

# Margaret Mars Brisbin

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## Education

Okinawa Institute of Science and Technology (OIST) Graduate University, Okinawa, Japan, Ph.D. in Environmental and Ecological Sciences; 2014–2020

**Dissertation:** Characterization of Acantharea-*Phaeocystis* photosymbioses: distribution, abundance, specificity, maintenance and host-control

<http://doi.org/10.15102/1394.00001396>

Advised by: Satoshi Mitarai

Stony Brook University, Stony Brook, New York, M.Sc. in Marine and Atmospheric Science; 2008–2010

**Thesis:** Characterization of antimicrobial activity present in the cuticle of American lobster, *Homarus americanus*

<http://hdl.handle.net/1951/55544>

Advised by: Anne E. McElroy & Bassem Allam

St. John's University, Queens, New York, B.Sc. in Biology; 2003–2007, graduated *summa cum laude*

## Professional Appointments

Assistant Professor, University of South Florida, College of Marine Science; 2023–present

Postdoctoral Scholar/Fellow, Woods Hole Oceanographic Institution, Biology and Marine Chemistry & Geochemistry Departments; 2020–2023

Junior Research Fellow (Postdoctoral), Okinawa Institute of Science and Technology; 2020

## Fellowships & Grants

Simons Foundation Postdoctoral Fellowship in Marine Microbial Ecology, \$270,000; 2021–2023

Weston Howland Jr. Postdoctoral Scholar Fellowship, Woods Hole Oceanographic Institution, \$104,350; 2020–2021

Japan Society for the Promotion of Science (JSPS) DC1 Graduate Student Fellowship, \$90,000; 2017–2020

JSPS Grant-in-Aid for Fellows, \$25,000; 2017–2020

Lonely Whale Foundation Science Communication Micro-grant, \$2,000; 2018

NOAA/Sea Grant (Long Island) Graduate Student Fellowship, \$25,000; 2009–2010

## Publications

16. **Mars Brisbin, M.**, Dudley, K. L., Yonashiro, Y., Mitarai, S., Ares, A. (2024) Urbanization of a subtropical island (Okinawa, Japan) alters physicochemical characteristics and disrupts microbial community dynamics in nearshore ecosystems. *bioRxiv*. <https://doi.org/10.1101/2024.01.12.575464>

15. Saito, M. A., Saunders, J., McIlvin, M., Bertrand, E., Breier, J., **Mars Brisbin, M.**, Colston, S., Compton, J. R., Griffin, T., Hervey, J., Hettich, R., Jagtap, P., Janech, M., Johnson, R., Keil, R., Kleikamp, H., Leary, D., McCain, S., Moore, E., Mehta, S., Moran, D., Neibauer, J., Neely, B., Jakuba, M., Johnson, J., Duffy, M., Herndl, G., Giannone, R., Mueller, R., Nunn, B., Pabst, M., Peters, S., Rajczewski, A., Rowland, E., Searle, B., Van Den Bossche, T., Vora, G. J., Waldbauer, J., Zheng, H., Zhao, Z. (2024) Results from a Multi-Laboratory Ocean Metaproteomic Intercomparison: Effects of LC-MS Acquisition and Data Analysis Procedures. *EGU preprints*. <https://doi.org/10.5194/egusphere-2023-3148>
14. Krinos, A. I., **Mars Brisbin, M.**, Hu, S. K., Cohen, N. R., Rynearson, T. A., Follows, M.J., Schulz, F., Alexander, H. (2023) Missing microbial eukaryotes and misleading meta-omic conclusions. *bioRxiv*. <https://doi.org/10.1101/2023.07.30.551153>. In revision with *Nature Microbiology*.
13. Rao, D., Fussy, Z., Moran, D. M., McIlvin, M. R., **Mars Brisbin, M.**, Allen, A. E., Follows, M. J., Saito, M. A. (2024) Flexible B<sub>12</sub> ecophysiology of *Phaeocystis antarctica* due to a fusion B<sub>12</sub>-independent methionine synthase with widespread homologues. *PNAS*.
12. **Mars Brisbin, M.**, Schofield, A.<sup>‡</sup>, McIlvin, M. R., Krinos, A. I., Alexander, H., Saito, M. (2023) Vitamin B<sub>12</sub> conveys a protective advantage to phycosphere-associated bacteria at high temperatures. *ISME Communications*. <https://doi.org/10.1038/s43705-023-00298-6>.  
<sup>‡</sup> **mentee**, summer internship student
11. **Mars Brisbin, M.**, Mitarai, S., Saito, M., Alexander, H. (2022) Microbiomes of the bloom-forming alga *Phaeocystis globosa* are stable, consistently recruited communities with symbiotic and opportunistic modes. *ISME J*. <https://doi.org/10.1038/s41396-022-01263-2>.
10. Aoki, L., **Mars Brisbin, M.**, Hounshell, A. G., Kincaid, D. W., Larson, E., Sansom, B. J., Shogren, A. J., Smith, R. S., Sullivan-Stack, J. (2022) Preparing aquatic research for an extreme future: Call for unified definitions, tools, and approaches. *BioScience* (Cover Article). <https://doi.org/10.1093/biosci/biac020>.
9. Uwizeye, C.\* , **Mars Brisbin, M.\* et al.** (2021) Cytoklepty in the plankton: a host strategy to optimize the bioenergetic machinery of endosymbiotic algae. *PNAS*. <https://doi.org/10.1073/pnas.2025252118>.  
\* co-first authors (contributed equally)
8. Kincaid, D. W., Beck, W. S., Brandt, J. E., **Mars Brisbin, M.**, Farrell, K.J., Hondula, K. L., Larson, E. I., Shogren, A. J. (2020) Wikipedia can help resolve information inequality in the aquatic sciences. *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10168>.
7. **Mars Brisbin, M.**, Brunner, O. D., Grossmann, M. M., Mitarai, S. (2020) Paired high-throughput, in situ imaging and high-throughput sequencing illuminate acantharian abundance and vertical distribution. *Limnology and Oceanography*. <https://doi.org/10.1002/lno.11567>.
6. Ares, A.\* , **Mars Brisbin, M.\***, Sato, K. N., Martin, J. P., Iinuma, Y., Mitarai, S. (2020) Extreme storms cause rapid but short-lived shifts in nearshore

subtropical bacterial communities. *Environmental Microbiology*. <https://doi.org/10.1111/1462-2920.15178>.

\* co-first authors (contributed equally)

5. **Mars Brisbin, M.**, Conover, A. E.<sup>+</sup>, Mitarai, S. (2020) Influence of regional oceanography and hydrothermal activity on protist diversity and community structure in the Okinawa Trough. *Microbial Ecology*. <https://doi.org/10.1007/s00248-020-01583-w>.

<sup>+</sup> **mentee**, summer internship student

4. Arora, J.<sup>+</sup>, **Mars Brisbin, M.**, Mikheyev, A. S. (2020) Effects of microbial evolution dominate those of experimental host-mediated indirect selection. *PeerJ*. <https://doi.org/10.7717/peerj.9350>.

<sup>+</sup> **mentee**, laboratory rotation student

3. **Mars Brisbin, M.** & Mitarai, S. (2019) Differential gene expression supports a resource-intensive, defensive role for colony production in the bloom-forming haptophyte, *Phaeocystis globosa*. *Journal of Eukaryotic Microbiology*. <https://doi.org/10.1111/jeu.12727>.

2. **Mars Brisbin, M.**, Mesrop, L. M., Grossmann, M. M., Mitarai, S. (2018) Intra-host symbiont diversity and extended symbiont maintenance in photosymbiotic *Acantharea* (clade F). *Frontiers in Microbiology*. <https://doi.org/10.3389/fmicb.2018.01998>.

1. **Mars Brisbin, M.**, McElroy, A. E., Pales Espinosa, E., Allam, B. (2015). Antimicrobial activity in the cuticle of the American lobster, *Homarus americanus*. *Fish & Shellfish Immunology*. <https://doi.org/10.1016/j.fsi.2015.03.009>.

## Seminars & Invited Talks

*The complex symbiotic spectrum of bloom-forming Phaeocystis algae: Unraveling benefits and costs in microbial partnerships*. Invited department seminar: University of Southern California, October, 2023; University of Florida, November 2023; Texas A&M University, January 2024.

*The multifaceted symbioses of cosmopolitan Phaeocystis algae*, Moore Foundation Invited Symbiosis Seminar at the Phycological Society of America annual meeting; June, 2023.

*Transcriptional responses to nutrient limitation in the bloom-forming phytoplankton Phaeocystis pouchetii*. Marine Biological Laboratory (U Chicago) MicroEco Seminar; November, 2022.

*Morpho-genetic manipulation of algal symbionts in an abundant planktonic photosymbiosis*. Woods Hole Oceanographic Institution, Biology department seminar; March, 2021.

*Maintenance & manipulation of algal endosymbionts in a unicellular host (Acantharea)*, Nanyang Technical University (NTU) Singapore, Asian School of the Environment; June, 2020.

## Conference Contributions

### Organizer:

Electronic Symposium on Protistology (ESOP), June 2020, virtual

Special Session SS057 Drivers and Impacts of Changing Microbial Ecology in Vulnerable Coastal Systems at the ASLO Aquatic Sciences Meeting 2023, Mallorca, Spain.

#### **Oral Presentations:**

**Mars Brisbin, M.**, Ares, A., Dudley, K. L., Mitarai, S. *Impacts of urbanization on near-shore bacterioplankton dynamics along Okinawa Island, Japan.* ASLO Aquatic Sciences Meeting 2023, Mallorca, Spain.

**Mars Brisbin, M.**, McIlvin, M., Wilburn, D., Alexander, H., Allen, A., Cohen, N., Saunders, J., Shepherd, A., Searle, B. C., Saito, M. *Development and testing of spectral libraries for ocean metaproteomics analyses leveraging the Ocean Protein Portal.* American Society for Mass Spectrometry Annual Conference on Mass Spectrometry and Allied Topics 2022, Minneapolis, MN, U.S.A.

**Mars Brisbin, M.**, Saito, M., Alexander, H. *Exploring the Phaeosphere: Microbial interactions with keystone phytoplankton in the genus Phaeocystis.* Gordon Research Symposium on Marine Microbes 2022. Les Diablerets, Switzerland.

**Mars Brisbin, M.**, Mitarai, S., Saito, M., Alexander, H. *Specific Algal-microbiome interactions mediate the growth of Phaeocystis globosa, a bloom-forming phytoplankton species.* ASLO Aquatic Sciences Meeting 2021, Virtual.

**Mars Brisbin, M.** & Mitarai, S. *Differential gene expression associated with colony formation in the bloom-forming haptophyte, Phaeocystis globosa.* PSA & ISOP Joint Meeting 2018, Vancouver, BC, Canada. <https://doi.org/10.6084/m9.figshare.6916274.v1>.

**Mars Brisbin, M.**, Grossmann, M.M., Mitarai, S. *Friend or Foe: A multiple meta 'omics investigation into the nature of Acantharea-Phaeocystis photosymbiosis.* Ocean Sciences Meeting 2018, Portland, OR, U.S.A.

#### **Poster Presentations:**

**Mars Brisbin, M.**, Saito, M., Alexander, H. *Exploring the Phaeosphere: Microbial interactions with keystone phytoplankton in the genus Phaeocystis.* Gordon Research Conference on Marine Microbes 2022. Les Diablerets, Switzerland.

**Mars Brisbin, M.** & Mitarai, S. *Single-Cell Transcriptome Profiling Reveals Mechanisms of Host-Control and Nutrient Exchange in Acantharea-Phaeocystis Photosymbioses.* Ocean Sciences Meeting 2020, San Diego, CA, U.S.A. <https://doi.org/10.6084/m9.figshare.11575932.v1>

**Mars Brisbin, M.**, Grunert, B., Beck, W. S., Brandt, J.E., Farrell, K. J., Hondula, K. L., Kincaid, D. W., Larson, E. I., Shogren A. J., Zwart, J. *WikiProject L&O: Promoting Wikipedia Contributions to Enhance Communication and Public Impact.* Ocean Sciences Meeting 2020, San Diego, CA, U.S.A.

**Mars Brisbin, M.** & Mitarai, S. *Complementing high-throughput sequencing with high-throughput imaging to illuminate abundance and life history of photosymbiotic acantharians*. ASLO Aquatic Sciences meeting 2019, San Juan, Puerto Rico. <https://doi.org/10.6084/m9.figshare.7751060.v2>. **Student Travel Award Recipient.**

**Mars Brisbin, M.**, Emborski. C. K., Mikheyev, A. S. *The role of gut bacteria in the inheritance of acquired metabolic phenotypes*. Gordon Research Conference on Animal-Microbe Symbioses 2015, Waterville Valley, NH, U.S.A.

#### **Conference Workshop:**

Limnology and Oceanography WikiWorkshop, ASLO Aquatic Sciences Meeting 2019, San Juan, Puerto Rico

#### **Teaching Experience**

#### **Undergraduate Courses:**

Guest lecturer, Phytoplankton and Primary production lectures (2) for Oceanography course, Brandeis University; 2022

Oceanography, TA, Brandeis University; 2021

Marine Biology, Instructor of record, Georgia Military College; 2014

Women In Science & Engineering (WISE) Introduction to Research in Marine Science, Instructor of record, Stony Brook University; 2010

General Chemistry, TA, Stony Brook University; 2009

Environmental Microbiology, TA, Stony Brook University; 2008

#### **Workshops:**

Introductory workshop in R, Woods Hole Oceanographic Institution; Summer 2021 (undergraduate program) and Fall 2021 (graduate students and technical staff)

Bioinformatics bootcamp, Marine Biological Laboratory (MBL); 2021

Reproducible data science with R and Git, Woods Hole Oceanographic Institution; 2020

R for social scientists, South African Centre for Digital Language Resources (SADiLaR); 2020

Editing Wikipedia for Scientists, OIST; 2020

R for reproducible science, OIST; 2020

RNA-seq data analysis, OIST; 2019

Data Intensive Biology Summer Institute (DIBSI) Next-Gen Sequence Analysis Workshop, UC Davis; 2019

#### **Study Abroad/Field Courses:**

Shark Biology and Conservation (3 credits), Fiji, Broadreach/Lesley University, MA; Summer 2014

Ichthyology (3 credits), Thailand, Broadreach/Lesley University, MA; Summer 2013

Marine Conservation and Policy (3 credits), Caribbean, Broadreach/Lesley University, MA; Summer 2012  
Marine Biology (3 credits), The Bahamas, Broadreach/Lesley University, MA; Summer 2011

**Secondary Education:**

Middle School Science Teacher (grades 6–8), Salam Academy, Albuquerque, NM; 2011–2013

**Service**

**Academic Reviewer:** *Nature Communications Earth and Environment, Limnology and Oceanography, Science of the Total Environment, Harmful Algae, Journal of Oceanology and Limnology, Algal Research, Frontiers in Microbiology, Frontiers in Marine Science, Applied and Environmental Microbiology*

**WHOI Postdoc Association representative (elected position); 2022**

**WHOI Women’s Committee, Postdoc representative; 2022**

**Nerd Nite Okinawa, Organizer and chapter founder. Okinawa, Japan; 2018–2020**

**OIST Internal Seminar Series, Coordinator, OIST; 2017–2020**

**Academic Officer (elected position) to the Student Council, OIST; 2017**

**Other Awards**

Student Excellence in Community Service Award, OIST; 2019

International Year of the Reef Award for Science Communication and Outreach, University of Queensland Coral Watch; 2018

**Sea Experience**

*R/V IB Nathaniel B. Palmer*, NSF, Palmer Long Term Ecological Research Cruise, Southern Ocean, **40 sea days**, 2021

*R/V Endeavor*, UNOLS, Particulate Carbon Gulf of Maine Biogeochemistry cruise (PC-GUMB), sampling for plankton and seawater chemistry, **5 sea days**, 2021

*R/V Mirai*, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), plankton surveys and hydrothermal vent discovery throughout the Kuroshio Current, **14 sea days**, 2017

Okinawa Prefectural Research Center ship *Tonan-Marui*, two three-day coastal plankton surveys, **6 sea days**, 2015 & 2016

*R/V Kaiyo-Marui* No. 2, Kaiyo Engineering (Japan), offshore plankton sampling and instrument deployments, **5 sea days** in 2015, **7 sea days** in 2016

NOAA ship *Delaware II*, volunteer on Northeast Ecosystem Monitoring (EcoMon) cruise, **10 sea days**, 2010

NOAA ship *Oregon II*, volunteer on Shark/Red Snapper longline survey, **28 sea days**, 2010

**Total: 115 sea days**