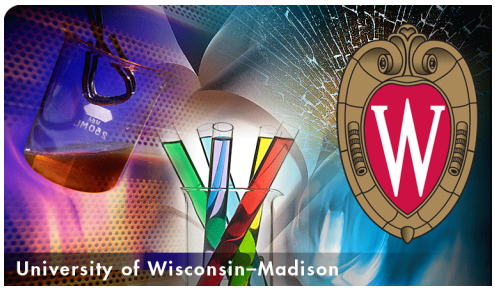

Microbes Produce High Yields of Fatty Alcohols from Glucose

INVENTORS • Brian Pfleger, J. Tyler Youngquist

WARF: P140076US02

View U.S. Patent No. 9,708,630 in PDF format.

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method to produce fatty alcohols for biofuel and specialty chemicals using genetically engineered microorganisms.

OVERVIEW

Fatty alcohols are used in detergents, emulsifiers, lubricants and personal care items. More than 1.3 million tons of fatty alcohols are used worldwide each year, representing a $3 billion market.

Currently, fatty alcohols are produced either through the processing of natural fats and oils or from petrochemicals. As both routes require biodiesel or petrochemical fuel stocks, microbial production of fatty alcohols from renewable sugars is a promising alternative.

To be economically competitive, microorganism-based methods must boost titers and yields.

THE INVENTION

UW–Madison researchers have developed a method to produce fatty alcohols such as 1-dodecanol and 1-tetradecanol from glucose using genetically engineered microorganisms. The organism, e.g., a modified *E. coli* strain, overexpresses several genes (including *FadD* and a recombinant thioesterase gene, acyl-CoA synthetase gene and acyl-CoA reductase gene). Other gene products are functionally deleted to maximize performance.

The strain is cultured in a bioreactor in the presence of glucose.

APPLICATIONS

- Production of fatty alcohols for biofuels (e.g., jet fuel) or specialty chemicals

KEY BENEFITS

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

- Some of the highest yields ever reported using *E. coli* and glucose
- Other organisms such as yeast or Gram-positive bacteria may be used.

STAGE OF DEVELOPMENT

The modified *E.coli* strain is capable of generating yields higher than 0.13 grams of fatty alcohol per gram of consumed glucose.

The development of this technology was supported by WARF Accelerator. WARF Accelerator selects WARF's most commercially promising technologies and provides expert assistance and funding to enable achievement of commercially significant milestones. WARF believes that these technologies are especially attractive opportunities for licensing.

ADDITIONAL INFORMATION

Related Portfolios

WARF Accelerator Program Technologies

UW–Madison Technologies Developed Through the Great Lakes Bioenergy Research Center

Related Technologies

WARF reference number P09329US02 describes genetically modified *E. coli* that are capable of overproducing fatty acid precursors for medium- to long-chain hydrocarbons.

Publications

Youngquist J.T., Schumacher M.H., Rose J.P., Raines T.C., Politz M.C., Copeland M.F. and Pfleger B.F. 2013. Production of Medium Chain Length Fatty Alcohols from Glucose in *Escherichia coli*. Metabolic Engineering. 20, 177-186.

Tech Fields

Materials & Chemicals - Biochemicals
Clean Technology - Biofuels & renewable fuels

CONTACT INFORMATION

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