

Catalytic promiscuity in lignin degrading peroxidases for hydrolysis and degradation of lignocellulosic substrates

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Cellulose is the structural component of cell wall in plants and the most abundant carbon sources in nature. Recently, its degradation to sugars is one of important topics in biorefinery. Hence, discovery of a stable and/or multifunctional biocatalyst with cellulase activity is very useful for an efficient degradation of cellulose to glucose in the biorefinery process.

Herein, we reported a novel catalytic promiscuity in lignin degrading peroxidases (lignin peroxidase and manganese peroxidase) from Phanerochaete chrysosporium for degradation of cellulosic substrates. Using hydrogen peroxide as the electron acceptor, lignin peroxidase catalyzed degradation of not only lignin but also cellulosic substrates such as cellobiose, carboxymethyl cellulose, *p*-nitrophenyl cellobioside. Consequently, lignin peroxidase was a multi-functional biocatalyst with exocellulase, endocellulase, and β -glucosidase activities. Optimum conditions for cellulosic substrates exocellulase were characterized respectively. The results about manganese peroxidase will be presented later.