435g Evaluation of Fungal Growth Kinetics and Organic Acid Production Using Chemostats

Chris F. Wend, Andy J. Zwoster, Danielle L. Wharton, and Mark G. Butcher

The biorefinery concept seeks to add value to the fuel generation process through conversion of by-products to value added products, such as chemical feedstocks. Specifically, more economical methods of converting renewable plant-derived biomass first to sugars, then to fuels and chemicals are needed. Fermentation processes will be a critical component of producing the enzymes needed for hydrolysis of biomass and the products from the resulting sugars.

Fermentations by filamentous fungi represent some of the most successful processes in existence. Therefore, it is critical that we understand the fundamental mechanisms controlling morphology and product output in fungi to accelerate future contributions to the biotechnology of biomass conversion by this important kingdom of organisms. Development of a fungal chemostat capability at Pacific Northwest National Laboratory has been an important component of accelerated filamentous fungal research.

This presentation will discuss the use of chemostat techniques to not only evaluate growth and product kinetics but establish equilibrium growth conditions for genomic and proteomic analyses. Specific examples will be presented using simple and complex biomass substrates.