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Binding and Hydrolysis Properties of Engineered Cellobiohydrolases and Endoglucanases

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Abstract

Because cellulase was the main enzyme used in bioconversion of lignocellulose, it was a valid way to reduce the hydrolysis cost by increasing the adsorption and hydrolysis efficiency of cellulase. In this study, modified cellobiohydrolases (CBHs) and endoglucanases (EGs) were constructed. Two engineered cellulases $CBH-TrCBM^{V27E,P30D,Link1}$ and $EG-TrCBM^{V27E,P30D,Link1}$ performed well during hydrolysis. Compared to wild-type enzymes, $EG-TrCBM^{V27E,P30D,Link1}$ obtained relatively less adsorption ability to lignin and greater affinity to cellulose, especially Avicel. However, for $CBH-TrCBM^{V27E,P30D,Link1}$, the hydrolysis manner was changed and in favor to hydrolysis process, although the adsorption properties were unexpected. It suggested that various binding conformations of polysaccharide on CBMs hypothetically resulted in different functions of CBMs, including binding

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