



Modified Microbes Tolerate 50-Fold More Organic Acid

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WARF: P120017US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing cyanobacteria genetically modified to tolerate high yields of building block chemicals like 3HP.

Overview

Production of industrial chemicals has long relied on petroleum-based starting material. As reserves of fossil carbon dwindle, a new approach is looking to microorganisms and their ability to convert renewable sources into valuable chemicals.

The U.S. Department of Energy (DOE) recently targeted several 'building block' chemicals that could be produced from renewable resources. One such target is 3HP (3-hydroxypropionic acid), which readily is transformed into commodity chemicals like acrylic acid. These chemicals represent a multibillion dollar industry.

Problematically, 3HP and many other industrial chemicals actually are toxic to the microbes that produce them. This has constrained output. It is critically important to develop chemically tolerant strains capable of industrial-scale yields.

The Invention

UW-Madison researchers have genetically modified microorganisms to better tolerate organic acids like 3HP, acrylic acid and propionic acid. The modified microorganisms are cyanobacteria such as *Synechococcus*.

In the modified bacteria, the *acsA* gene is replaced or deleted. This leads to increased organic acid tolerance.

Applications

- Industrial bioproduction of chemicals, including 3HP and acrylic acid

Key Benefits

- Huge improvement in organic acid tolerance
- Outperforms other modified strains

Stage of Development

The modified cyanobacteria have shown 50-fold improvement in organic chemical tolerance, growing at 50g/L of 3HP.

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For More Information About the Inventors

- [Brian Pfleger](#)

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Related Technologies

- [For more information about using modified bacteria to produce medium- to long-chain hydrocarbons for biofuels and specialty chemicals, see WARF reference number P09329US02.](#)

Related Intellectual Property

- [View Continuation-in-Part Patent in PDF format.](#)
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Tech Fields

- [Materials & Chemicals : Biochemicals & biomaterials](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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