

Enabling robust production of biorenewable fuels and chemicals from biomass

Laura R. Jarboe*, Liam Royce, Ping Liu, Tao Jin

Department of Chemical and Biological Engineering, Iowa State University

3051 Sweeney Hall, Ames, IA 50011

ljarboe@iastate.edu

Overcoming biocatalyst inhibition, whether by the target metabolic product, the substrate of interest, or contaminants in the feedstock, is a significant challenge for cost-effective production of biorenewable fuels and chemicals from lignocellulosic biomass. Rational engineering efforts can be employed when the mechanism of inhibition is known, where omics analysis can be used to identify the mechanism. Contrastingly, reverse engineering of evolved strains can also reveal the mechanism of inhibition. This talk describes examples of both approaches involving production of inhibitory products, such as short-chain carboxylic acids, and the use of cheap (“dirty”) biomass-derived substrates, such as pyrolytic sugars and furfural-contaminated biomass hydrolysate.