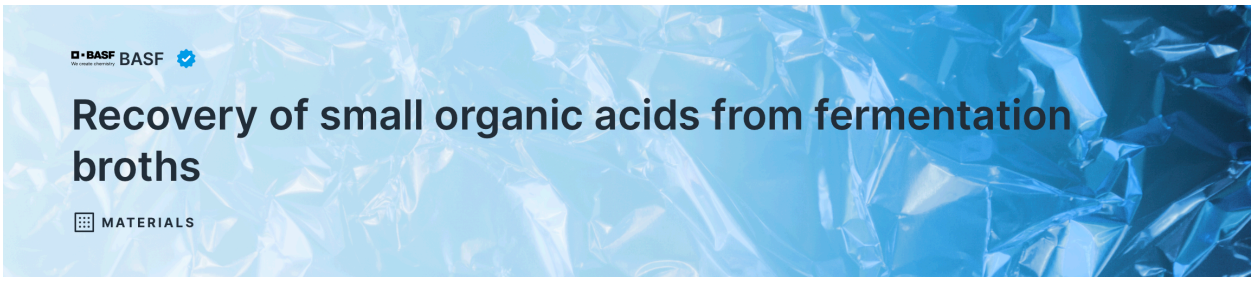

Background
Small acids (e.g. malic acid, fumaric acid, propionic acid, succinic acid, etc.) are essential in various industries, serving as chemical precursors, antimicrobials and acidulants in the cosmetic, pharmaceutical, food and chemical sectors. These acids are promising candidates for production from biobased raw materials via fermentation, given their well-established biosynthetic pathways. The production of such acids requires a strict pH buffering system leading to accumulation of salts. In addition, acids are usually water soluble and therefore difficult to separate from the fermentation broth. To mitigate this issue, the conventional approach is to neutralize the organic acids by adding a base into the fermentation medium, converting the acids into their corresponding salts, causing them to precipitate from the broth. However, this process leads to large waste streams of a mixture of salts, both desired and undesirable that require energy-intensive separations and processes to recycle. An alternative approach involves in-situ extraction of the organic acids using an organic solvent such as ethyl acetate. However, the efficiency of this process depends on the concentration and partition coefficient of the organic acid, often requiring high solvent flows, which increase solvent use and operational costs.

What we're looking for
We are looking for new technologies that enable the isolation of small organic acids (C2-C6) from dilute aqueous fermentation broths. The solution should achieve high yields, while being more energy- and waste-efficient compared to the processes described above. We want to avoid large waste streams (e.g. salt load) and achieve attractive cost targets for the end products.

Solutions of interest include:
- Advanced membrane filtration
- Adsorption-based extraction using functionalized particles
- In-situ reactive extraction
- Electrodialysis
- Solvent-efficient liquid extraction
- Crystallization technology

Our must-have requirements are:
- Efficient removal of small organic acids (C2-C6) from fermentation broth through downstream processing.
- Downstream process should result in individual purified organic acids.
- Should be able to file or license intellectual property (IP).

- Compatibility to fermentation processes already established at least in lab scale.

Our nice-to-have's are:
- Process development for fermentation stream processing (continuous process) is preferred over batch processing.

What's out of scope:
- Screening of acid-tolerant production strains.
- Major re-engineering of existing production strains.
- New fermentation methods.

Acceptable technology readiness levels (TRL): Levels 3-5
1. Basic principles observed
2. Concept development
3. Experimental proof of concept
4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you
Eligible partnership models:
- Sponsored research
- Licensing

Benefits:
- **Sponsored Research**
  Funding is dependent on the proposal's extent, but an accepted proof of concept proposal could expect support in the range of $25,000 - $100,000 (milestone dependent) to establish feasibility with the potential for follow on funding.
- **Expertise**
  Partners will have access to internal team/ experts as appropriate

Reviewers

Lauren Junker
Technology Scout

Tom Holcombe
Collaboration & Scouting NA

Kavita Bitra
Technology scout

Barbara Nave
projekt manager

Michael Breuer
Project Accounting

Please contact the University of South Florida Technology Transfer office representative for submission – Karla Schramm at kschramm@usf.edu