

## **Identifying a Minimal Set of Genes Required for Valorization of Lignin Biomass**

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**Project Goals:** This research project focuses on 1) the expression and characterization of lignin-degrading enzymes sourced from white-rot fungal genomes in a heterologous host, and 2) their combinatorial application to recapitulate and better understand lignin degradation in a synthetic context.

Lignin is the second-most abundant biopolymer in the world, but efforts to break it down into useful carbon-based platform chemicals in a reliable and scalable manner have been thus far largely unsuccessful, rendering lignin substantially underutilized. By contrast, fungi readily degrade and metabolize this recalcitrant biopolymer using a milieu of specialized enzymes. Reconstituting the lignin-degrading machinery of white-rot fungi in a genetically-tractable model organism may therefore enable a route to efficient valorization of lignin biomass. In this poster, I will present our efforts involving expression of putative lignin-degrading enzymes in yeast and plant heterologous hosts, as well as a combinatorial biochemical approach to develop an enhanced understanding of the interconnected roles of putative ligninases in degrading lignin biomass.

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