Natural and Synthetic Oxidoreductases In Cellulose Hydrolysis

Barbara R. Evans[1], Jonathan Woodward[1], and Valerie P. Malyvanh[2]

[1]Chemical Technology Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6194

[2]Maryville College
Maryville, TN 37804-0005

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ABSTRACT

In order to efficiently hydrolyze lignocellulosic substrates, fungi secrete oxidoreductases such as laccase, cellobiose quinone oxidoreductase, and lignin peroxidase that depolymerize lignin, thus enabling fungal cellulases to hydrolyze the cellulose. Synthetic constructs were designed to mimic the naturally occurring oxidoreductases by coupling of redox groups to cellulose binding domains and other proteins. The effects of combinations of the natural and synthetic constructs on the hydrolysis of samples of lignocellulosic substrates by fungal and bacterial cellulases were compared.