

Title

Investigating Lignin Modifying Enzymes and their Synergistic Effect with Ionic Liquid Pretreatment

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Deconstruction

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Project Goals

Biomass recalcitrance is a function of the plant's state of polymerization of various polymers, including sugars and lignin, the interactions among these polymers and their crystallinity. Extracting the valuable sugars and aromatics from biomass requires harsh chemical and thermal pretreatment. We hypothesized that by first breaking down lignin using laccases, the severity and thus the expense of the pretreatment process can be reduced and evaluated the synergistic effect of Lignin-Modifying Enzymes (LME's) and ionic liquid pretreatment on glucose yields and reducing the amount of other enzymes required.

Further LME engineering may enhance the rate of lignin breakdown to monomers for fuels or chemicals.

Depolymerization of lignin and subsequent valorization and enhancement of saccharification and reducing the overall cost of 2nd and 3rd generation biofuels by reducing required enzyme loading and cost.

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