



# Great Lakes Bioenergy

## WHO WE ARE

The Great Lakes Bioenergy Research Center (GLBRC) is a cross-disciplinary research center led by the University of Wisconsin–Madison. With Michigan State University and other collaborators, GLBRC draws on the expertise of over 400 scientists, engineers, students, and staff to develop sustainable biofuels and bioproducts.

Created in 2007 by the U.S. Department of Energy, GLBRC focuses on three areas of research: sustainable cropping systems, efficient biomass conversion, and field-to-product integration. Together, we are helping to replace petroleum-derived fuels and products and enable a new generation of biorefineries.

Our mission is simple: creating biofuels and bioproducts that are economically viable and environmentally sustainable.

### A record of success

Since 2007, GLBRC has conducted foundational research on biofuels. Our scientists and engineers have produced more than 1,488 scientific publications, 240 patent applications, 110 licenses or options, and five start-up companies.

### Integrated research

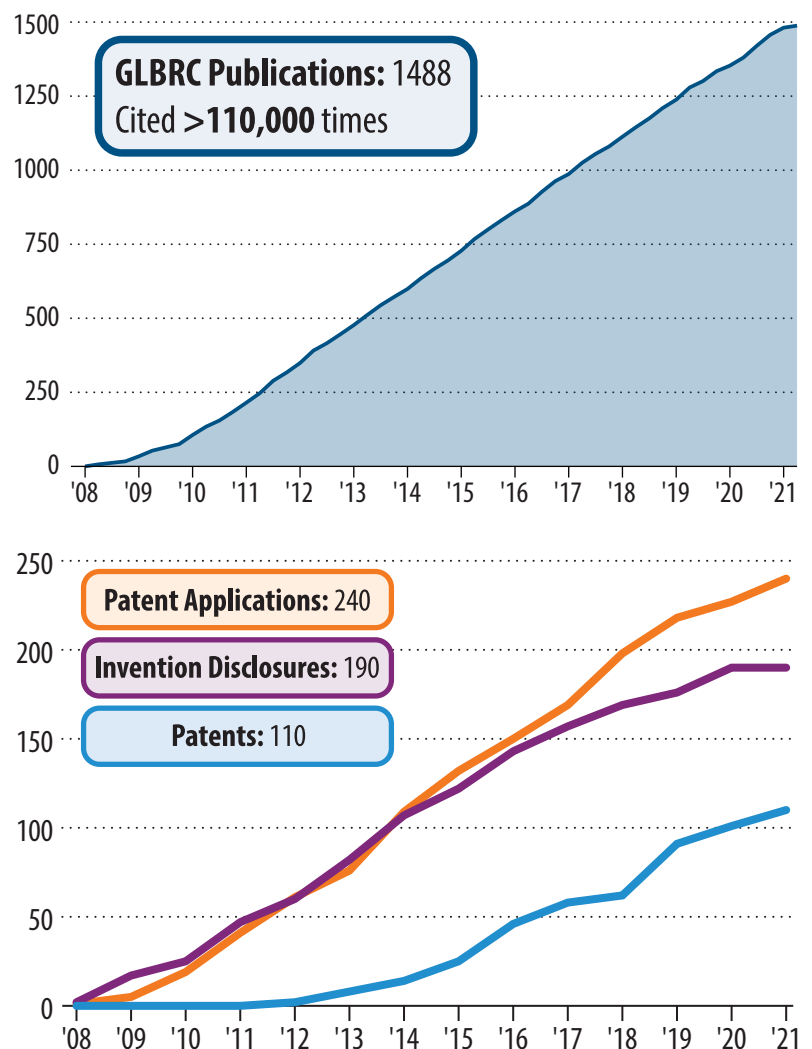
GLBRC research is collaborative, integrated, and rich in partnerships with industry. Our diverse experts work together to overcome the barriers to producing sustainable biofuels and bioproducts.

### Technology transfer

At GLBRC, we work with companies and with licensing experts at the Wisconsin Alumni Research Foundation (WARF) and MSU Technologies to ensure that our research anticipates and enables commercialization and creates new economic opportunities for biorefiners, farmers, and rural communities.

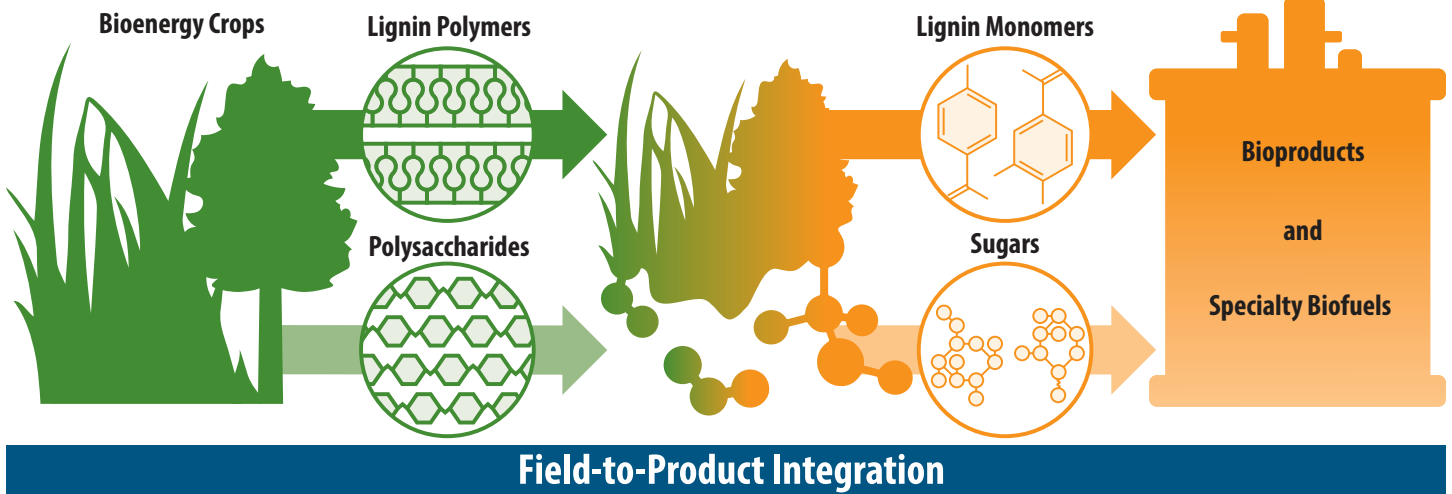
## Our Vision

Producing sustainable biofuels and bioproducts from all usable portions of dedicated energy crops grown on marginal, or non-agricultural, lands.



## Sustainable Cropping Systems

## Efficient Biomass Conversion



## Our Research

### Sustainable cropping systems

*Engineering bioenergy crops to enhance their environmental and economic value*

GLBRC's research focuses on dedicated bioenergy crops grown on marginal, or non-agricultural, land. Planting non-food crops such as switchgrass, energy sorghum, or poplar on marginal land reserves arable U.S. farmland for food production and has the potential to provide a range of environmental benefits such as climate change mitigation and increased diversity. Our goal is to engineer cropping systems with both environmental and economic value. This means finding ways to produce dedicated energy crops with high yields and optimized processing traits, as well as determining how and where these energy crops should be produced.

### Efficient biomass conversion

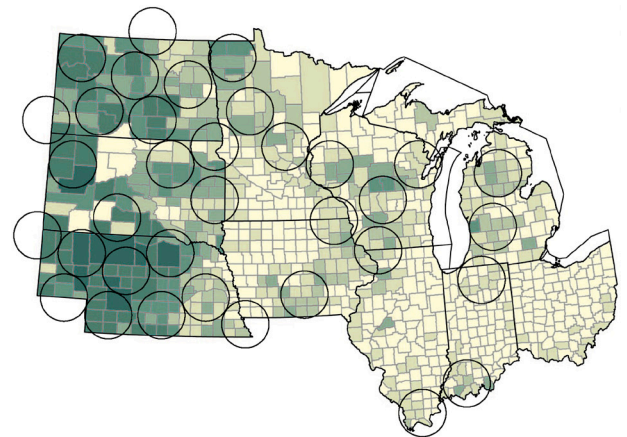
*Generating multiple products from plant biomass*

GLBRC is focused on enabling a new and different biorefinery, one that is both economically viable and environmentally sustainable. Realizing this goal will mean increasing the efficiency of biomass conversion and generating a mix of specialty biofuels and bioproducts from as much of a plant's biomass as possible. Our research seeks to boost industry economics by finding new ways of processing biomass at low cost, producing a variety of fuels for use in multiple engine types, and converting as much material as possible into bioproducts that are valuable to industry.

### Field-to-product integration

*Understanding and optimizing the field-to-product pipeline*

GLBRC research is integrated across many disciplines and areas of focus. We understand our work as part of the field-to-product pipeline and coordinate our efforts to overcome the barriers to producing sustainable biofuels and bioproducts. The field-to-product pipeline for biofuels and bioproducts consists of several interdependent phases, including crop production, biomass deconstruction, and conversion into products. Our multi-disciplinary research projects are focused on improving these individual steps as well as integrating them into an optimized field-to-product pipeline.



*Understanding how to produce high yields of dedicated energy crops on marginal lands could provide new income to biomass producers and abundant feedstocks for industry, while offering major ecosystem benefits and reserving farmland for food production.*

## Contacts

### Tim Donohue

Principal Investigator, Director  
tdonohue@bact.wisc.edu  
(608) 262-4663

### Yiying Xiong

Associate Director  
yiying.xiong@wisc.edu  
(608) 263-6592

### Robert Landick

Science Director  
landick@bact.wisc.edu  
(608) 265-8475

### G. Philip Robertson

Science Director  
robert30@msu.edu  
(269) 760-8364