Karen Draths

Synthetic Biology, Organic Chemistry

Assistant Professor

(b. 1964)

B.S., 1986,
Saint Mary's College;

Ph.D., 1991,
Stanford Univ.;

American Cancer Soc. Fellow, 1991-92,
California Institute of Technology;

Research Assistant Prof., 1994-2007,
Michigan State Univ.;

Co-founder, Senior Scientist and President, 2005-10,
Draths Corporation;

Assistant Prof., 2011-present,
Michigan State Univ.

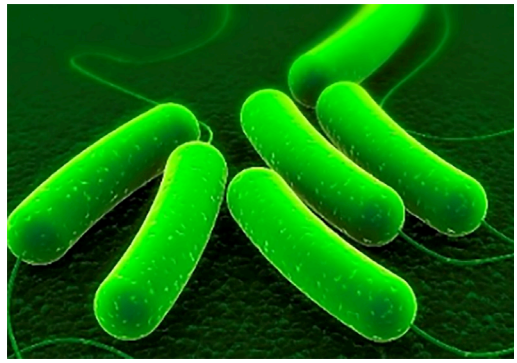
517-353-0499

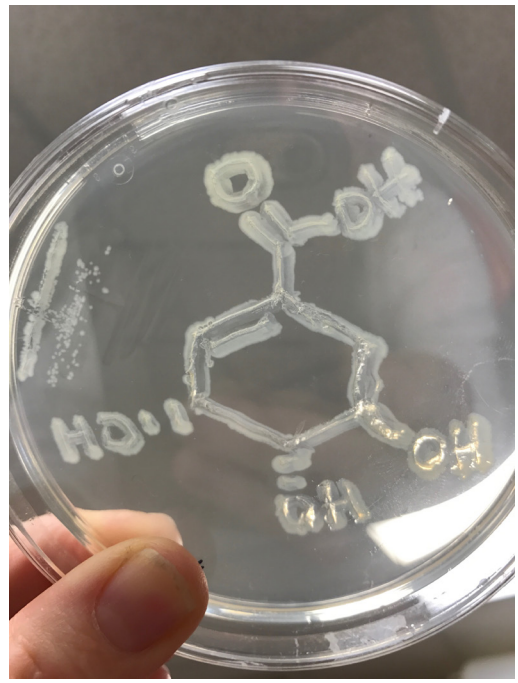
The Draths research group creates microbial organisms for use in chemical synthesis. Our research encompasses creation of new metabolic pathways that do not exist in nature, construction of the microbial chassis needed to express these pathways, and subsequent microbial synthesis of targeted chemicals under controlled culture conditions in batch reactors. An iterative approach to catalyst design and evaluation allows us to evaluate the feasibility of newly created, microbe-catalyzed syntheses in both pharmaceutical and large-scale commodity chemical applications.

We have two significant areas of interest:

- Enabling microbes to synthesize commodity chemicals from methane.
- Microbial synthesis of highly functionalized molecules.

Researchers in the lab will receive training in a variety of disciplines that may include organic synthesis, analytical methodology, molecular biological techniques, protein expression and purification, execution of enzyme assays, and operation of batch fermentation reactors. We welcome researchers who seek a multidisciplinary education. If you are interested in changing the landscape of chemical synthesis and building a research effort from the ground up, check us out!





Selected Publications

Creation of a Shikimate Pathway Variant, Ran, N.Q.; Draths, K. M.; Frost, J. W., *J. Am. Chem. Soc*. **2004**, *126*, 6858-6857.

Phosphoenolpyruvate Availability and the Biosynthesis of Shikimic Acid, Chandran, S. S.; Yi, J.; Draths, K. M.; von Daeniken, R.; Weber, W.; Frost, J. W., *Biotechnol. Prog*. **2003**, *19*, 808-814.

Benzene-Free Synthesis of Adipic Acid, Niu, W.; Draths, K. M.; Frost, J. W. *Biotechnol. Prog*. **2002**, 18, 201-211.

Biocatalytic Synthesis of Quinic Acid and Conversion to Hydroquinone, Frost, J.W.; Draths, K.M., U.S. Patent 7,002,047; February 21, 2006.

Biocatalytic Synthesis of Shikimic Acid, Frost, J.W.; Draths, K.M.; Knop, D.R., U.S. Patent 6,613,552; September 2, 2003.