Construction of a vector for fermentation of cellodextrin derived from lignocellulosic biomass by industrial strains of *Saccharomyces cerevisiae.*

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Currently, ethanol is produced from corn starch and sucrose from sugar cane, but large gains in efficiency would be possible with the use of lignocelulosic biomass. In order to be used, this biomass needs to pass through pre-treatment and enzymatic hydrolysis steps that can be costly. One way to reduce these costs would be to develop microorganisms that can utilize lignocelulosic hydrolysates to fermentation.

A cellodextrin-fermenting strain of *Saccharomyces cerevisiae* was already developed (Galazka, 2010, *Science*, **330**, 84), using genes that encode cellodextrin transporters and an intracellular β-glucosidase from *Neurospora crassa*. However, a laboratory strain of *S. cerevisiae* was used, less productive and sturdy than an industrial strain. With the objective of obtaining a cellodextrin-fermenting yeast strain, that has the characters required to survive in an industrial environment, the genes utilized by Galazka *et al.* will be integrated into the genome of an industrial strain.

To obtain the genes' coding sequences, *N. crassa* was grown in a medium with cellulose as the sole carbon source for total RNA extraction and posterior synthesis of cDNA. The genes were amplified from cDNA by PCR and will be fused to *S. cerevisiae* promoters and terminators through double-joint PCR. A vector containing both genes and an auxotrophic marker was constructed for integration into the industrial strain´s genome. This vector will enable the expression of cellodextrin transporter and intracellular β-glucosidase from *N. crassa*, giving the yeast the ability to perform the fermentation of sugars derived from the hydrolysis of cellulose.

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