

EXPLOITABLE FOREGROUND

A specific Xylose Transporter evolved by using a newly developed yeast-based screening system

Explanation and Purpose

GUF has developed a new screening system for improved xylose utilisation of yeast strains in the presence of glucose. GUF has constructed a hexokinase/hexosetransporter-deficient recombinant yeast strain which is no longer able to utilise glucose, but expresses a xylose utilisation pathway. In this strain single sugar transporters with limited specificity for xylose have been expressed. However, in the presence of glucose, xylose cannot be transported by the sugar transporter as glucose inhibits nearly all sugar transporters. Suppressor mutants/mutations are being selected which enable the strain to utilise/ferment xylose even in the presence of increasing concentrations of glucose. Most of these mutations will concern the uptake of xylose into the yeast cells in the presence of glucose. This will result in the engineering of a specific xylose transporter which is no longer inhibited by glucose.

Exploitation Strategy

The screening system and the evolved xylose transporters will be offered to companies developing yeast cells for the fermentation of mixed-sugar hydrolysates. Furthermore, the xylose transporters will be expressed in the industrial C5-sugar fermenting yeast strains of the NEMO project in order to improve simultaneous glucose and xylose fermentations.

IPR Measures

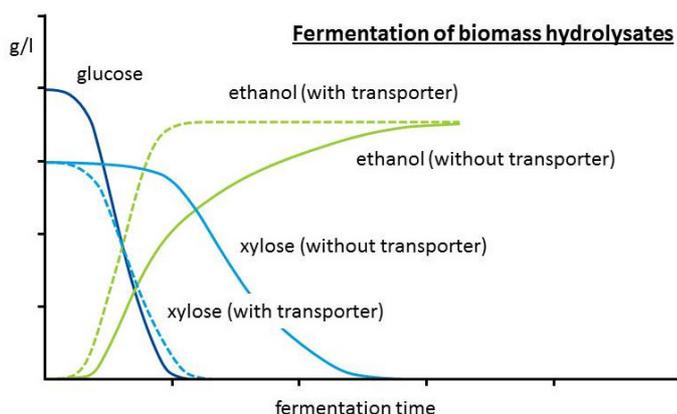
A patent application is planned concerning the evolved xylose transporters.

Further Research

Construction of the screening strain has been finished. Various sugar transporters have been expressed and are being evolved for growth on xylose in the presence of increasing concentrations of glucose. One xylose transporter which is no longer inhibited by glucose has already been identified.

Impact of Exploitation

The improved xylose transporters will enable yeast strains to ferment xylose simultaneously with glucose. This will significantly reduce the time for the complete fermentation of lignocellulosic hydrolysates and will therefore reduce the production costs for lignocellulosic ethanol.



Novel Microbes and Enzymes for 2nd Generation Bioethanol Production



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