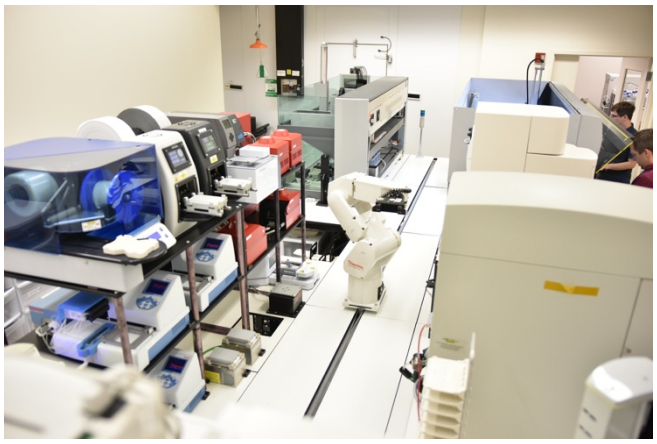
CABBI FACT SHEET: Phase I Highlights

CABBI will build on the following accomplishments from 2017 to ’22:

- Advancing genetic work on bioenergy crops to improve oil and other chemical production directly in the leaves and stems of bioenergy grasses. Breakthroughs included new lines of sugarcane and sorghum that divert plant sugars to oil production and the first-ever genome sequencing and CRISPR/Cas9 editing of miscanthus, making it easier to maximize its valuable traits.

- Demonstrating a “pipeline” that takes bioenergy crops and processes them into biofuels and valuable biochemicals in the state-of-the-art Integrated Bioprocessing Research Laboratory (IBRL) at Illinois. Researchers developed new biomass treatment methods to maximize the oils and sugars recovered from crops to make biofuel production economically feasible.



- Developing new genetic toolkits and catalysts to engineer robust yeasts that can economically convert plant-derived sugars and oils into biofuels, organic acids, and other industrial chemicals — used in everything from detergents to cosmetics, food additives, and phone screens.
- Creating an automated biofoundry at IGB, a self-driving system that combines machine learning with robotic components to rapidly engineer new enzymes and yeast strains for the next generation of valuable bioproducts.
- Integrating economic and ecosystem models to help understanding of how bioenergy crop production and processing affect the environment, food production, consumers, and the economy.
- Studying fuel policies and farming practices to understand the barriers and incentives that might influence a switch from traditional crops to bioenergy feedstocks. In one innovative study, researchers used satellite data to examine land-use changes over time and identify economically marginal land suitable for low-cost conversion to bioenergy crops without disrupting food production.
- Launching BioSTEAM, an open-source simulation software package that gives scientists, engineers, biotechnology companies, and funding agencies a fast, flexible tool to analyze the economics and the environmental impact of producing biofuels.
- Using satellite imagery and supercomputing capabilities to accurately measure photosynthesis from space and to help quantify how plants process carbon dioxide on a warming planet.