



## Integrated Bioprocessing Research Laboratory Planned for the University of Illinois campus

**Bioprocessing product research and development facility that bridges the gap from basic discovery to commercialization of biofuels and chemicals**

Moving from basic research discoveries to commercial products requires a unique facility where various plant and plant co-products (biomass) can be tested for their suitability for bioprocessing to value-added products. An important dimension of this work is to scale up processes from the lab bench using an integrated small-scale pilot plant facility. The integrated bioprocessing research laboratory (IBRL) fills this gap in the channel from innovative research to market application and commercial products.

"From Day One I have thought there are multiple opportunities for NCERC and UIUC (IBRL) to collaborate. I see many opportunities for scale-up work going from: Laboratory – IBRL – NCERC – Commercialization." John Caupert, Director, National Corn-to-Ethanol Research Center

This investment will leverage the infrastructure and strengths of the University and the State in plant biotechnology and capture the potential of industrial biotechnology to create novel biobased fuels and chemicals. Corn stover together with dedicated energy crops such as Miscanthus and Switchgrass can serve as the plant technology platforms for a new biobased economy. This investment will empower Illinois to build on its strengths and lead in the growth and development of the biobased economy creating new jobs and economic opportunities for agricultural producers and for the processing industries for which the State is well known.

"The Energy Biosciences Institute shared between Illinois and Berkeley is currently the largest single investment in University research to underpin second generation biofuel production. This is making Illinois a center for discovery and breakthroughs in achieving these biofuels. Realizing the commercial opportunities that this represents within the State of Illinois, rather than elsewhere, will depend on the availability of scale-up facilities. Here the vision of the IBRL will be critical." Steve Long, Deputy Director Energy Biosciences Institute.

**Vision:** Activities in the Integrated Bioprocessing Research Lab will specifically focus on the intermediate scale up of bench level processes as part of a continuum leading to commercialization of processes for economical production of biofuels and chemicals. Included in the lab will be state-of-the-art pilot scale processing unit operations, including facilities for biomass handling, storage and pre-treatment, enzyme treatment, aerobic and anaerobic fermentation (100-300L), thermochemical conversion, product separation and recovery, process integration, sensor technology and additional technologies for analysis of biomass cell structure and composition. Such a facility will allow scientists to investigate the scalability of new technologies showing promise at the lab bench level. Improving efficiency and lowering the costs of bioprocessing for the production of biofuels and chemicals and the development of new bioprocessing methods to more efficiently create products from biomass other than corn and soybeans will be made possible. Future leaders in the bio-based economy will be trained in the IBRL.

"I believe that the IBRL will provide the ability to model and physically test the integration of different feedstocks, pre-treatment processes, enzyme hydrolysis conditions and fermentation processes for the production of second generation biofuels and high value co-products. The industry has a very limited number of public facilities that can reliably and economically perform that type of testing, and certainly none exist in the state of Illinois. A facility such as this would be helpful to us in scaling up our lab scale enzymatic hydrolysis processes using industry accepted pilot-scale feedstock pre-treatment and ethanologen conditions. With corn ethanol peaking out, global demand for energy and food escalating at the fastest rate in history, the need for second generation biofuels and high value co-products is certainly here to stay." Bob Randle, Genencor

<http://bioenergy.illinois.edu>

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Architectural rendition of the Integrated Bioprocessing Research Laboratory at the University of Illinois.

