



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 microbes and plant feedstocks 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 Advanced Plant Phenotyping Lab (APPL) connects plant gene functions to observable traits with fast, automated measurement of plant characteristics and AI-enabled data analysis.

Supporting a Thriving Bioeconomy

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 resilient 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 chemicals and materials to support the bioeconomy

17

Research partners

120,554
Citations

1,600

Publications

260

Scientists

37

Patents

"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."

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



Research and Development Focus Areas



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



Resilience—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

CBI Collaborations and Affiliates

CBI has among its goals an effective, coordinated path toward successful technology commercialization across the bioenergy supply chain by licensing to companies pursuing biofuels development, getting feedback on key challenges, and collaborating on research. The program is open to industry, academia, nonprofits, and individuals.



CBI Partners



Poplar Innovations Inc.



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