

Improved biomass degradation using fungal glucuronoyl-esterases-hydrolysis of natural corn fiber substrate - DTU Orbit (08/11/2017)

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Lignin-carbohydrate complexes (LCCs) are in part responsible for the recalcitrance of lignocellulosics in relation to industrial utilization of biomass for biofuels. Glucuronoyl esterases (GEs) belonging to the carbohydrate esterase family 15 have been proposed to be able to degrade ester LCCs between glucuronic acids in xylans and lignin alcohols. By means of synthesized complex LCC model substrates we provide kinetic data suggesting a preference of fungal GEs for esters of bulky arylalkyl alcohols such as ester LCCs. Furthermore, using natural corn fiber substrate we report the first examples of improved degradation of lignocellulosic biomass by the use of GEs. Improved C5 sugar, glucose and glucuronic acid release was observed when heat pretreated corn fiber was incubated in the presence of GEs from *Cerrena unicolor* and *Trichoderma reesei* on top of different commercial cellulase/hemicellulase preparations. These results emphasize the potential of GEs for delignification of biomass thereby improving the overall yield of fermentable sugars for biofuel production.

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