



OAK RIDGE NATIONAL LABORATORY

# The Center for Bioenergy Innovation

The Center for Bioenergy Innovation (CBI), led by Oak Ridge National Laboratory (ORNL), is custom-engineering feedstock plants and microbes for a sustainable bioeconomy. CBI builds on a robust legacy of scientific understanding to provide breakthroughs for a new generation of cost-effective, environmentally positive, and industrially relevant bioproducts and biofuels, including sustainable aviation fuels.



*ORNL's plant phenotyping system aids scientists in connecting plant gene functions to observable traits through automated, high-throughput measurement of key plant characteristics.*

## Moving toward Bioproducts from Biomass

The vision for CBI is to accelerate domestication of bioenergy-relevant plants and microbes to enable high-impact, value-added coproduct development at multiple points in the bioenergy supply chain. Our central, integrated focus areas are described below.

**Plant genomics and bioengineering**—Developing sustainable biomass crops, including perennial nonfood crops that thrive in the suboptimal environment of marginal lands; require less water, fertilizer, and pesticide; and are more easily broken down and converted to advanced biofuels and bioproducts

**Conversion processes**—Improving processes using microbes engineered to simultaneously break down and convert plant biomass into key molecules, which are then catalytically upgraded to create drop-in blendstocks for biofuels such as sustainable aviation fuels while increasing efficiency and lowering costs of production

**Value-added products**—Using new microbes and methods to convert the lignin residuals from bioprocessing into valuable products such as renewable chemicals that replace petroleum-based feedstocks

19

CBI partners

32,940

Citations in the past 3 years

1 of 4

DOE Bioenergy Research Centers

250+  
Scientists

307

Publications in the past 3 years

"We're developing new biomass feedstocks, engineering microbes and catalysts to produce drop-in fuels from biomass, and creating microorganisms to convert lignin into highly valued products."

**Jerry Tuskan, CEO, Center for Bioenergy Innovation**



# Research and Development Focus Areas



**Sustainability**—Harness natural diversity and beneficial plant–microbe interactions to realize bioenergy crops that are drought tolerant, use fertilizer more efficiently, and are resistant to pests and pathogens



**Feedstock development**—Use genomics-based approaches to rationally design biomass feedstocks with high yield, composition, and uniformity for biofuel and bioproduct production



**Deconstruction and separation**—Eliminate the high cost of chemical pretreatment and enzymes by using engineered microbes to simultaneously break down, refine, and convert biomass into key intermediates



**Conversion to specialty biofuels and bioproducts**—Achieve advanced fuels from biomass and value-added coproducts from lignin residues by using improved microbial and catalytic platforms

## CBI Collaborations and Affiliates

CBI has among its goals an effective, coordinated path toward successful technology commercialization across the bioenergy supply chain through licensing to companies pursuing biofuels development. The program is open to industry, academia, nonprofits, and individuals.



## CBI Partners



DARTMOUTH



UC DAVIS



Xenotsolutions LLC

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