that prestigious individuals will withhold more and refrain from providing said candid feedback. In this project we will examine how participants behave in a private and public condition in which subjects assigned as critics will have the opportunity to provide honest critical feedback.

Florida State University

An Analysis of the Relationship between TikTok Screen Time and Intensity of Political Beliefs Amongst Daytona State College Students

Soleil Skrocki

Benjamin Graydon

Due to the increasing influence of TikTok in politics, researchers have been studying how it affects the politics of its users. By using TikTok to share their political beliefs, young people impact both themselves and others (Moffett et al., 2023, p.538). By using a sample from Daytona State College, the researchers investigated the connections between TikTok screen time and the intensity of political beliefs among college students, as well as their political leaning. This study administered a survey where 52 respondents were divided into groups based on their TikTok screen time and political leaning, participants were then asked four questions to determine the strength of their political views. The four questions were formulated from the Pew Research Center Ideological Consistency Scale (2014). The results of the study indicate little connection between TikTok screen time and political leaning. However, respondents with lower screen time tended to have stronger political beliefs, although the difference in strength was not statistically significant. While the results were limited by sample size, this study provides compelling information about the relationship between TikTok and politics at large, indicating a possible pattern of more screen time weakening political beliefs. Future research should focus on political strength more specifically and narrow down screen time groups.

Daytona State College

GPCR Dysfunction in Schizophrenia: Role of Serotonin and Dopamine Receptors

Sona Patel & Darya Shirzad

Dr. Libin Ye

Schizophrenia is a complex illness with diverse neurological symptoms, affecting cognition, perception, and behavior. This disorder is strongly related to G-protein coupled receptor (GPCR) dysfunction, due to dysfunctional limbic systems and brainstem alterations. Key receptors, including serotonin (5-HT) and dopamine (DA), exhibit functional deficits in schizophrenic patients, leading to neurotransmitter imbalances and symptom variability. This review explores how structural and functional insights into GPCR signaling enhance understanding of serotonin and dopamine pathways, and support the development of therapeutic treatments. A literature review was conducted using PubMed, including 21 peer-reviewed articles from the last decade. Keywords included “G protein-coupled receptors,” “GPCRs,” “schizophrenia,” “5-HT receptors schizophrenia,” and “D2 receptor dysfunction.” Recent findings identify 5-HT2A and 5-HT2C receptors as promising targets for newly developed therapeutics. Treatments targeting D2 receptors alone have proven insufficient for most schizophrenic patients. Additionally, 5-HT2B receptors show therapeutic potential. Multifunctional compounds targeting multiple receptors may improve treatment efficacy. Studying the interactions between allosteric sites and GPCRs helps clarify their role in disease development. Targeting specific receptors remains difficult due to the complex nature of GPCRs and their subtypes. Structural insights into GPCR abnormalities can enhance understanding of the disorders neurobiology. Although targeting post-receptor sites may offer relief, the unique signaling transductions of GPCRs complicate drug development. As a result, developing clinically proven treatments remains a challenge. Further research into GPCRs structures and their interactions with ligands is important for creating more effective treatments.

University of South Florida

Parents’ Attitudes Regarding Therapy: Understanding how Parents’ Opinions on Their Adolescents Autism Diagnosis Impacts Their Child’s Developmental Progression

Sophia Alvarez

Yael Dai

Mental Health is an essential part of our well-being and has received an influx of attention over the past several decades. Despite the progression of the mental health movement, there remains a plethora of parental figures that continue to resist adapting to this modernized way of perceiving mental health disorders and therapeutic practices. This reluctance stems from a variety of different reasons, those of which will be addressed throughout this paper including religious influence, emotional defiance, lack of education, and so much more. The extent of parents’ acceptance towards this process could have a detrimental impact on their child, especially if said child is struggling with a mental health disorder like Autism. As a result, this extended literature review was composed in order to showcase the influence a variety of parents have on their specific child’s autism diagnosis and the many ways this could be hurtful to the child’s developmental capabilities in the future. Although

there is still a long way to go, the analyzed studies help parents move one step forward in this journey as they learn more about how their willingness to participate, attitude toward the disorder, general knowledge, and religious beliefs could all be affecting their child's progress. Additionally, parents can use these results to reflect on their contribution towards their child's mental health journey, including working more actively with their child and ensuring they receive the help they need.

Florida International University

Composition and Light: The Lady of Shalott in a Pre-Raphaelite Mirror

Sophia Calderon

Sean King

John William Waterhouse, a major Pre-Raphaelite figure of the late 19th century, developed a naturalistic framework for his pieces while also diverging into his own artistic explorations. Often overlooked in favor of their poetic source material, the series of his sketches and paintings of the Lady of Shalott is a perfect example of artistic reinterpretation as they incorporate personalized elements. All studies of these artworks have focused primarily on their inspiration from the eponymous poem by Alfred, Lord Tennyson. However, the stark distinction between each artwork inspires speculation about their extraordinarily different appearances, especially concerning the intricate detailing of motifs as well as backgrounds and mirrors. Unlike previous analyses, this study expands on our understanding of these artworks in relation to the artist, focusing not only on the original poetic material, but also on the changing compositional and iconographic structures that form new relationships between the artworks themselves. By examining these evolving structures, the artist's creative process and the interconnectedness of his works can undergo further exploration. A new understanding of the artworks can now be read as a single evolving exploration of gender, identity, and symbolic social commentary of the 19th century, rather than a merely painted reflection of a famous poem.

Santa Fe College

Minimal Degradation of Pha Straws in Tampa Bay Summer Conditions

Sophia DiPaola & Maggie Tomaszewski

Amy Siuda

Microplastic pollution is a concern for Tampa Bay. In late 2018, St. Petersburg, Florida implemented a ban on plastic straws, including bioplastic straws made from polylactic acid (PLA), via City Ordinance 365-H. This ordinance aims to safeguard the welfare of St. Petersburg by protecting essential marine ecosystems from plastic waste. Recently, polyhydroxyalkanoate (PHA) straws have entered the market, with claims that they can break down within 58 days in marine environments. To evaluate the potential degradation of PHA straws in Tampa Bay, straws were incubated at 30°C in filtered seawater, retaining the natural bacterial community. Straws were weighed, imaged, and analyzed for degradation biweekly over the course of 70 days. Only minimal degradation was observed. To isolate the impact of light, a separate set of straws were incubated in sterile artificial seawater with half exposed to full light conditions, while the other half were maintained in darkness. Again only minimal degradation was observed in either treatment. This work suggests that PHA straws are unlikely to degrade rapidly in Tampa Bay and may pose a threat to ecosystem health for long time periods. This research can inform local policy regarding the implications of using PHA-based straws.

Eckerd College

Bridging Minds: Attributing Consciousness to AI and Trust Implications

Sophia Sakakibara Capello

Dr. Shawn Davis

This study is an investigation of how cognitive factors influence the attribution of consciousness and trust in generative AI (Artificial Intelligence), specifically ChatGPT. We aim to understand the impact of demographics, Theory of Mind (ToM) levels, mind schemas, anthropomorphism tendencies, and prior experiences with AI, on user perceptions. Participants, recruited from the

University of Central Florida via the SONA system and campus flyers, will complete an online study with a series of surveys measuring their cognitive biases and perceptions. Post-interaction surveys will measure perceived consciousness and trust. Data will be analyzed using regression, ANOVA, and Pearson correlation to identify the cognitive factors influencing these perceptions. This research aims to provide insights into human-AI interaction, informing ethical guidelines and design strategies to mitigate potential negative impacts of anthropomorphism in AI.

University of Central Florida

Cytotoxicity and Toxicological effects related to e-cigarettes use

Sophia Victoria Jerez, Trinidad Argüelles M.S., Ed.D, Claudia Sánchez MSFS & Maria M. Monzon Ph.D.

Maria Monzon-Medina

Interactions between chemicals and living organisms are studied by Toxicology. This science comprehends various effects of substances in the human body and cytotoxicity; cell damage produced by chemical exposure. After being designed as an alternative to cease tobacco consumption, electronic cigarettes (e-cigarettes) have been targeted to a significant bigger audience, including dual users (of tobacco and e-cigarettes), first time smokers (users who have never smoked) and users who aim to reduce tobacco consumption (left combustible cigarettes for e-cigarettes). Effectiveness as a smoking cessation, impact on population, health implications, and other factors are being studied, while most recent findings describe important health issues in vulnerable population and firsthand exposure. The purpose of this study is to comprehend cytotoxicity, and toxicological effects related to e-cigarettes use, through a systematic literature investigation and analysis of previous research findings. Results of this methodology concluded that there are numerous studies showing scientific data evidencing systemic effects and multisystem damage, such as cardiovascular (high blood pressure), respiratory (infections, higher risks of pulmonary disease) and psychological issues (anxiety). Toxic substances found in certain e-cigarettes are responsible for causing cytotoxic damage. Nevertheless, deeper exploration should be carried out to determine the complexity of these substances, short- and long-term results.

Miami Dade College

Blood Pressure Reactivity During Isometric Handgrip Exercise Between Adults With and Without Obesity

Sophia Vizoso

Dr. Joseph Watso

Background: High blood pressure (BP) reactivity during exercise predicts higher cardiovascular disease risk. Individuals with stage 3 obesity (body mass index[BMI] <40 kg/m^2) have higher BP reactivity. However, whether stage 1-2 obesity (BMI 30-40 kg/m^2) is associated with higher BP reactivity is less clear. Therefore, we tested the hypothesis that adults with stage 1-2 obesity would exhibit higher BP reactivity during isometric handgrip exercise compared to those without obesity. Methods: We measured beat-to-beat hemodynamic (photoplethysmography) and heart rate (electrocardiogram) in participants without obesity (BMI <30 kg/m^2) and with stage 1-2 obesity (BMI 30-40 kg/m^2) during a 10-minute baseline and a 2-minute bout of isometric handgrip exercise at 40% of maximal voluntary contraction (MVC). Differences (Δ; handgrip minute two-baseline) were compared using unpaired, two-tailed analyses and ANCOVA (MVC as covariate) and reported as with versus without obesity (mean±SD or median[IQR] for non-normal data [p<0.05 Shapiro-Wilk test]). Results: BMI (n=15, 34±3 vs. n=15, 23±2 kg/m^2, p<0.0001), but not age (22[7] vs. 24[6] years, p=0.11) or resting mean BP (89±7 vs. 87±7 mmHg, p=0.33) differed between groups. During handgrip, Δmean BP (Δ31±9 vs. Δ24±10 mmHg; p=0.04; ANCOVA p=0.05) and Δheart rate (Δ22[19] vs. Δ12[11] bpm; p=0.02 ANCOVA p=0.02) were higher in adults without obesity. ΔCardiac output and Δtotal vascular conductance were not different between groups (p≥0.56; ANCOVA p≥0.45). Conclusion: Contrary to our hypothesis, BP reactivity was higher in participants without versus with obesity during isometric handgrip exercise. These findings suggest that BMI alone may not be associated with BP reactivity during exercise.

Florida State University

Lacquer and Legacy: Opening the Box to Soviet Narratives and Post-Soviet Realities

Sophie Maclayne Works

Dr. Lisa Ryoko Wakamiya

This study investigates the narratives projected onto Russian folk art and how these attitudes reflect the manifestation of these objects in private and public post-soviet spaces. The folk artists of Palekh, Fedoskino, Mstera, and Kholui were originally icon painters. In the decades following the religious censorship of the 1917 revolution, they pivoted to folklore painting to supply Soviet Russia with a needed sense of national identity amidst the revolution's earlier upheaval of cultural values. Ironically, their meticulous and celebrated production of folk art was not intended for use by the proletariat of Soviet Russia and the USSR. The state's policies and priorities of constructing a thriving facade restricted access to these creations, revealing a broader tension between the failure of ideology not reflecting reality and the everyday lives of its citizens. Today, these narratives continue to illustrate themselves in post-soviet realities. This study highlights how national trauma, collective memory, and nostalgia affects Russian folk art's display or displacement in post-soviet homes, businesses, and museums. Framed further by

the polarized political climate surrounding Russia today with the ongoing Russo-Ukrainian War, this study also examines how contemporary public attitudes across generations clash or conjoin with Soviet narratives to affect the perspectives on Russian folk art. As it is a universal tradition to display sentimental, beautiful, or functional items in the home, examining the role of Russian folk art in these spaces reveals how Russian folk art accrues new layers of function—beyond its original intent—reflecting evolving relationships between identity, memory, and material culture.

Florida State University

Sexual and Reproductive Health Access Among Racial/Ethnic Minority College Students

Srithanvi Pasunuri

Dr. Xiaochuan (Sharon) Wang

Sexual and reproductive health (SRH) is a cornerstone of well-being, yet significant disparities in access persist among racial and ethnic minority college students in the United States. These inequities, driven by financial barriers, cultural stigmas, and inadequate campus resources, contribute to higher rates of unintended pregnancies, sexually transmitted infections (STIs), and poor academic and health outcomes. Addressing these challenges is critical to promoting health equity and improving student success. This systematic review synthesizes existing literature to identify barriers to SRH access, explore the influence of cultural, social, and institutional factors, and assess interventions proven effective for this population. Using Andersen's Behavioral Model of Health Services Use as a framework, the review examines peer-reviewed articles and grey literature from databases such as PubMed, PsycINFO, and Scopus. Preliminary findings highlight pervasive disparities, including a lack of culturally competent care, restrictive reproductive health policies, and limited SRH resources, particularly at community colleges. Effective interventions, such as telemedicine and community-based care models, demonstrate the potential for improving SRH outcomes and access for underserved populations. By addressing gaps in knowledge, this study aims to inform policy and campus-level strategies that enhance SRH services, reduce disparities, and foster academic success. The findings emphasize the urgency of expanding culturally competent care and equitable SRH access to empower minority college students during this critical stage of development. Future research will explore long-term impacts on educational attainment and overall well-being, advancing a more inclusive and equitable healthcare landscape.

University of Central Florida

Parental Support with College and Career Guidance in Adolescence

Sriya Grandhi & Roy Chen

Michael Cross

The transition from high school to college or career presents significant stressors for students, particularly those from disadvantaged backgrounds, often leading to indecision and potential failure in achieving post-secondary success. This study focuses on a charter high school in the Tampa Bay region, Brooks DeBartolo Collegiate High School (BDCHS), examining how charter schools can serve as a conduit for enhancing college and career readiness. The action-based research leverages a comprehensive literature review complimented by direct interactions with school officials and students for student readiness enhancement.

Methods in this project include qualitative data collection through stakeholder interviews at BDCHS to identify both challenges and opportunities within the current system. Early results indicate a disconnect between student needs for career-building extracurricular activities and the perceptions of engagement by school staff. This discrepancy suggests cognitive overload among students and a lack of adequate guidance, compounded by resource limitations faced by school counselors.

To address these issues, we propose model that increases parental involvement through an existing structure, the Parent Advisory Council. This model aims to integrate parental experience and networks to provide personalized guidance and opportunities for students, thereby reducing stress related to future insecurities and enhancing the alignment between educational offerings and student interests.

The proposed framework seeks to not only mitigate the immediate stresses associated with post-secondary planning but also to improve overall outcomes in college admissions and career placements for students at BDCHS, setting a precedent for charter schools nationwide to follow.

University of South Florida

The Future of Active Learning: The Efficacy of AI-infused Study Techniques

Stacey Hoffmeister, Mary Morgan & Jacob Gay

Dr. Stephen Blessing (with the help of Dr. Sarah Orban)

Artificial Intelligence (AI) systems, such as large language models (LLMs), have become widely used. Developers design these systems with the ability to engage in conversational dialogue with users. Integrating AI systems such as ChatGPT and Google Gemini into educational settings provides new opportunities for enhancing learning outcomes. However, optimal methods for utilizing AI in conjunction with proven effective active learning techniques have yet to be established in a college environment. Numerous active learning techniques have shown beneficial results for students. Multiple studies have shown that using active learning techniques increases retention, and leads to better application of information (Ambrose, 2010; Prince, 2004). Kosslyn (2023) discusses methods for using LLMs to enhance active learning and engagement outcomes. For this study, we selected three active learning techniques detailed by Kosslyn: deep processing, building associations, and chunking. We hypothesized that students who gained instruction on effective AI usage and active learning techniques would demonstrate better learning outcomes than those in the non-AI group. To determine whether training students on the efficient use of AI to build upon active learning skills produces better learning outcomes, we designed a Canvas course surrounding these methods. As they worked on the course, we gathered data as they completed each module, including how well they learned using the study technique with the AI system. We compared performance not only between the AI and non-AI Canvas groups but also between those two groups and the students who did not take part in learning experimental study skills.

University of Tampa

Fabrication & Characterization of Composite PEG Granular Scaffolds with Aligned Micropatterned Pores

Stephanie Manrique

Dr. Carlos Rinaldi-Ramos

Peripheral nerve injuries significantly impact quality of life and remain challenging to treat due to limitations in existing biomaterials. Hydrogels are particularly promising for tissue engineering because their high water content mimics natural tissues, and their biocompatibility, tunable mechanical properties, and ability to deliver bioactive molecules make them ideal for regenerative applications. This research aims to mimic the structure of hierarchically organized tissue by providing directional cues for cell growth in 3D volumes. Using magnetic templating, a novel micropatterning technique, we sought to develop a patterned biomaterial with tunable physical cues, multi-scale porosity, and bioactive, modifiable properties. Microgels were formulated through batch emulsions, crosslinked under UV light, packed in an ULTRA centrifuge, and incorporated into hydrogel composites at varying concentrations alongside an interstitial matrix to study how hydrogel quantities and packing affect the magnetic particle alignment and cross-linking. Our findings show that microgel concentrations between 40-60% v/v allow for aligned, singly dispersed magnetic particles, while concentrations outside this range result in either improper cross-linking or disrupted alignment. These results highlight the importance of optimizing microgel properties to mimic native tissue organization. This study demonstrates the feasibility of magnetic templating in granular hydrogels and provides foundational insights into designing scaffolds that enhance nerve regeneration. Future work will perform mechanical indentation tests on patterned granular composites to evaluate their mechanical properties and investigate their use in cell culture environments, assessing biocompatibility and effectiveness in supporting cell infiltration and proliferation.

University of Florida

Associations of Physical Activity with Activities of Daily Living, Instrumental Activities of Daily Living, and Cognitive Impairment Among Chinese Older Adults

Stephanie Morera & Hannah Haddick

Yen-Han Lee

China has faced rapid growth of the older adult population since the 21st century. Older adults commonly experience health challenges related to activities of daily living (ADL), instrumental activities of daily living (IADL), and cognitive impairment. This study explored the associations between physical activity (PA) and these outcomes among Chinese older adults. Data from four waves of the Chinese Longitudinal Healthy Longevity Study (CLHLS) were analyzed using multistate survival analysis. The study included adults aged 65 and older. Good ADL and IADL were defined by full scores of 6 and 8, respectively, while cognitive impairment was assessed using the Mini-Mental State Examination

(MMSE, with a score of 30 indicating good cognitive function, 18–24 moderate impairment, and <18 severe impairment). PA status was categorized as: never active, previously active but inactive during the study, newly active during the study, and consistently active. Of the participants, 47.8% were never active, while 19.0% were consistently active. Older adults engaged in PA, including those newly active, had significantly lower risks of deteriorating ADL and IADL (all $p < 0.01$). PA also reduced the likelihood of cognitive decline, both from good to moderate and from good to severe impairment (all $p < 0.01$). Promoting PA is essential to preventing declines in ADL, IADL, and cognitive function among older adults. Public health practitioners should advocate more frequent PA in the older adult population.

University of Central Florida

Modeling the Effect of Tumor Associated Macrophages (TAMs) on Ovarian Cancer Population Dynamics and Acquired Resistance

Steven Robles Blasini

Dr. Meghan C. Ferrall-Fairbanks

Ovarian cancer has the highest death toll out of all the gynecological cancers. 70% of ovarian cancer patients will experience recurrence after the first line of therapies. This recurrence is thought to be due to the inherent resistance in certain tumor populations that resist the common treatment strategies. In recent years, the role of the tumor microenvironment (TME) in cancer progression has been better studied. Increasingly, bioinformatics tools have been able to deconvolute cell type composition from tumor samples to determine the immune cell composition from bulk RNA-sequencing datasets. CIBERSORTx was used to study gene expression profiles from bulk sequencing; M2 macrophages and CD4 resting memory T-cells were highly expressed compared to other immune cell types in ovarian cancer samples. These macrophages are thought to promote resistance and suppress the immune response around the tumor, reducing the effectiveness of therapeutics. This information will contribute to the refinement of a mathematical model of ovarian cancer resistance to include pertinent TME components in addition to the sensitive and resistant cancer cell populations already in the modeling framework. To parameterize the enhanced model, we will use data from a co-culture with a 1:3 ratio of resistant to sensitive cells to evaluate how polarized macrophages can affect the proliferation of resistant cells. We hypothesize that M2 macrophages will facilitate the resistant cells to outcompete the sensitive population. This model can lead to future adaptive therapy schedules that incorporate the immune system's role in driving resistance to reduce the rate of recurrence.

University of Florida

The Relationship Between a Novel Measure of Dating and Sexual Protective Behavioral Strategies (PBS), the Sexual and Negative Dating Inventory (SANDI), and Alcohol Use

Sthefani Paitan & Joliza Maynard

Dr. Robert Dvorak

Objective. Protective behavioral strategies (PBS) are harm reduction strategies that mitigate negative alcohol-related use and consequences for college students. Alcohol use is frequently endorsed by college students and is commonly associated with negative consequences. Alcohol use, alcohol consequences, alcohol PBS, and dating and sexual protective behaviors via the Sexual and Negative Dating Inventory (SANDI) were examined. Three hypotheses were proposed: H1) SANDI would be associated with fewer drinks at follow-up, controlling for baseline alcohol PBS, H2) SANDI would be prospectively associated with fewer alcohol-related consequences at follow-up, and H3) alcohol use would moderate the association between SANDI and consequences. Method. Participants (n=324; 78.1% female, Mage 19.2, SD=2.2, 71.3% white) completed baseline and one-month follow-up surveys. The following measures were included: alcohol PBS (PBSS-20), SANDI, Daily Drinking Questionnaire, and Brief Young Adult Alcohol Consequences Questionnaire. Results. H1) More SANDI at baseline was associated with lower levels of alcohol use at follow-up (IRR=0.67, p=.034; Cragg-Uhler R2=.03), only when alcohol PBS were not controlled. H2) SANDI at baseline was associated with fewer alcohol-related consequences at follow-up (IRR=0.74, p=.035, Cragg-Uhler R2=.18), which was moderated by alcohol use. Finally, H3) SANDI was prospectively associated with fewer alcohol-related consequences at low levels of follow-up alcohol use (IRR=0.60, p=.017). Conclusions. Follow-up scores on SANDI were associated with more protective effects for alcohol consequences. However, these protective effects were removed among those who drink more on a typical week. Overall, the SANDI was primarily effective for average and low levels of alcohol use.

University of Central Florida

The Intersection of ASD and Mental Health: A Focus on College Students

Sudeepta Matha

Kimberley Gryglewicz, Ph.D., MSW

Rising prevalence rates of autism spectrum disorder (ASD), changes in diagnostic criteria, and increased public awareness have all contributed to the growing population of college students with ASD. However, many individuals - commonly referred to as the "lost generation" - go undiagnosed, due to being misunderstood and dismissed by mental health professionals. As a result, these individuals are not given the proper support and interventions required for a successful transition into adulthood, and often face heightened social isolation, academic challenges, mental health challenges compared to their neurotypical peers. A combination of these factors can lead to increased suicidal ideation (SI) and non-suicidal self-injury (NSSI) and thereby evaluating their overall suicide risk. This study investigates the prevalence of ASD among college students in Florida, and its association with mental health issues, SI, and NSSI. By examining formally diagnosed and self-identified students with ASD, this research project aims to identify unique risk factors and coping mechanisms within this population. Participants will complete an online survey assessing self-reported ASD characteristics, mental health symptoms, and NSSI behaviors. Data analysis will involve descriptive statistics, t-tests to compare formally diagnosed and self-identified groups, and correlational tests to analyze relationships between ASD traits and NSSI domains. Notably, this study applies the Research Domain Criteria's (RDoC) framework, offering a comprehensive approach to understanding the intersection between ASD and NSSI behaviors.

University of Central Florida

Ethical Implications of Artificial Intelligence (AI) in Surgical Robotics

Sudhiksha Maramraju & Aditi Ragothaman

Dr. Victor Bowers

The integration of artificial intelligence (AI) in surgical robotics represents a transformative advancement in modern medicine, which holds promise for increased accuracy, decreased surgical errors, and quicker recovery periods. However, there are ethical issues with its implementation, especially with regard to informed consent, patient confidence, and fair access to care. These issues are examined in this literature review from the perspectives of beneficence, justice, autonomy, and non-maleficence. The study looks at how AI's "black-box" nature makes surgical decision-making less transparent and accountable, which could jeopardize informed consent and trust. Peer-reviewed research and industry publications discussing the moral, technological, and societal implications of AI-powered surgical devices are analyzed as part of the methodology. Important conclusions show that although AI-assisted surgery improves results in controlled environments, access disparities brought on by socioeconomic variables and skewed datasets run the risk of making health disparities worse. These results highlight the necessity of diverse and representative training datasets, explainable AI systems, and policies that promote fair access to surgical robotics. To guarantee that AI's advantages are experienced by all, future research should focus on creating transparency tools, increasing access to healthcare in rural areas, and improving regulatory frameworks. By supporting trust, equity, and patient-centered care in the rapidly changing field of surgical robots, this study supports further attempts to match technology advancements with moral standards.

University of South Florida

Integrating Technology and Empathy in Postpartum Depression Education

Sujehnna Walker

Dr. Mark Kamrath

Traditional ideals of motherhood emphasize joy, selflessness, and resilience. There is little room in these expectations for addressing feelings of sadness, inadequacy, frustration, or anxiety. As a result, mothers may feel pressure to hide their feelings or even be able to recognize them as normal. When addressing postpartum depression (PPD), considering social and cultural factors in the way this condition is perceived and experienced is essential to understanding how to give support. The stigma around PPD is deeply rooted in those social and cultural factors, which vary across regions and communities, but share a common theme of shame, guilt, and isolation. By understanding the social and cultural contexts, we can better address the stigma surrounding PPD when working towards fostering effective and supportive environments. The proposed project focuses on developing a comprehensive digital platform to support individuals affected by postpartum depression. The initiative seeks to tackle postpartum depression by addressing the social and cultural stigmas associated with motherhood and mental health. Through an open-source website, ppdpath.org, the project will centralize resources and provide

interactive features such as demographic data visualization, spatial mapping of treatment facilities, and anonymous chat options for virtual support. It emphasizes culturally sensitive education, tackling stigmas around PPD with multilingual content, scientific studies, and testimonials. A multidisciplinary team will ensure the platform's success, incorporating expertise in web development, GIS, health communication, and data security. The project aligns with digital humanities principles, using technology to improve societal well-being through accessible mental health education and community engagement.

University of Central Florida

Green Generation Gap

Sumaia Naga

Dr. Martha Hubertz

In light of an age where environmental decline is a consistent threat, this research proposal analyzes daily sustainable practices of college students on a high, moderate, and low adoption scale, to offer insight into effective practices and age-related barriers to sustainability. The research uses a quantitative analysis of survey data collected from a sample of UCF students, aged 18-52. This data proposes how best to implement effective sustainability practices in college-aged students. The correlations were calculated using Pearson's correlation coefficient (r) with a statistical significance level of $p < 0.05$. A one-way ANOVA revealed significant differences in sustainability engagement across age groups ($F(3,922) = 8.94$, $p < .001$, $2 = .028$), with post-hoc Tukey tests indicating the 18-20 age group ($M = 3.42$, $SD = 0.86$) scored significantly higher than older cohorts ($M = 3.13$, $SD = 0.92$). Implications of this study suggest that educational interventions that focus on age-appropriate motivators such as community engagements for mature students (21+) and technology-based engagement for young students (18-19) may be utilized. Results revealed significant age-related differences in sustainability attitudes and behaviors among college students. The data suggests that students are more likely to adopt sustainable behavior if they require minimal lifestyle changes, offer an immediate personal benefit, are convenient to implement, and don't require significant financial investment. There is potential for more challenging sustainability practices to grow with targeted education and infrastructure development.

University of Central Florida

Beyond The Pink Tax: An Exploration of Personal Finance & The Economy

Sydnee Scully

Jason Fitzgerald

Despite decades of progress in gender equality, women continue to earn only $0.84 for every dollar earned by men, for comparable work. Adding to this inequity is the pink tax—the additional costs for everyday products and services marketed to women. While these seemingly minor costs may appear insignificant in isolation, they compound over a lifetime, contributing to various financial outcomes. These disparities limit women's ability to engage in vital personal finance practices such as saving, investing, and effectively managing their expenses. As a result, women often face reduced financial security, less lifetime earnings, and inadequate retirement savings. Consequential financial challenges prevent women from accumulating the capital needed to start businesses. Less women in entrepreneurship limits innovation, job creation, and ultimately affects the broader economy.

This research seeks to uncover the extent of inequities and their impact on women's financial security by analyzing key economic data, stratified by gender, including salary statistics, disposable income levels, retirement savings patterns, etc. In addition to examining women's personal financial metrics, this study will employ data and statistical modeling to explore how these predictors impact different aspects of finance. Quantitative findings will be presented as tables alongside data visualizations. Macroeconomic effects will be reported qualitatively. Highlighting the systemic challenges women face may emphasize a need for policy interventions to address disparities and promote economic resilience.

South Florida State College

Determination of Morphological Differences Between Bottlenose Dolphins Based on Sex and Age

Sydney Haas

Dr. Heidi Harley

The Sarasota Dolphin Research Program has been studying the resident bottlenose dolphins in the Sarasota Bay for over 50 years. One relationship that is important to look at is how dolphins interact with their main natural predator, sharks. This study is the first part of a longer study that will be studying shark bite scars on dolphins to determine the species of shark that is biting them

the most. This project worked to determine if there are morphological differences between different demographics of dolphins. Based on the level of consistency, this may be used as a benchmark for measuring interdental measurements on shark bite scars on Sarasota Bay dolphins. One way these dolphins have been studied is through health assessments. During these, various measurements are taken of the dolphin. Statistical tests were run on these measurements to see if consistency existed between different areas on dolphins between gender and age. Based on preliminary results, there does not appear to be statistically significant differences between male and female morphology. However, there appears to be some differences in morphology between dolphins of different ages. The next part of this study will investigate how the consistency of these measurements can be used to measure the interdental measurements of shark bite scars left on dolphins. The interdental measurements of the sharks is unique according to the species. Therefore, if interdental measurements of shark bite scars can be measured, then it can be determined which species of shark is biting dolphins the most.

New College of Florida

Investigating Biomarkers for Neural Plasticity Using Non-Invasive Brain Recording

Syed Yahya Raza

Dr. Mohsen Rakhshan

Neural plasticity is the brain's ability to adapt and reorganize neural connections in response to learning, environmental changes, or injury. Importantly, rehabilitation from injuries or neurological disorders also relies on this ability. Neural plasticity can also be crucial for closed-loop bidirectional brain-machine interfaces (BMIs). In these systems, the brain learns to use the interface based on its response to the user's intentions. Despite advances in BMIs, they often assume brain activity is time-invariant or dismiss variations as noise. Typically, researchers re-train decoders to maintain accuracy without studying these changes as meaningful adaptations of the brain to the interface. Developing BMIs that minimize the noise effects but also recognize and predict user learning patterns can be transformative. Machine learning algorithms within these interfaces could adapt to individual learning styles, making interactions more natural and synergic. Although neural plasticity's role is extensively studied, there is a lack of non-invasive biomarkers (except the changes in behavior) to measure it. Importantly, electroencephalography (EEG) can provide real-time, non-invasive insights into brain activity with high temporal resolution. Therefore, it can be promising in investigating dynamic neural changes due to neural plasticity. Therefore, my research aims are to:

1. Examine EEG signals to identify markers linked to neural plasticity, including shifts in frequency components of brain activity or temporal shifts in event-related potentials (ERPs).

2. Track changes in neural activity over time using EEG in response to experiments involving motor learning activities or reward-based learning tasks.

University of Central Florida

Method Development for the Qualitative Analysis of Biochars

Sylvia Long

Dr. Amy McKenna

Biochars pose a promising solution to several environmental issues relating to human food and water systems. Specifically, biochars may be able to sorb per- and polyfluoroalkyl substances (PFAS) and limit the contamination of groundwater by these 'persistent chemicals'. As biochar is created by pyrolyzing agricultural waste, there exists a wide compositional variety of biochars. Aspects such as biochar porosity and chemical composition may affect how well they sorb PFAS. Thus, it is important that we determine the chemical structure and composition of various biochars to better understand their function in the environment. This project focuses on method development for the chemical analysis of biochars. We performed several Soxhlet extractions and extrography to prepare and fractionate biochar samples. The next project steps are to use nuclear magnetic resonance (NMR) and Fourier-transform ion cyclotron resonance mass spectrometry (FT-ICR MS) to analyze biochar samples. We hope to relate biochar chemical analyses to biochar feedstock type and pyrolysis temperature. This method development is an essential part of a larger project with aims to limit PFAS contamination in groundwater and reduce PFAS fate/transport in soils, which could have lasting benefits in preserving human and ecosystem health. A portion of this work was performed at the National High Magnetic Field Laboratory, which is supported by the National Science Foundation Division of Materials Research and Division of Chemistry through DMR-2128556 and the State of Florida.

Florida State University

Exploring the Relationship between Exposure to Disinformation on Climate Change Posted on Instagram and DSC Students' Outlook on the Future

T. Corey Bickley & Aidan T. Hale

Dr. Jessica Kester, Ph.D.

How disinformation can affect behavior in individuals is under studied. Instagram, due to inadequate factchecking systems and the characteristics of the platform, has been found to be an environment where its users are particularly vulnerable to disinformation, (Bringula et al., 2021, Chadwick et al., 2022). Previous research has also explored the effects of disinformation created to undermine the scientific consensus on anthropogenic climate change, (Hassan et al, 2023, Treen et al, 2020). The goal of this study is to explore the relationship between disinformation and the future outlooks of Daytona State College students after being exposed to Instagram posts about climate change. The researchers modified the Openness to the Future Scale, as created by Botella and colleagues (2018), to measure change in outlook immediately after exposure to either disinformation or factual posts. The data collected suggests that those exposed to disinformation have more positive outlooks towards their futures than those presented with factual posts, although the results were not statistically significant. These results challenge our original hypothesis and contradict the cognitive dissonance previous research found when college students were exposed to disinformation (Wolff & Taddicken, 2022). Future research could explore if disinformation could fulfill the role of positive illusions needed to have a high openness to the future (Botella et al., 2018), or if college students have developed resistance to disinformation.

Daytona State College

Enhancing Inflammatory Bowel Disease Treatment with pH-Sensitive Drug-Polymer Complexes and Advanced Electrospray Methods

Takara Keely Edamura O'Brien & Rahela Dolha

Foram Madiyar

Inflammatory bowel disease (IBD) presents a challenge due to persistent inflammation in the gastrointestinal (GI) tract, leading to suboptimal treatments and side effects. This research aims to develop a pH-sensitive drug delivery system targeting inflamed GI tissues to improve therapeutic outcomes. Using electrospray technology, we are creating a drug-polymer complex with Eudragit S100 and L100 polymers, 5-aminosalicylic acid (5-ASA), and select flavonoids. Eudragit polymers allow pH-triggered release: S100 dissolves in the colon at pH < 7, and L100 targets the small intestine at pH < 6. Electrospraying uses high voltage to form fibers, and initial tests confirmed polymer and drug solubility in ethanol, with UV spectroscopy identifying optimal detection wavelengths. Polymer concentration affects fiber morphology, with higher concentrations (<10% w/v) forming smooth, bead-free fibers crucial for consistent drug loading and release. Current experiments optimize bead-free fiber formation by adjusting polymer concentration to achieve proper chain entanglement, assessed using a rheometer for viscosity and flow behavior. After single-needle testing, we will use coaxial and triaxial electrospraying to develop a multi-layered drug delivery system for controlled release at different pH levels in the GI tract. The system will be characterized using techniques like Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy (for chemical composition), Scanning Electron Microscopy (for surface structure), and Transmission Electron Microscopy (for internal morphology). Simulated GI fluid studies will confirm its stability and pH-triggered release, while antioxidant assays will evaluate the bioactivity of encapsulated flavonoids. These steps will validate the system's potential as an IBD therapy.

Embry-Riddle Aeronautical University

Designing Small-Peptide Inhibitors Targeting the N-Terminus and Central Hydrophobic Core of Aß40

Tatiana McFarlane

Dr. Deguo Du

Alzheimer's disease (AD) is the leading cause of age-related dementia, affecting approximately 50 million people globally. Central to AD pathology is the amyloid cascade hypothesis, which highlights the accumulation of amyloid-ß (Aß) peptides as a hallmark of the disease. Aß peptides are generated by the cleavage of amyloid precursor protein (APP) through ß- and γ-secretase complexes. While low concentrations of Aß are relatively non-toxic, higher levels form neurotoxic oligomers and fibrils that disrupt synaptic function, trigger neuroinflammation, and damage neurons. Fibrils further accelerate neurodegeneration.

Aß aggregation relies on specific structural motifs, particularly its central hydrophobic core and interactions with C-terminal residues, forming ß-sheet-rich structures. Aß toxicity stems from inflammatory responses and membrane damage, disrupting neuronal signaling. Aggregates

can create pores or ion channels in neuronal membranes, leading to cellular leakage and ionic imbalance. The hydrophobic core and the flexible, charge-rich N-terminal region play crucial roles in these processes. Recent studies underscore the importance of the N-terminal region in aggregation and membrane interactions, identifying it as a critical therapeutic target.

Our research focuses on developing small-peptide inhibitors targeting both the N-terminal region and the central hydrophobic motif of Aß. By addressing these areas, we aim to inhibit aggregation, mitigate neurotoxicity, and prevent membrane disruption, offering a potential pathway to combat AD.

Florida Atlantic University

Using Environmental DNA (eDNA) to Understand the Biological Diversity of Soil Microbiomes in South-Central Florida

Tatiana Guerra

Dr. Tammy Laberge

Environmental DNA (eDNA) refers to genetic material shed by organisms into their environment, such as soil, water, and air. This method helps monitor species distributions and biodiversity by detecting species in a habitat. Our study applies eDNA analysis to identify bacterial diversity in soil samples from the Archbold Biological Station's Buck Island Ranch, focusing on two land-use types: improved and semi-native ecosystems. The semi-native ecosystem contains native and non-native species introduced through human activities, while the improved system is managed for agricultural purposes. Soil samples were collected, stored at -20˚C, and analyzed to extract DNA. Suitable samples were sequenced to identify 16S rRNA genes, and metabarcoding was performed using the DNA Subway Purple Line. The resulting data will reveal bacterial diversity and habitat composition differences between habitats. We hypothesize that semi-native soils will exhibit lower bacterial abundance due to human disturbances compared to improved soils. Understanding bacterial diversity and community dynamics in these systems is crucial for advancing agricultural practices and ecological conservation. Identifying beneficial bacteria for plant growth could lead to biofertilizer development, improving soil health and productivity. Additionally, insights from comparing these ecosystems may guide land-use planning and landscape management. Our findings could advance research on microbial ecology, plant-microbe interactions, and ecosystem dynamics in south-central Florida, providing valuable tools for sustainable agriculture and conservation.

Miami Dade College

Exploring Dental health and perceptions of holistic dentistry among community college students.

Tatianni Pinkston

Dr. Joseph McNeil

Holistic healthcare is the approach of treating patients entirely rather than focusing on symptoms or existing diseases. In dentistry holistic providers offer proper education in addition to biocompatible materials that harmonize with the body's natural composition. Consumers and providers have become more cautious of the things we put into our bodies, and holistic dentistry introduces patients to healthier alternatives opposed to traditional dental treatments. As dentistry continues to grow and evolve the principles of holistic care have become more popular catching the attention of many consumers, arguably becoming the next generation of dentistry. This project aims to explore the dental health practices and knowledge of holistic dentistry in a population of community college students. The study will analyze how students prioritize oral health, their views on traditional vs. holistic dental approaches, and factors influencing their perceptions. This observational study will be performed through a survey given to students throughout campus, said survey will include questions pertaining to students major, race, and gender all the while documenting the amount of knowledge students possess concerning holistic dentistry and the role holistic care plays in the wellness of patients globally. Proper education of oral care and disease prevention is not only a nation wide necessity it is a world wide necessity, holistic dentistry challenges the beliefs of traditional dentistry in the attempt to improve healthcare for the betterment of humanity.

Tallahassee State College

How an Occupational Exoskeleton Affects Users' Comfort and Perceived Exertion

Tatyana Balashova & Satabdee Purkayastha

Georgia T. Chao

Occupational exoskeletons are wearable devices designed to physically support workers' bodies while they perform strenuous manual tasks. The purpose of these exoskeletons is to help reduce

the prevalence of musculoskeletal disorders in physically demanding occupations. While previous research has found support for exoskeletons' ability to reduce muscle strain, insight into user experience remains limited due to methodological weaknesses such as small (N < 20) sample sizes and insufficiently powered statistical analyses.

This within-subjects lab study (N = 130) explored how a passive back-support exoskeleton affected users' physical exertion and comfort across eight manual tasks, four of which the exoskeleton was expected to support. Results revealed that participants felt the exoskeleton significantly decreased exertion for the four supported tasks. Exertion was not significantly affected in the remaining four tasks. Participants also reported that the exoskeleton significantly increased comfort in two of the supported tasks. Comfort significantly decreased in the four unsupported tasks; however, the comfort ratings were still positive (above 3 on a 5-point Likert scale) even with the decrease.

These findings are encouraging, as they demonstrate that the reduced muscle strain provided by the exoskeleton is reflected in lower perceived exertion ratings. However, there remains opportunities for improvement in enhancing the wearing comfort of occupational exoskeletons.

University of South Florida

What Chemical Cues Do Larval King Crabs Use to Find a Home?

Taylor Alexis Queen

Philip Gravinese

Since the 1970's coral reefs have declined in Florida due to multiple stressors including bleaching, disease, hurricanes, and cold snaps. As a result, coral communities are now becoming increasingly dominated by macroalgae. Herbivory, or the grazing of macroalgae, is a key process on coral reefs that maintains coral-dominated states by reducing macroalgal cover. The Caribbean king crab consumes macroalgae including species that are chemically defended thus making them a promising coral restoration candidate. While adult king crabs can tolerate the consumption of chemically defended macroalgae, it is unknown if certain chemical cues inhibit or promote king crab larval settlement. In this experiment, king crab larvae were exposed to five different seawater chemical treatment cues that included a: a) control (no cue, ozonated seawater), b) chemically defended algae cue (Dictoyta spp.), c) conspecific adult cue (Mithrax spinosissimus), and d) spiny lobster predator cue (Panulirus argus). Our results show that Caribbean king crab larvae were more likely to metamorphose and settle when exposed to the control and conspecific cues, whereas there was a higher mortality and lower settlement among larvae that experienced predator and algae cue seawater. These results suggest that restoration efforts should avoid outplanting crabs in habitats where Dictoyta algae may be abundant.

Eckerd College

The Universal Mass Function and its Applicability to Organic Molecules

Taylor Butler & Raquel Walton

Dr. Carmit Alexenberg

The ability to predict the yield when synthesizing an organic molecule is a challenging issue in organic chemistry and a major obstacle when planning multi-step organic synthesis. The Universal Mass Function (UMF) states that cosmic objects are in direct relation to each other and suggests that massive objects are much rarer than objects with lower masses. As a result, the following research aims to examine if the UMF theory is applicable to the field of organic chemistry, specifically to the yield prediction. The primary reaction conducted was completed in an aprotic environment. This reduction was performed on several different ketone derivatives with varying molecular masses. Following the UMF theory, our results should indicate a larger percent yield with the compound of the highest molecular weight. Preliminary results from previous semesters did suggest that there were higher percent yields gathered from cyclohexanol, with an average value of 22.19%. Results also showed lower percentage yields with cycloheptanol, 12.27%, and an even lower value of cyclooctanol, 5.25%. Ultimately, additional experiments were conducted this semester with different ketone derivatives to further confirm the initial relationship observed.

Nova Southeastern University

What is the effect of dietary carbohydrate load on postural symptoms in POTS patients?

Taylor Combe

Amy Bohan

Postural orthostatic tachycardia syndrome, also known as POTS, refers to the disorder of the autonomic nervous system. POTS is characterized by excessive increases in heart rate and the lowering of blood pressure in response to a change in posture. This study specifically investigates the effect of dietary carbohydrates on postural

symptoms in POTS patients. Focusing on increase of heart rate, decrease of blood pressure, and lightheadedness. Prior research shows that high carbohydrate intake negatively impacts postural symptoms due to carbohydrates impairing blood circulation due to insulin induced vasoconstriction from a spike in blood sugar levels. Logically this has the ability to worsen POTS symptoms. The hypothesis is that higher carbohydrate intake will exacerbate postural symptoms, including increased heart rate, blood pressure instability, and dizziness.

A randomized controlled trial design was proposed, involving POTS patients aged 18–65 assigned to one of three groups: low, moderate, or high carbohydrate intake. Participants' heart rate, blood pressure, and symptoms of dizziness or fatigue were measured before and after standing. These assessments were conducted across varying carbohydrate intake levels to analyze correlations between diet and symptom severity.

Results from background research, including data from the National Institutes of Health (NIH), indicate that high carbohydrate meals exacerbate POTS symptoms in a significant proportion of patients. This study aims to confirm these findings and provide a clearer understanding of dietary influences on postural orthostatic tachycardia syndrome.

New College of Florida

In the Eyes of the Consumer: Food Label and Safety in America

Taylor Smith

Monica Escaleras

The American food industry encompasses many characteristics that play crucial parts in the economy. However, increasing concerns have arisen regarding the ingredients in packaged foods available in U.S. grocery stores and their safety, due to substantial amounts of toxic additives and preservatives. While some see it as a deadly health problem, others are unaware of the issue. Motivated by this variation, I developed a survey to assess the public's knowledge regarding America's food system. Specifically, the project focuses on comparing male and female responses regarding how often they check food labels when grocery shopping and their perceptions of the safety of American packaged foods. The survey consisted of 16 questions and 152 responses were collected via the Amazon MTurk platform. After further analysis through IBM SPSS software, results revealed significant gender differences indicating that 88.3% of females check ingredient lists when grocery shopping very often or somewhat often, compared to 69.9% of males. This difference is statistically significant at the 1% level. Additionally, 7.7% of females perceive packaged food products in the U.S as somewhat unsafe, while only 1.4% of males share this view. This difference is statistically significant at the 1% level. These findings reveal significant gender-based differences, with females demonstrating greater attention to the American food industry. This research could have important implications for the future, particularly considering the knowledge disparities between females and males on this critical issue.

Florida Atlantic University

Beyond Algorithms: How Artificial Intelligence Could Pose as A Threat to Humanity

Teray Sylvester Bembery

Akeemia Clements

Some experts warn the rapid development of Artificial Intelligence (AI) could potentially threaten humanity if it is not carefully managed. AI has the potential to bring enormous benefits improving our lives in countless ways while it also comes with significant risks such as autonomous weapons and warfare, cyberattacks, job displacement, ethical challenges, and even the potential for misuse in social control and surveillance. The research focuses on how AI could impact humanity through economic, social, political, and security-related factors and with the understanding that while AI holds incredible promise, its rapid advancements also introduce new dangers. If left unchecked, AI could lead to a future where machines take over tasks and decisions traditionally performed by humans. This research uses the Qualitative Research Methodology along with the Agenda Setting Theory to examine how AI has evolved from a niche concept into a global phenomenon. The key concern with AI is how the media and culture often glamorize AI's rapid progress, encouraging widespread adoption without emphasizing the need for strong ethical frameworks or safety measures. Preliminary findings reveal that the way we approach AI development and integration into society will determine whether it becomes a tool for good or a serious threat. By prioritizing ethical considerations and creating safeguards, the future of AI will depend on the management of its growth and ensure that its benefits are shared fairly without compromising humanity's safety and well-being.

Bethune-Cookman University

Local Electric Fields Dictate ReactivityTrends in a-Ketoglutarate Dependent Non-Heme Iron Enzymes

Terence S Oscar-Okpala

Dr. Heather Kulik

Enzymes are versatile non-toxic biodegradable catalysts that can be tuned to perform non-native reactivities. α-ketoglutarate dependent non-heme iron enzymes (αKG-NHIEs) are of particular interest due to their ability to activate inert C–H bonds in a diverse range of accessible substrates that are key industrial products such as the antibiotic, vancomycin, which is synthesized by the VioC. Additionally, αKG-NHIEs are characterized by a highly conserved coordination environment defined by a 2His-1Asp/Glu facial triad. However, the molecular mechanism by which substrate specificity is dictated in αKG-NHIEs is poorly understood. One mechanism that has been proposed to guide reactivity is local electric fields. In this work, we performed electric field calculations across all crystallographic αKG-NHIE structures in the Protein Data Bank that contained both a substrate and co-factor. We found strong negative local electric fields to be very specific to the target C–H bond. We also found the trends to be consistent across all reaction types exhibited within the subset of αKG-NHIEs. Additionally, we tested two different functionals and found the electric fields to be insensitive. Lastly, we tested if the electric field trends were different in the unreactive αKG-state compared to the reactive succinate-oxo state and found the electric fields to be consistent. Our results suggest that electric fields of αKG-NHIEs may play a vital role in the activation of inert C–H bonds and could be tuned for selectively functionalizing non-native C–H bonds.

Bethune-Cookman University

Resistance of Thin Film and Spherical Shell: A Two-Node Approach

Thach Nguyen

Van-Duy Nguyen

This study derives theoretical expressions for the electrical resistance of thin films with distinct geometries—specifically, planar sheets and spherical shells—measured between two electrical nodes, as opposed to the conventional four-node van der Pauw method. The traditional four-node approach neglects the geometry of the nodes; however, this research addresses impact of node shape in two-node configurations. Initially, we determine the resistance of a planar thin sheet using the method of images, assuming specific boundary conditions for the electrical nodes. Subsequently, we extend the analysis to spherical shells by employing stereographic projection to conformally map the spherical geometry onto an infinite planar sheet, utilizing the established planar results. This framework not only enhances the theoretical understanding of resistance measurements in spherical shells but also mentions common misconceptions among students regarding the resistance of thin sheet using two electrical nodes. Furthermore, the findings have potential applications in analyzing the electrical properties of the shell component in core–shell nanoparticles, which are prevalent in condensed matter physics.

University of South Florida

Isothermal Viral RNA Amplification and Detection with an Electrochemical Microfluidic System

Thais Ortiz Rodriguez

Dr. Karin Y. Chumbimuni Torres

Influenza viruses, and coronaviruses, are a significant public health concern, making rapid and precise detection of their RNA genomes essential. Detecting RNA directly from viral samples is challenging due to its low abundance, requiring amplification to generate detectable levels. Conventional methods like reverse transcriptase polymerase chain reaction (RT-PCR) rely on thermocycling (repeated heating and cooling cycles) to amplify nucleic acids, but this equipment can be expensive and less accessible in resource-limited settings. This study focuses on the application of Nucleic Acid Sequence-Based Amplification (NASBA), an isothermal amplification technique. This method simplifies the amplification process by eliminating the need for temperature cycling regime, reducing cost and complexity. Current results have shown that Influenza A RNA can be successfully amplified at a constant 37°C, demonstrating the viability of applying NASBA for RNA amplification under these mild conditions. We aim to integrate this amplification technique with an electrochemical biosensor (E-biosensor) in a single microfluidic system in order to propose a device suitable for resource-limited settings. The E-Biosensor consists of a DNA capture probe containing a redox marker. This probe will be immobilized in a gold screen-printed electrode, once the RNA target is present, they will form a duplex complex. Upon the formation of the duplex complex, the redox marker would be pushed away from the electrode surface, creating a variation in

current which can be monitored by square wave voltammetry in real time.

University of Central Florida

Antibiotic Research Communication Through Video

Theodore Fenske

Dr. Ann Williams

The rise of social media has created new methods for information to be shared in educational settings and with the public. Research has shown that video is an effective, supplemental tool used to relay knowledge in a variety of disciplines. Additionally, adding elements such as relevant local connection has been shown to increase interest and engagement with science related videos. A short educational video based on a local and relevant research project was created with an intended audience of non-scientists. The video highlights a genetic basis for identifying antibiotic resistant bacteria found in shark mouths in Tampa Bay. University of Tampa students enrolled in microbiology and intro psychology courses were selected for the study to evaluate if students with varying background knowledge retain the microbiology content differently after watching the video. The study had students complete a set of base knowledge questions, view the video, and provide feedback on the video before answering the same base knowledge questions. The questions were designed to evaluate participants' existing knowledge and knowledge gained after watching the video. The research data collection is ongoing and is expected to show an increase in knowledge related to antibiotic resistance bacteria after watching the video.

University of Tampa

Investigation of Fe(otf)3 as a Photocatalyst

Thomas Brumback

Dr. Bryan Kudisch

Photocatalysts are rapidly rising stars of the chemistry world. As it stands photocatalysts are used in hydrocarbon production, water purification, air purification, and drug delivery. However, one of the main difficulties in broadening the applications of photocatalysts is the relative rarity of the metals currently being used as the centers of these photocatalysts. Currently, many photocatalysts are produced using fifth and sixth-row transition metals as well as other rare earth metals. The costs in both refining and mining these metals are immense when compared to their fourth-row counterparts. With that in mind, we've begun research on the possibility of using iron as a photocatalyst. Recently it was discovered that iron (III) triflate, when in solution with varying nitrile complexes undergoes a ligand exchange, replacing the nitrile ligands with nitriles. These iron nitrile complexes demonstrate LMCT (ligand-to-metal charge transfer) and have distinct light-absorbing characteristics. What presents the possibility for this iron nitrile complex being the base of a photocatalyst is it also undergoes photolysis when irradiated with light at its absorbance peak. It is currently theorized that this photolysis results in a bond homolysis of one of the iron nitrile bonds resulting in an iron (II) nitrile complex and a nitrile radical. Should this radical exist, this presents a new opportunity for an iron photocatalyst.

Florida State University

Laboratory Investigation of Laser Propagation Decay in Scattering Media

Thomas Deyo

Dr. Robert Peale

We are testing an instrument to determine lunar-lander plume particle size distribution from laser propagation decay based on images of laser light scattering. Interpretation of laboratory experiments is simplest if the particle distributions are uniform. Aerosols from a fog machine are a convenient method of creating a light scattering medium. To achieve uniform particle concentration, we confine the fog to a pipe with a window for optical access. The laser enters the pipe from one end via a window, and the fog enters the other end via an opening in a flange. We find that the distribution becomes uniform after a few seconds, allowing us to collect laser-propagation images of free form artifacts caused by inhomogeneity. Then we are able to correct the resulting decay curves for repeatable system artifacts, such as foreshortening, perspective, angle dependence of scattering, polarization effects, and Frensel reflection from intervening windows.

University of Central Florida

Using Drawings to Compare Groupmates' Experiences in an Introductory Physics Lab

Tiffany Snow & Charlotte Dries

Dr. W. Brian Lane

Instructional labs are an important component of undergraduate STEM education. With instructional labs taking up a significant place in the first year of undergraduate study, they impact student

persistence and STEM identity. These labs not only develop students' conceptual learning, but they also enculturate students into STEM as a community-oriented profession based on cooperative work around shared resources. An instructional lab can be thought of as a Community of Practice (COP), defined as a group of members pursuing a common set of goals by using conventional practices. Our group's prior work has demonstrated that students can develop different perspectives of a COP, which we describe as a mental model of the Community of Practice, or COP model. A student's COP model includes the members of the COP and the institutional structures relevant to the COP, the student's understanding of the COP's goals and practices, and the student's sense of membership within the COP. We use a qualitative drawing-based survey in which students express their COP model of an instructional lab to study perceptions of Introductory Physics for Life Sciences. Here, we present the drawings created by three lab partners who worked in the same group. We organize the drawings' elements using a Venn diagram to represent which elements their drawings hold in common, and which their drawings differ on. We use this data to consider the question, "To what degree do students with a shared lab experience draw similar representations?"

University of North Florida

Selenocysteine, the Forgotten 21st Amino Acid, and its U-shaped Effects on Cancer Development

Ting Chao & Sandra Mampilly

Jiang Chang

Selenium is an essential trace element that is incorporated into selenocysteine, the "21st" amino acid uniquely encoded by UGA. Its chemical structure resembles that of cysteine, except for the selenium atom in place of the sulfur atom. Selenocysteine plays a critical role in the catalytic function of selenoproteins - enzymes that are essential for many biological processes, including antioxidant defense. Studies have shown a subset of cancer cells enhanced their survival by promoting selenium uptake and selenoprotein biosynthesis. Upregulation of select selenoprotein production, such as GPX4 and TXNRD1, promotes protection of cancer cells against various processes, such as ferroptosis and oxidative stress, and chemoresistance. Thus, selenium detoxification is required for cancer cell survival. The complex association between selenium concentrations and carcinogenesis is characterized as U-shaped, with minimum adverse health effects occurring at selenium intakes of 110.8 to 124.4 µg/day. Individuals with Se imbalance, either deficient or excess levels, at an increased risk of developing cancer, including gastrointestinal, breast, and lung alongside other adverse health effects, such as increased mortality, Keshan disease, Kashin-Beck disease, and selenosis. Moreover, different individuals have varied levels of selenium uptake and resistance. It is likely that only specific subpopulations may benefit from selenium supplementation; therefore, consideration of baseline selenium status of the patients is important to determine the activity of selenium in cancer prevention. In this project, we investigated the unique biosynthesis and function of Selenocysteine in the human body and its U-shaped impacts on cancer formation and development.

University of South Florida

Basigin Expression in Adolescent Mouse Neural Retinas Is Not Affected by the Stress Hormone Cortisol

Tireign Lindsay

Judith D. Ochrietor

The Basigin gene produces two variants essential for vision: Basigin variant-1 (v1), found in rod and cone photoreceptor neurons, and Basigin variant-2 (v2), expressed by Muller glial cells and the Retinal Pigmented Epithelium. Both variants facilitate the transfer of metabolic substrates from Muller cells to photoreceptor neurons. Research by the Ochrietor laboratory has shown that inflammation influences Basigin expression; young animals (neonates and adolescents) exhibit similar or increased levels of Basigin products in response to inflammation, while adult animals show a significant decrease, suggesting potential vision issues linked to chronic inflammation. Given that stress often accompanies inflammation, this study aimed to investigate the impact of the stress hormone cortisol on Basigin expression in the neural retina. One-month-old mice were treated with cortisol (10 mg/mL) or phosphate-buffered saline (PBS) for either 3 hours (acute exposure) or 24 hours (chronic exposure). Total RNA was extracted for q-RT-PCR analysis of Basigin v1 and v2, normalizing expression with 18s rRNA. Results indicated no significant differences in Basigin v1 expression between PBS and cortisol treatments at both time points, although v1 expression was higher at 3 hours compared to 24 hours. For Basigin v2, no significant differences were detected at either time point. Overall, the findings

suggest that cortisol does not affect Basigin-related metabolism in the neural retina of adolescent mice.

University of North Florida

Exploring Neuroevolution: Can Evolved Neural Networks Detect Cyberattacks?

Tyler Donay & Regan Bossie

Dr. M. Ilhan Akbas

As cyberspace continues to evolve, so do the threats that challenge network security, necessitating the advancement of intrusion detection systems (IDSs). A valuable solution to intrusion defense requires a system that can learn quickly and adapt to new knowledge and inputs. Many anomaly-based intrusion detection systems (AIDSs) rely on traditional machine learning techniques such as clustering and decision trees to create a learning behavior. This research explores a novel approach to enhancing detection capabilities by evolving a neural network architecture using a neuroevolutionary algorithm. Building on previous work that successfully applied the NeuroEvolution of Augmenting Topologies (NEAT) algorithm to intrusion detection, this study investigates the potential of Hypercube-based NEAT (HyperNEAT), an immediate successor to NEAT, in intrusion detection for network traffic. HyperNEAT evolves Compositional Pattern Producing Networks (CPPNs) that encode large-scale neural network connectivity patterns. Its ability to exploit geometric relationships between nodes allows for the automatic discovery of network structure and diminishes the need for manual design, enabling the emergence of innovative solutions. Utilizing the NSL-KDD dataset for network data alongside 3 distinct fitness algorithms, this project will analyze the efficacy of the HyperNEAT algorithm in an intrusion detection scenario. The findings aim to quantify whether HyperNEAT offers an improvement in detecting anomalies compared to traditional methods.

Embry-Riddle Aeronautical University

The Impact of Adverse Childhood Experiences on Binge Eating in College Students

Tyler Favier

Lindsey Rodriguez

Adverse childhood experiences (ACEs) are potentially traumatic events occurring during childhood, associated with myriad health risk behaviors (e.g., alcoholism, drug abuse, physical inactivity). Binge eating behaviors are characterized by consuming large quantities of food in a short period of time, paired with feelings of distress and loss of control. Previous research has examined the relationship between ACEs and Binge Eating Disorder (BED) in clinical populations. However, there is a distinct lack of research in non-clinical populations, limiting generalizability and highlighting a need for prevention-focused research. The present study aimed to investigate the relationship between ACEs and binge eating in college students, and examined potential moderating and mediating variables (i.e., socioeconomic status, loneliness, academic importance, and drinking frequency). Undergraduate students completed a Qualtrics survey that examined their self-reported ACEs and binge eating behaviors. Measures employed included demographic questions, the Adverse Childhood Experiences Questionnaire, the Binge Eating Scale, the Three-Item Loneliness Scale, and the Daily Drinking Questionnaire. We hypothesize that there will be a significant positive correlation between the frequency of ACEs and binge eating behaviors. Furthermore, we hypothesize that this relationship will be moderated by childhood income and loneliness, and that it will be mediated by students' academic importance and frequency of alcohol consumption. Results may indicate novel insights into this understudied relationship and elucidate targets for binge eating prevention strategies across U.S. college campuses.

University of Florida

Insights on AApeptides as they relate to Inhibiting the p300 CH1 domain

Tyler JT Lambert

Jianfeng Cai, Preeminent and Distinguished University Professor, Chemistry Dept.

The HIF-1 pathway helps sustain cancerous tumors by preventing tumor cells from becoming necrotic. The histone acetyltransferase p300 protein is a vital coactivator used in the HIF-1 (hypoxia inducible factor) pathway by binding to subunit HIF-1a. Within our lab we aim to use novel AApeptides as a means of competitively inhibiting the p300 coactivator from binding to the HIF-1a subunit. In order to do this we are specifically studying the protein protein interactions of the CH1 (cysteine/histidine rich-1) domain of the p300 protein as it binds to the C-terminal transactivation domain of the HIF-1a subunit. The p300 CH1 domain is purified through detergent-solubilization followed by incubation with Ni-NTA resin. The supernatant is then purified via IMAC purification using Ni-NTA resin and an imidazole wash. Reverse IMAC is thereafter used to remove the His tag from p300 CH1 domain.

The concentrated protein is then analyzed in SDS PAGE. In the future we hope to find AApeptides that can competitively inhibit the p300 proteins with a strong binding affinity. With promising results, this line of research is a testament for the myriad of practical applications that can come from AApeptides and peptidomimetics in general. On top of this, this line of research could also provide a new method to fight cancer.

University of South Florida

Of Course She's A Cynic: An Exploration of Agency and Cynicism in The Women of Lavinia by Ursula Le Guin

Tyra DiMatteo

Farrah Cato

For my project, I evaluate the notion of cynicism and its implications for women's agency in Ursula Le Guin's novel Lavinia. The goal is to find the correlation of cynicism to the implicit biases created by the patriarchy within the characters, and demonstrate how Le Guin's use of time models this correlation after the modern world. Lavinia is a feminist retelling of Virgil's epic, and unfinished poem, The Aeneid. Le Guin establishes a meta-fiction universe by creating Virgil as a character in the novel. Lavinia becomes aware of herself as a character within his story, while also remaining an agent of her life, without being aware of herself in Le Guin's story. In a conversation with Virgil, he introduces the concept of cynicism to Lavinia, stating "I can never get used to the fact, though I know it, that women are born cynics" (Le Guin 54). The play of time, and the choice to have Virgil introduce cynicism raises the question of who Le Guin is targeting when discussing cynicism. Is the choice to include Virgil in a modern retelling, Le Guin's way of addressing a feminist issue that crosses time and place? Through the analysis of scholarly sources, my research aims to answer this question in an attempt to understand the women's agency in the novel and interpret the parallels to the modern world.

University of Central Florida

Generative AI Policy Use in U.S. Master's in Health Informatics Programs

Uloma Odigbo & Anya Wong

Dr. Christina Eldredge

Generative Artificial Intelligence (GenAI) is transforming Health Informatics education, yet little is known about university guidelines shaping how educators and students use this technology in academic settings. A team of 5, consisting of 3 professors teaching health informatics courses and 2 student research assistants, analyzed GenAI curricula resources retrieved from the websites of institutions listed by the Commission on Accreditation of Health Informatics and Health Information Management Education (CAHIIM) as having accredited master's programs in health informatics. Of the 30 listed institutions, 20 provided resources on GenAI. These resources were broken down into categories based on content, such as guidelines, policies, statements, or taskforces. First, a preliminary thematic analysis was conducted by 2 team members using Nvivo which identified 3 main categories of themes: ethical concerns, faculty guidelines & standards, and student facing policies. Next, a Microsoft Copilot analysis was conducted. Copilot identified 6 key themes within the resources: ethical considerations and responsibility, regulations and compliance, academic integrity, educational impact, implementation and usage guidelines, and data privacy. Preliminary findings indicate gaps in resources development such as lack of discussion on safety measures in the Data Privacy category and variations in resource length, ranging from a couple of paragraphs long to 9 pages long. These disparities may contribute to uneven adoption of GenAI in health informatics programs, potentially leading to educational inequities among institutions. Future research should examine how guidelines impact student outcomes and institutional readiness to address emerging challenges in health informatics.

University of South Florida

Argentinian Mate

Valentina Spalletta

Dr. Wendy Chase

This study comprehends the history behind the long-lasting popularity of Argentinian mate, a drink that has become the national identity of this country. Being born in pre-Colombian South American tribes, it has managed to survive the intricacies of history, naturally becoming a complex cultural component with many variants.

Through a combination of historical analysis of different kinds of sources and my latent calling toward Argentinian flavors, this project examines how mate has transcended its indigenous roots to become a symbol of Argentinian identity, community, and ritual. Mate's popularity persists due to its social function, as it was presented as a demonstration of friendship and respect among civilizations during the 15th century, and it also served as a currency exchange during the

colonial period. Additionally, its caffeine charge and stimulant properties allowed Mate to escalate in the ranking and positioning next to coffee. Finally, mate became a strong symbol of resistance and fellowship during Argentinian independence times.

This research underscores the importance of mate not just as a beverage but as a dynamic cultural practice. It contributes to our understanding of how traditional foods and drinks adapt to contemporary markets while preserving deep-rooted cultural values.

Florida SouthWestern State College

Happiness Among Puerto Ricans in Florida: Factors and Considerations

Varun Nannuri

Dr. Fernando Rivera

Florida is home to the largest Puerto Rican population outside of Puerto Rico, with them making up 21% of the state's total population. This diaspora has long faced unique challenges related to socio-economic factors such as income, education, and healthcare access. Understanding how several factors such as nativity (being born in Puerto Rico or elsewhere) relates to happiness is crucial for analyzing well-being disparities within this group. The study analyzes variables that have been identified in the literature to typically influence happiness, such as marital status, proximity to family, income, level of education, and healthcare access. Data from government agencies, peer-reviewed articles, and surveys conducted by the University of Central Florida's Puerto Rico Research Hub were used to establish qualitative happiness levels among Puerto Ricans living in Florida. The findings suggest that family, marital status, and level of education greatly influence happiness for both groups. However, Puerto Rico-residing Puerto Ricans show a stronger association between income instability and happiness, while Florida-residing Puerto Ricans' happiness face more significant challenges in regard to healthcare access. These results indicate that nativity does influence happiness. This highlights the need for specific policies that are aimed at improving socio-economic conditions for Puerto Ricans, with a focus on enhancing the quality of life in Florida to promote greater happiness and reduce disparities across these communities.

University of Central Florida

Advancing Gene Therapy Techniques for Type 1 Diabetes: A Meta-Analysis Review

Vedaant Mutha & Eavin Valerio

Dr. Rahul Mittal

Type 1 diabetes (T1D) is a chronic autoimmune condition characterized by the destruction of insulin-producing beta cells in the pancreas. This ends up leading to lifelong dependency on exogenous insulin and significant risk of complications including but not limited to cardiovascular disease, neuropathy, and nephropathy. Despite recent advancements in therapeutic management of T1D, achieving optimal glycemic control is still a challenge for many patients. This shows the pressing need for innovative and transformative treatments that address the underlying pathophysiology of T1D. This meta-analysis study will focus on current gene therapy techniques targeting T1D focusing on efficacy and safety. We systematically reviewed preclinical and clinical studies and categorized them based on the type of gene therapy that was being used (beta-cell regeneration, immune modulation, alternative insulin production, etc.). Outcomes mainly focused on beta-cell production through insulin independence, and we also looked at glycemic control and adverse events. Our preliminary findings suggest that strategies that involve beta-cell trans differentiation (changing cells) and immune tolerance induction show significant potential for therapeutic effects, even though challenges still remain in terms of vector delivery and safety. This meta-analysis will provide a comprehensive synthesis of existing data while identifying promising trends and highlighting gaps in current methodologies. By establishing a clearer understanding of the role gene therapy can play in T1D management we can advance the goal of finally achieving a function cure for T1D.

University of Florida

Comparison of Biochar-Enhanced Bioretention Systems with Free- and Elevated-Drainage for Nitrogen Removal from Urban Stormwater Runoff

Vicky Lopez & Julia Manser

Dr. Sarina Ergas

Excess nutrients, such as nitrogen, can lead to eutrophication of water bodies, where an increased growth of algae blocks sunlight from reaching other aquatic plants, and bacteria

deplete dissolved oxygen by feeding on the decaying plants and algae, causing fish kills. These nutrients are present in urban stormwater in low concentrations, which makes them difficult to remove. Current stormwater bio-infiltration systems have inconsistent removal rates for dissolved inorganic nitrogen species (NH_4^+, NO_2^- and NO_3^-). Biochar is a by-product of pyrolysis of organic feedstock, such as wood chips. Biochar has a high surface area, porosity, adsorption capacity and moisture retention. Its negative surface charge favors ammonium (NH_4^+) exchange, which makes it ideal for nitrogen removal. Amending typical bio-infiltration systems with biochar and elevating the outlet pipe has the potential to improve dissolved nitrogen removal. This approach creates zones with oxygen (for nitrification) and little to no oxygen (for denitrification) enabling nitrogen removal through biological processes. In this study, wood chip derived biochar and high permeability media were tested with stormwater in batch, column and pilot-scale studies. Batch kinetic and isotherm adsorption experiments indicated that biochar has some capacity to remove NH_4^+-N and little to none for NO_2^--N and NO_3^--N. Column studies demonstrated incorporating biochar effectively promoted denitrification and nitrification processes. This enhancement resulted in higher removal efficiencies for NH_4^+-N, NO_2^--N and NO_3^--N compared to columns containing only high permeability media. Results from pilot studies indicated that an elevated outlet promotes denitrification more effectively than free drainage.

University of South Florida

The Conundrums of Consciousness

Victoria Adelina Montalvo

Benjamin Oliver

Over the summer, I volunteered at a neuroscience lab located in the University of Miami's Health District. This lab currently studies comatose patients (usually as a result of TBI's—traumatic brain injuries), and their aim is to better develop coma recovery biomarkers to better assess the recovery of the comatose individual. My daily routine consisted of shadowing the Research Assistances as they ran experiments on the patients. They would conduct COVERT experiments: this was to determine whether the patients had some level of consciousness detectable through their eye movements. I would then "tag" these videos to make them easier to analyze for the PI's (primary investigator) in charge.

The question guiding my summer experience was: "What ethical considerations and challenges arise when treating patients with altered states of consciousness, especially regarding patient autonomy, family involvement, treatment efficacy, and the progression of research?"

Hence, my community-based interest surrounds the consideration of ethics in health care and the challenges that arise in the treatment of patients with altered states of consciousness, as well as neurological issues/deficiencies. It particularly ties into the spectrum of patient autonomy whilst the patient may be dealing with such issues, as well as the aspect of how to handle family involvement into the equation. I also am interested in how these two factors may affect treatment effectiveness and the progression of research in this field as the interplaying factors of and the difficult question of "who do we listen to?" may affect this.

Florida State University

Virtual Battles, Real Consequences: Casualty Aversion by Subject Matter Experts in Virtual Combat Scenarios

Victoria Becker Steiner

Dr. Daniel J. Griffin

Myriad studies exist exploring team effectiveness and performance, and which constructs positively or negatively contribute to desired team outcomes. Our research takes this measurement a step further by validating a high-fidelity, virtual combat simulation to study the dynamic processes contributing to team effectiveness and performance in military teams. The first step in this process involves interviewing team researchers, professional game players, first responders, and military personnel to gauge their strategic approach to various combat scenarios. As part of this research, we must uncover the strategic differences between these participants. Teams researchers and professional gamers may have extensive knowledge of team performance, but they have not experienced real-time combat. Compared to first responders and military personnel who are in high-stress scenarios where effective teamwork is vital, the consequences of failure are deadly. Casualty aversion, whether of one's own life, team members, or even the enemy, may be weighted differently depending on exposure to firsthand combat experience. Establishing this difference could help assess the effectiveness and validity of this particular combat simulation. We will conduct a qualitative study of interview content, looking specifically for phrases that indicate value or disregard for the lives of other players (e.g. "careful, incapacitate vs eliminate, shoot on sight"). Participant responses to interview questions

could be used to establish a relationship between casualty aversion, strategy, and personal proximity to real-world experience, which if established would be a significant difference between real and virtual combat that would need to be accounted for in the validation of the simulation.

University of South Florida

Fruits and Vegetables: Catalase Inhibitors

Victoria Hendricks

Dr. Erika Doctor

Flavonoids are a class of chemicals that are found in plants, meaning they are commonly consumed within people's diets. Flavonoids also act as inhibitors within the body. Inhibitors slow down or stop chemical reactions from taking place. In this case, the flavonoids react with the enzyme catalase to inhibit its activity. Catalase in the body is typically associated with the presence of an infection. This leads to increased levels of hydrogen peroxide in the body, which reacts with the catalase. This study examines the flavonoids present in cherries and spinach to determine their effect on catalase activity. Flavonoids were extracted from both cherries and spinach by using a 40% ethanol solution with mashed plant material and then lLiquid-lLiquid eExtraction procedures. The extracts were added to a colorimetric assay, to determine their inhibition of catalase. When catalase activity is inhibited, the assay produces a more intense color change than when catalase is uninhibited. The intensity of the color reaction was measured at maximum wavelengths at 440 nm and 640 nm. Through this experiment, the spinach and the cherry flavonoid extracts both inhibited catalase reactions and were found to have parallel results, both showing a linear increase in inhibition as the amount of flavonoid extract increased. There was no significant difference in the inhibition between the two extracted flavonoids. These results show that fFlavonoids are able to slow down or stop these catalase reactions. This inhibition through the consumption of high flavonoid foods can be beneficial to the body under pathological conditions.

Lynn University

Stearoyl-CoA desaturase 1 (SCD1) CRISPR-Based Knockout in Hepatocellular Carcinoma and its Impact on cell Metabolism

Victoria Rios Ocasio

Dr. Justyna Gleba

Hepatocellular carcinoma (HCC) is the third most common cause of cancer-related deaths worldwide and makes up approximately 90% of primary liver cancer cases. It is imperative to understand the mechanisms by which drug therapies against HCC work to create new biomarkers and facilitate the identification of effective treatments for patients. Stearoyl coenzyme A desaturase-1 (SCD1) is an enzyme that converts saturated fatty acids (SFA) into MUFAs that maintain cell membrane integrity and promote oncogenic signaling. SCD1 expression is associated with poor prognosis in numerous cancers, including HCC and CCA, and it is an attractive target in cancer therapy because it promotes cancer cell proliferation, tumor growth, and metastasis. HCC cell lines are sensitive to inhibition via a small molecule SCD1 inhibitor created in the lab, SSI-4, that blocks de novo lipogenesis and ultimately causes apoptosis. We made the CRISPR-based SCD1 knockout in HCC cell lines to explore the role of the SCD1 knockout in cell metabolism and drug resistance mechanism. Results show that knock-out cells have different morphologies, and a slower cell population doubling time. To understand how the absence of SCD1 changes the cell phenotype for lipid management in HCC cells, we will use a series of assays pertaining to the metabolic processing of lipids, including glucose uptake, fatty acid oxidation, fatty acid synthesis, sterol synthesis, soft agar and lipid droplet assays comparing the wild type and SCD1 knockout cells for comparison. Understanding the molecular pathways used in SCD-1 knockout cells may lead to a better understanding of the impact of SCD1 on cell metabolism and help to identify the pathways used by drug-resistant

University of North Florida

HBA1/2 mRNA Expression in UV Exposed Melanoma Cells

Victoria Sulaman & Victoria Woodcock

Professor Nicole Verity

Melanoma remains a serious issue as it is one of the most dangerous cancers that metastasize quickly. Our goal is to determine if there is an upregulation of HBA1/2 mRNA in melanoma cells as a result of oxidative stress from UV treatment. The foundation for this project was based on a paper where researchers found an upregulation of hemoglobin mRNA, specifically HBA1/2 mRNA, within keratinocytes when exposed to UVA radiation (Tahara et al., 2023). Their results suggested that hemoglobin acts like an antioxidant and can reduce oxidative stress, providing a mechanism to keep keratinocytes safe (Tahara et al., 2023). In Fall 2024, we conducted preliminary experiments to determine the optimal amount of time to expose

our SK-MEL-28 (melanoma) cells to UV radiation, which was 90 minutes. This information will help us proceed with RT-qPCR and other experiments to figure out if there is a relationship between HBA1/2 mRNA upregulation and UV exposure in melanoma cells. This could give insight into a potential way to treat skin cancer as well as provide a greater understanding of melanoma's relationship with hemoglobin.

University of Central Florida

Traction Force Microscopy in Glioblastoma Invasion

Vidhisha Gautam & Taylor Gogolen

Jerome Irianto

Glioblastoma multiforme (GBM) is a highly invasive brain tumor with a poor prognosis due to its ability to infiltrate surrounding brain tissue. Microscopy is achieved by embedding Patient-derived GBM neurospheres in Matrigel to serve as a 3D model. This will allow the quantification of cellular contractility through fluorescent bead displacement analysis. Our study explores the mechanical forces involved in GBM invasion using traction force microscopy (TFM). Confocal live-cell imaging over 48 hours revealed that GBM cells exert increasing contractile forces during the early invasion phase. Upon Blebbistatin treatment, a myosin II inhibitor, contractility and invasion distance significantly decreased, confirming the dependence of invasion on myosin-driven contractility. Interestingly, residual cell movement persisted, suggesting additional mechanisms such as metalloproteinase (MMP) activity in invasion. Our findings provide insights into the mechanobiological factors driving GBM invasiveness and highlight the interplay between cellular contractility and matrix remodeling, proposing TFM as a critical tool for understanding and potentially targeting GBM progression.

Florida State University

Lactate Receptors in Muscular Function and Disease.

Vincent Yang & Nathan Tran

Dr. Stuart R Maudsley

Lactic acid is frequently misunderstood when it comes to general and academic context. While many know of the crucial role that lactic acid plays in the functioning of cells and exercise, it is misunderstood to be a simple byproduct of exercise that leads to muscle fatigue and decreased athletic performance. This is due to more recent studies and research having discovered a more detailed understanding of lactic acid and its role. Rather than being seen as a waste product, it is shown to be an important part of the cellular processes serving as a source of energy for various parts of the body like the heart and brain. Furthermore, lactic acid plays an important role in maintaining the acid-base balance. Despite its important functions, high levels of lactic have also been associated and linked to various health issues such as cancer, heart failure, and particularly muscle diseases like McArdle disease. In conditions such as mitochondrial myopathies, congenital lactic acidosis and other forms of muscular dystrophy, high levels of lactic can indicate problems with the mitochondria, energy production and muscle damage. The purpose of this investigation is to show the historical evolution of lactic acid, correct common misconceptions that is related to its role in exercise, and explore both ends of how lactate is both beneficial and harmful in health and muscular diseases. Understanding the complex physiology of lactate can lead to new therapeutic treatment methods and a better way to improve athletic performance in exercise.

University of South Florida

The James Museum's Art in Mind Program Evaluation

Violet Adams & Isabel Reiter

Dr. Catherine Wilkins

Many museums, including the James Museum of Art (JMA), offer programs for people with Alzheimer's disease and cognitive impairments. However, assessing the efficacy of these programs via self-report questionnaires has proven challenging due to the ranging cognitive abilities of participants. This study has two goals: (1) to analyze data from previous Art in Mind (AIM) sessions at the JMA to assess the impact of the tour on individuals with cognitive impairments and their caregivers, and (2) to create a new caregiver survey to improve measurement of their perspectives on the tours.

We hypothesized that participation in AIM tours would improve mood, increase overall communication, and increase desire to interact with others. Thirty-two participants completed pre- and post-tour surveys comprised of a three-question smiley-face scale designed to evaluate these potential benefits of the AIM tour. While no statistically significant differences were found between pre- and post-tour scores, trends suggested positive effects. Importantly, there were no instances where participant scores worsened, indicating that the tours did not negatively impact

mood, communication, or social interaction. This preliminary analysis suggests the need for a larger participant sample to more accurately assess the effectiveness of the AIM tours and the current survey scale. Additionally, it highlights the importance of developing a new caregiver survey and points to future directions for research in this area.

University of South Florida

Utilizing pneumatic muscles to simulate wingbeat kinematics for a morphing wing

Vireli Anbarasu & Roshan Ramnarine

Dr. Samik Bhattacharya

The controlling muscles of a bird wing change stiffness and length to provide high efficiency when executing a flight maneuver. This variable stiffness allows the muscles to cycle between increasing energy, transmitting it, and restoring it, allowing an overall increase in mechanical and aerodynamic efficiency. Inspired by this, we have developed a system that uses pneumatic artificial muscles (PAMs) to actuate a morphing wing. The stiffness in the PAMS can be controlled to mimic the changes bird flight muscles undergo when executing a forward flapping maneuver. We will evaluate the performance of the PAMs in actuating a morphing wing and examine the efficiency of using this system through a work loop study.

University of Central Florida

Targeting Proton-sensing Receptors in Cancer

Vishwa Murugappan & Matthew Lim

Dr. Stuart Maudsley

This poster highlights colorectal cancer, prostate cancer, and ovarian cancer, linking them to the specific type of GPCRs that can lead researchers into the right direction. Proton-sensing receptors (GPCRs) overall role is pH homeostasis, immune response, and acid-induced pain. Overall, GPCRs are involved in sensing extracellular acidic microenvironments and furthermore, transduced by these environments. They then will be activated intracellular signaling pathways, such as calcium signaling, to affect other cell functions. This study examined GPR4, GPR65, OGR1, three examples of GPCRs. GPR4 primarily couples with G13 Gs proteins to cAMP-dependent pathways, and is maximally activated at a pH of 6.8, playing significant roles in the progression of hepatocellular carcinomas and colorecta cancer through enhanced angiogenesis. ORG1 couples with Gq/11 and Gsproteins to influence PLC/calcium signaling pathways, releasing Ca2+ into the intracellular matrix. ORG1 senses a pH of 6-8 and is directly linked to metastasis of prostate cancer. GPR65 is a receptor that regulates immune responses in the body. It is very sensitive to pH as it is activated by acidic conditions. The optimal pH range for GPR65 is between 5.5 to 6.0, which is consistent with the acidic environment found in areas of inflammation and tumors. GPR65 can be expressed in many immune cells, and depending on its expression it can either activate or inhibit the progression of cancer. GPR65 is relevant to a plethora of cancers: breast, lung, ovarian, and pancreatic cancers, melanoma, and many more.

University of South Florida

Evaluating University Faculty Perceptions of AI in Higher Education: A National Survey

Willa Gutowski

Jonathan Adams

This study investigates university faculty opinions on the acceptability of artificial intelligence (AI) applications in higher education. As AI continues to advance and transform academia, understanding faculty perspectives is critical to ensuring its integration into university life is productive and responsible. Using Thurstone's law of paired comparison, the research establishes a ranking of key faculty concerns and perceived benefits of AI in academic settings. The study surveyed faculty from 92 public universities (the two largest by enrollment in each U.S. state) and 16 private universities, with two departments randomly selected from each institution. Faculty contact information was collected using regex-based web scraping of departmental websites, resulting in 6,005 emailed surveys. Preliminary findings reveal variability in acceptability across faculty, with academic honesty identified as a major concern among skeptics, and improved efficiency highlighted as a key benefit by supporters. Ultimately, this research provides actionable insights for educators and technology developers, guiding the responsible integration of AI into academia while addressing the opportunities and challenges it presents.

Florida State University

Understanding Consumer Response to Polarizing Promotions: An Eye-Tracking Analysis

William Hartman

Dr. Mark Bender

In this research, I use neuromarketing techniques to study how consumers respond to polarizing, and often controversial, topics and figures referenced in marketing promotions and advertisements. This study utilizes eye-tracking to see how consumers visually react to controversial advertisements conspicuously embedded in an article by tracking participants' eye movements and fixations. After reading the article with these advertisements, participants were asked questions about the article, the advertisements, and their viewpoints on particular (polarizing) topics and figures, such as gun ownership, drag as an art form, Colin Kaepernick, and Joe Rogan, all of which are referenced within the controversial advertisements. I hypothesized that if participants agreed with the advertisement's content, they would look at the ad for longer than if they disagreed. However, I found the reverse effect. Using a correlation analysis, correlation coefficients were slightly negative for all four advertisements (ranging from -0.12 to -0.36), indicating that people are likelier to look at a controversial ad for longer if they disagree with the content than if they agree with it. While these results signal to marketers that highly disliked topics and figures could benefit advertisers who seek attention and recall amongst consumers, their use is limited because they are more likely to capture the attention of those who disagree with the particular topic or figure and likely have a negative perception of the use. Further research is needed to show how this tactic would impact a company's overall sales in both the short and long run.

University of Tampa

The Modern Panopticon: Performance and Behavioral Outcomes of Advanced Employee Performance Monitoring

William Tang

Joseph Schmidt

Employee Performance Monitoring (EPM) systems are a workplace tool for increasing worker productivity. However, they can induce counterproductive results among workers like deviant behavior, increased stress, reduced productivity, and organizational distrust. Research indicates EPM outcomes are a function of policy; negative effects are less pronounced when EPM policies consider workers' perceptions of fairness. However, advanced monitoring technologies have the potential to disrupt this understanding of EPM through the scope and invasiveness of their data collection. Our ongoing study seeks to examine the effects that EPM hardware and policy fairness have on performance outcomes and fairness perceptions. Participants will repeatedly complete a vigilance task under different placebo monitoring conditions. We simulate performance monitoring and data collection using a webcam (to represent standard EPM) and an EEG (Electroencephalogram; to represent advanced/intrusive EPM) while providing participants with either a fair or unfair explanation for why they are being monitored and how the data will be used. We predict the EEG will induce a greater degree of negative outcomes pertaining to performance and stress, when compared to the webcam and unmonitored baseline. Furthermore, we believe these results will be in concordance with existing research on policy effects: participants will exhibit the worst performance and behavioral outcomes when given an unfair policy explanation for monitoring under the EEG condition.

University of Central Florida

Increased Longevity of Hydrophilic Property of PDMS for Capillary Pumping Pressure

Wyatt Smith & Sayyada Harry

Christopher Oshman, Ph.D., P.E.

Hypoxic Ischemic Encephalopathy (HIE) is life threatening neonatal brain condition. The incidence rate of HIE is 6/1000 in developed countries or 26/1000 in developing countries, and the mortality rate is 15-20%. Infants who survive often suffer severe lifelong neurological impairments. Moderate and severe cases can be mitigated using therapeutic hypothermia (TH), where cooling reduces the brain's metabolic activity.

The effectiveness of TH can be enhanced by improving heat transfer precision, reducing contact resistance, and increasing the heat transfer rate. A stretchable heat pipe made from polydimethylsiloxane (PDMS) could address these needs. The main hindrance preventing the fabrication of a stretchable heat pipe is the hydrophobicity of PDMS. Oxygen plasma treatment can temporarily reduce the hydrophobicity of the PDMS and allow the material to wick water.

Preliminary research using oxygen plasma shows the PDMS quickly reverts to its untreated state. Experiments were run to determine the exact longevity of the treatment, and what methods can

be used to increase the longevity. The samples were tested at room temperature and elevated temperatures, and the samples were stored both in the atmosphere and in a vacuum. The results of these samples were used to determine the best methods for fabrication of wicks for stretchable heat pipes.

ANSYS, a finite element analysis (FEA) software, was used to simulate the stretchable heat pipe's performance, analyzing capillary pressures, thermal conductivity, and deformation under stretching. These experiments help refine the design of the heat pipe to try to make them more efficient and durable for therapeutic use.

University of North Florida

SCANDAL OF THE STARS: Hollywood's Cancel Culture Carnage

Xavier Harris

Ms. Akeemia Clements

This poster dives into the ongoing phenomenon of cancel culture in Hollywood and how public outrage on social media can significantly impact the careers of industry professionals. In today's world, cancel culture has become a powerful force, serving as both a tool for social justice and a mechanism for accountability. However, for Hollywood stars and other public figures, it also means living under constant scrutiny, where every action or statement is closely examined. This investigation looks at how cancel culture can affect, and sometimes permanently damage, the careers of those in the public eye. Cancel Culture is fueled by social media activity measured in likes, shares, and comments. This is reflected in career outcomes such as job loss, reduced opportunities, or shifts in public perception. Using a mixed-methods research approach, the study combines Quantitative analysis of social media data with Qualitative interviews with industry insiders. This dual approach provides a deeper understanding of how cancel culture operates and draws on the Magic Bullet Theory to explain how powerful and direct social media's influence can be on public opinion and individual reputations. Preliminary findings reveal that while cancel culture often results in tangible consequences such as canceled projects and public backlash it also prompts meaningful conversations about ethics and accountability in the entertainment industry.

Bethune-Cookman University

Lumped Element Modeling of High-Temperature Piezoelectric Pressure Sensors for Space Applications

Xiya Zhou

Mark Sheplak

Accurate, high-bandwidth pressure sensors capable of enduring extreme temperatures are essential for applications such as hypersonic flight vehicle design, geothermal energy harvesting, and space exploration. This research focuses on addressing the challenges in testing and modeling such devices, which require the integration of electrical, mechanical, and acoustic domains. A major challenge lies in developing an overall noise model, as noise interactions between these domains are complex and difficult to gauge without the methods utilized in this work. The project employs lumped element modeling to analogize energy storage, dissipation, effort, and flow sources between the electrical and acoustic domains, and unites them into a single overall circuit model. My role involves designing circuits to assist in testing the piezoelectric pressure sensor at extreme temperatures, using MATLAB and LTSpice for noise modeling. Traditional electronics cannot survive the required temperatures (<800˚C), necessitating thermal isolation, which introduces parasitics that need to be properly managed in order to maintain a good signal to noise ratio (SNR). Through circuit topology modeling, I found that while voltage amplifier topologies generally offer a lower noise floor, charge amplifiers are better for this project's application because they maintain stable sensitivity by mitigating the effects of parasitic capacitance. A fabricated PCB using the charge amplifier design demonstrated wide bandwidth, consistent gain, and low noise floor. The impact of this work could be very significant for space exploration, where accurate pressure sensors are crucial for extreme environments like the surface of Venus.

University of Florida

Prevotella corporis prevents and reverses toxic protein aggregation by activation of a protecitve stress response

Yoan Manuel Argote

Daniel Czyz

The sporadic onset of 90% of neurodegenerative Protein Conformational Disease (PCD) cases underscores the need to identify factors involved in disease pathogenesis. A growing

body of literature has established a correlation between gut dysbiosis and PCDs. Recent work in our laboratory has identified the impact of 229 human bacterial isolates on PCD-associated proteins using Caenorhabditis elegans expressing polyglutamine, Aß1-42, tau, and α-synuclein. We have determined that toxic protein aggregation is robustly suppressed by Prevotella corporis, regardless of the disease-associated protein in the host, suggesting an upstream bacterial effect on host proteostasis. These findings are consistent with literature that associates a depletion in the Prevotella genus with increased PCD occurrence and severity. Here, we elucidate the mechanistic basis of the observed proteoprotective effect that P. corporis has a on the host, specifically the effects this bacterium uniquely exerts on the heat shock response (HSR) and oxidative stress response (OSR), the interactions between these pathways, and their resulting effects on toxic protein aggregation in the host. Using C. elegans expressing hsp70p::GFP as a readout for the HSR and DAF-16::GFP for the OSR, we found that P. corporis not only induces the HSR but also the disaggregation of polyglutamine aggregates, providing mechanistic insights into how this proteoprotective bacterium affects host proteostasis. Our findings suggest a role for bacteria in the sporadic development of PCDs by affecting host stress responses and altering the host's transcriptome, galvanizing a novel microbial approach for managing neurodegenerative disease.

University of Florida

Development of Tumour-targeting Plasmids for Salmonella-based Cancer Therapy

Yu Wei

Dr. Shifeng Wang

Salmonella, known for its facultative anaerobic nature to replicate in tumors and ability to deliver foreign genes into tumors, is a promising candidate for anticancer therapies. However, clinical trials showed that the targeting ability needs to be strengthened. This study focuses on developing tumor-targeting Salmonella vectors. Plasmids carrying targeting peptides were generated through a systematic approach involving vector enzyme digestion, PCR amplification of target fragments, agarose gel electrophoresis, DNA element extraction, DNA quantification, Gibson assembly (a molecular cloning technique that joins multiple DNA fragments in a single reaction) of the vector and target fragment, preparation of electrocompetent cells, bacterial transformation, recombinant plasmid screening, and plasmid verification using PCR and sequencing. The plasmids also have a gene encoding fluorescent protein GFP. As a reporter gene, it presents as an operon fusion with the target peptide, both are under the control of the same Ptrc promoter. A total of 12 different peptides targeting either ovarian cancer or melanoma were generated. Sequencing confirmed the presence of the correct DNA fragments within the constructed plasmids. Currently, these plasmids have been transformed into suitable Salmonella strains. Future steps will assess the ability of the Salmonella strains with these plasmids to target and interact with specific cancer cells. This research represents a novel approach to bacterial-mediated cancer therapy, offering potential breakthroughs in targeted treatment strategies.

University of Florida

Kaempferol Induces Apoptosis in Glioblastoma cells via a Pro-oxidative Mechanism

Yuliet Martinez

Chukwumaobim D. Nwokwu

Glioblastoma is considered the most severe form of brain cancer, and accounts for about 15% of all primary brain tumors. Kaempferol, a flavonoid commonly found in many foods and previously used as an antioxidant and antidiabetic, has recently generated interest as an anti-cancer drug. However, there is paucity of data on studies involving brain tumors. Thus, the present study is aimed at filling some of the knowledge gaps. The inhibitory activity of this putative drug against a glioblastoma cell's (LN-229) viability was assessed by Sulphorhodamine B (SRB) assay. Cells were treated with various concentrations of kaempferol (6.125 – 200 uM) and an established apoptosis-inducer, puromycin (1.25 – 20 uM) at various experimental exposures (24, 48, and 72 h). Significant dose- and time-dependent inhibition of cell proliferation was observed in vitro for both sets of treatments, with comparatively less cytotoxicity against normal human astrocytes ($p<0.05$). Further pro-apoptotic evidence was gathered by microscopic visualization through a phase-contrast microscope, and by agarose gel electrophoresis to evaluate DNA fragmentation. To demonstrate a possible mechanism of action, the treated LN-229 cells were co-incubated with N-acetylcysteine, an inhibitor of reactive oxygen intermediates, which demonstrated that the ROI-mediated apoptosis was reversed. These results posit that kaempferol portends a strong chemotherapeutic potential with minimal side effects, and thus, a drug candidate

for treatment of glioblastoma that deserves further evaluation and development.

Florida Gulf Coast University

Innovating Hope: Commercializing Affordable and Accessible TMA Biosensor Technology

Zachary Asarnow & Ava Polly

Dr. Cesar Rodriguez

Esperance Healthcare presents a holistic approach to addressing trimethylaminuria (TMAU), a rare genetic disorder characterized by the inability to metabolize trimethylamine (TMA), resulting in a persistent odor and significant social and psychological challenges. Building upon the groundbreaking work of the FSU 2023 iGEM team, who developed E. Esperance, a genetically engineered cell-based therapeutic that converts TMA into odorless TMAO, we introduce a complementary biosensor device designed to measure TMA levels with high sensitivity and specificity. This device not only enables real-time monitoring of therapeutic efficacy but also empowers patients and healthcare providers to manage TMAU more effectively. Our business plan emphasizes affordability and accessibility, ensuring that individuals affected by TMAU, especially in underserved communities, can benefit from these innovations. By integrating advanced biotechnology and strategic commercialization, we aim to improve the quality of life for individuals with TMAU and expand the capabilities for diagnosing and managing rare diseases.

Florida State University

Differentiation of Nylon Samples Exhibiting Visually Indistinguishable Fluorescence via Synchronous Fluorescence Spectroscopy

Zachary Holender

Dr. Andres Campiglia

Polymer samples are commonly encountered in forensic analysis, and their general polymer class can be identified nondestructively using vibrational spectroscopic techniques. However, identifying polymer subclasses is more difficult. Fluorescence spectroscopy is a promising tool for the nondestructive examination of nylon samples, as impurities arising from the synthesis and processing of nylons produce observable fluorescence. This phenomenon enables the analysis of nylons based on their distinctive impurities. Nylons originating from the same source are anticipated to exhibit analogous fluorescence, while variations in fluorescence indicate different sources. This study delves into an important scenario wherein different nylons exhibited comparable fluorescence. Nylon 6 and Nylon 6/12 samples displayed excitation-emission matrices, excitation spectra, and fluorescence spectra with no visual distinctions. This complication was remedied using synchronous fluorescence spectroscopy (SFS), where the excitation and emission monochromators are scanned simultaneously at a fixed wavelength offset (Δ). SFS of the investigated nylons were recorded with the aid of a fiber optic probe at Δ = 20, 30, 40, 50 and 60nm. Except for the 50 and 60nm wavelength offsets, all the other Dls were able to differentiate the spectral features of Nylon 6 and Nylon 6/12. Future studies in our lab will expand these investigations to other types of plastics, including polylactic acid (PLA), acrylonitrile butadiene styrene (ABS), and polycarbonate (PC).

University of Central Florida

The Potential Role of Molecular Chaperones in NGLY1 Deficiency

Zachary Jones

Marie Mooney and Szymon Ciesielski

Congenital Disorders of Deglycosylation (CDDGs) are rare diseases characterized by mutations in the genes responsible for the removal of carbohydrate attachments on glycoproteins. The removal of these carbohydrate attachments is necessary for the proper degradation of misfolded glycoproteins. The specific gene of focus in this project is NGLY1, and the term “NGLY1 Deficiency” is used to describe the disease that results from biallelic loss of function mutations in the gene. Some common symptoms of NGLY1 Deficiency in humans include developmental delay, failure to thrive, and intellectual/physical disability. NGLY1 plays an important role in the degradation of glycoproteins by completely cleaving off the glycan attachments. In the absence of NGLY1, glycans aren’t properly cleaved off which results in the accumulation of misfolded glycoproteins. These misfolded glycoproteins are speculated to be the cause of the symptoms observed in patients with NGLY1 Deficiency. The way the cell typically handles misfolded proteins is with a special family of proteins called molecular chaperones. The function of molecular chaperones is to facilitate the refolding or degradation of misfolded proteins within the cell. In this project, we are exploring if molecular chaperones play a role in the removal of accumulated misfolded glycoproteins in Ngly1 deficiency mouse cell lines (MEFs) and within the species Danio rerio (Zebrafish).

University of North Florida

The Role of SLC6A Gene Variants in Neuropathologic Function: A Systematic Review

Zachary Nesta & Anna Barnes

Dr. Olukemi Akintewe

The Solute Carrier 6 Family (SLC6A) is a vast genetic family consisting of 20 subtypes and multiple pseudogenes, which encode for integral membrane proteins involved in secondary active transport. These proteins mediate sodium and chloride ion-dependent shifts of amino acids and their analogs across the cell membrane. The physiological significance of this process takes form in neurotransmitter recycling, fluid balance, metabolism and signal transmission through the synapse. Polymorphisms occurring in the SLC6A gene family can influence behavior and transporter function, further increasing susceptibility of diseases associated with psychiatric, neurologic and metabolic disorders in humans.

This study systematically evaluated multiple peer-reviewed publications of the gene family and its variants that support positive correlations between the presence of SLC genetic abnormalities and subsequent pathological manifestations using various methodologies including genetic association studies and functional genetic assays. The articles reviewed were obtained from multiple online databases including PubMed, NCBI, and Nature.

This review further highlights the novel evidence of SLC6A polymorphs and variants having links to broader aspects of neuroimmunology, in addition to impaired levels of mitochondrial function, and induction of inflammation and oxidative stress.

This systematic review underscores the imperative role that the SLC6A gene family assumes in proper homeostasis, and its standing effects in the presence of abnormalities.

University of South Florida

Water Entry Dynamics of Hydrophobic Spheres Through Cylindrical Pipes

Zamar Joseph & David Vidana-Fuentes

Daren Watson

We move forward the important topic of water entry by documenting splash dynamics arising from the entry of hydrophobic spheres through cylindrical pipes. Water entry through confined spaces is yet another means to manipulate splash dynamics. In this experimental study, we investigate the fluid-structure interactions between the walls of cylindrical pipes and hydrophobic spheres for Froude numbers in the range of 20 - 100. Generally, splashes arising from the water entry of hydrophobic spheres constitute well-developed splash crowns containing miniature jets above the water line, smooth axisymmetric air-entraining cavities below the water line, and vertically-protruding Worthington jets following cavity collapse. Our study unravels the physics behind the widely encountered interaction of solid projectiles navigating confined spaces and our results translate to the entry dynamics of underwater transport related to military and commercial activities.

Florida Polytechnic University

Out of Bounds: The Impact of Social Media on Student Athletes

Zoe Jordan

Akeemia Clements

Social media has become a game-changer for student-athletes, impacting nearly every aspect of their lives, both on and off the field. Platforms like Instagram, TikTok, and Snapchat have created new opportunities for athletes to connect with fans, build personal brands, and even take advantage of Name, Image, and Likeness (NIL) deals. These platforms allow them to expand their careers in ways that were unimaginable a few years ago. But with great opportunities come with big challenges. Social media can bring immense pressure, forcing athletes to constantly balance their digital presence with their academic and athletic responsibilities. This study looks at how social media influences student-athletes, offering both incredible benefits and significant drawbacks. On one hand, platforms help athletes promote themselves, grow their careers, and engage with fans. On the other hand, they create intense scrutiny and pressure to project an idealized image, which can take a toll on mental health. Using Modernization Theory and Qualitative Research Methodology, this research highlights how today's athletes are navigating a new reality where their online presence is closely tied to their visibility and success. The findings show that while social media offers support from fans and exciting opportunities, it also creates a space for criticism and unrealistic expectations. This constant demand to "perform" online can lead to stress, anxiety, and even burnout. By fostering healthier relationships with these platforms, athletes can make the most of the opportunities while protecting their mental health and staying focused on their

Bethune-Cookman University

Investigation of Structure-Function Relation of Oxalate Decarboxylase

Zoe Ringewald, Morgan Bonk, Zoey Chang, Nitish Nandineni, Mahi Athar & Dr. Angerhofer

Dr. Alexander Angerhofer

Oxalate decarboxylase (OxDC), an acid stress regulatory enzyme from Bacillus subtilis, elevates the cytosolic pH by catalyzing the redox neutral unimolecular disproportionation reaction of mono-anionic oxalate into formate and carbon dioxide in the presence of dioxygen. It belongs to the bicupin family of proteins and forms a hexamer (dimer of Trimers) with monomer binding a Mn(II) ion in each of its two cupin domains. Dioxygen is required as an initiator and long-range electron transfer (LRET) between the two Mn ions of adjacent subunits and is essential for catalytic activity. A variant of OxDC identified in Photohabdus luminescens exhibits lower catalytic activity, prompting questions about the relationship between the enzyme's catalytic activity and its hexameric structure. Despite retaining conserved active sites, metal-binding motifs, and the tryptophan dimer (LRET pathway), this variant adopts a trimeric configuration due to the absence of the first 47 amino acids. These residues form the claw-like structure that stabilizes the association of two trimers in OxDC. Understanding the role of the quaternary structure in OxDC is critical for elucidating its catalytic mechanism. This research focuses on engineering a trimeric OxDC by deleting the claw-like structure that stabilizes the canonical hexameric form. Detailed Mechanistic and structural studies of this truncated OxDC will enhance our understanding of the structure-function relationship. Acquiring deeper insights into the catalytic mechanism of OxDC will facilitate its optimization for diverse biomedical and industrial applications, including treating kidney stones and mitigating oxalate crystal formation during paper production.

University of Florida

Investigation of Social Anxiety Subdimensions in Response to Approach-Avoidance Task

Zoe Steelman

Dr. Justin Riddle

Social Anxiety Disorder (SAD) is a psychiatric disorder characterized by persistent and enervative fear of social interactions accompanied by avoidance of these situations. Previous research has examined two significant cognitive processes regarding perceived threat: inaccurate risk perception in the presence of ambiguous social cues and increased avoidance during perceived threat. This study aimed to decipher the relationship between perceived threat in social judgment and symptoms of SAD. The novel social judgment approach-avoidance task (SJ-AAT) was developed, requiring participants to categorize faces as angry or happy, distinguish the extremity of emotions between two faces, and decide to approach or avoid the more extreme face. Participants were diagnosed using the Mini International Neuropsychiatric Interview (MINI) for the DSM-V. Using the Liebowitz Social Anxiety Scale (LSAS), social anxiety symptoms were quantified in four different dimensions: fear of social interaction, avoidance of social interaction, fear of performance, and avoidance of performance. We hypothesize that participants experiencing greater performance fear/avoidance symptoms will have an increased response time during the SJ-AAT when approaching angry faces due to heightened behavioral conflict. Additionally, we expect that participants with high social LSAS fear/avoidance will experience increased difficulty discerning ambiguous facial expressions, as demonstrated by reduced accuracy in difficult trials of the SJ-AAT.

Florida State University

AI Course Companion

Zyad Abd-Elrahman

Dr. Oguzhan Topsakal

Personalized learning tools tailored to course-specific needs are essential for improving student engagement and outcomes. Recent advancements in AI, particularly Large Language Models (LLMs), have enabled the creation of transformative educational solutions. We report our initial efforts to develop the 'AI Course Companion,' an AI-powered tutor designed to support students in achieving course-specific learning objectives. Leveraging Google Gemini, a cutting-edge large language model, and the LangChain framework for multi-agent system implementation, the prototype was developed for the Analysis of Algorithms course at the University of South Florida. By integrating prompt engineering, retrieval-augmented generation (RAG), and multi-agent collaboration, the system provides precise, interactive, and context-aware support. The Course Companion employs a sophisticated architecture, featuring specialized agents that interpret queries, retrieve relevant resources, and ensure adherence to academic guidelines. A Central Orchestrator synchronizes these agents to generate accurate and aligned responses. A PostgreSQL database integrated via Supabase maintains user chat histories, while a user-friendly interface developed with HTML, CSS, and JavaScript connects to a

Flask-powered backend. This project demonstrates the potential of LLMs to create scalable, adaptive educational tools that prioritize accuracy, relevance, and integrity. By addressing challenges in course specificity and student engagement, the AI Course Companion offers a promising step toward innovative, tailored learning experiences in higher education.

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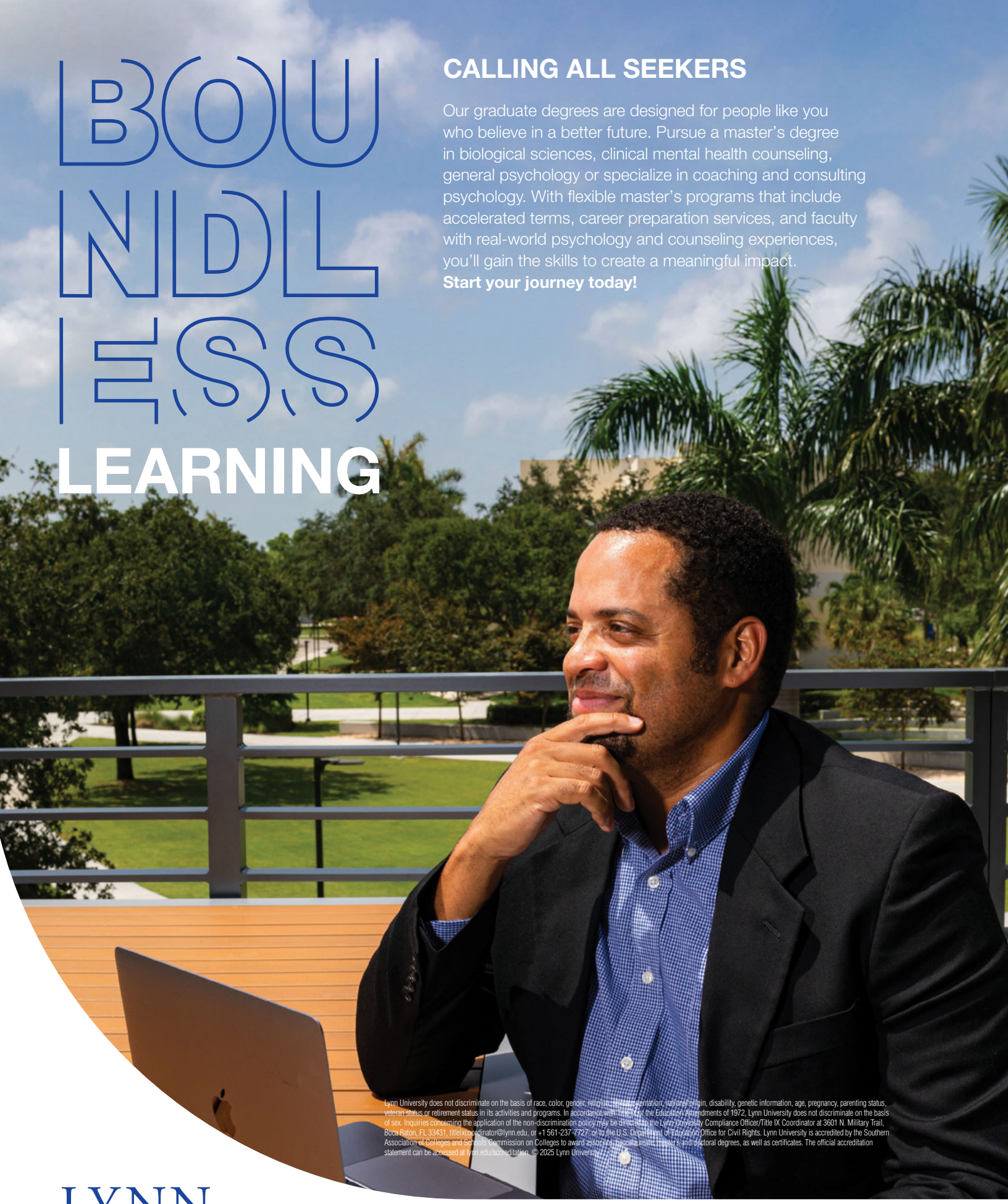

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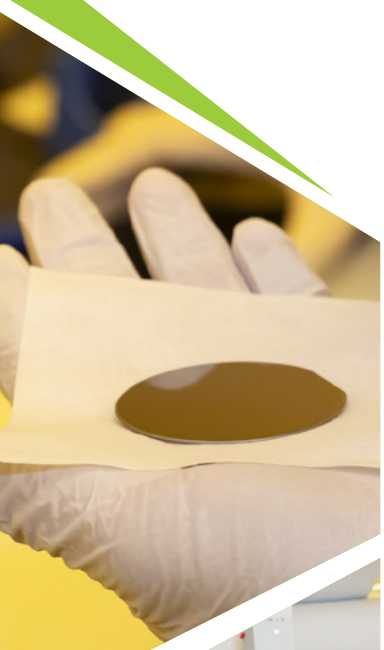

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The graduate and research recruiters (sponsored by the National Science Foundation and the Florida High Tech Corridor) were a great addition to the FURC 2025 offerings, as well. Your time and commitment to recruit students is truly a testament to your commitment to student success.

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Finally, thank you to the Florida Undergraduate Research Association (FURA) for selecting the University of South Florida as the host for the 2025 Florida Undergraduate Research Conference.

Go Bulls!