EXPLOITABLE FOREGROUND

Robust xylose fermenting industrial yeast strain for bioethanol production

Explanation and Purpose

A robust industrial yeast strain has been developed that efficiently converts xylose into ethanol. The strain was developed by mutagenesis and multiple rounds of evolutionary engineering, including genome shuffling, from an Ethanol Red strain expressing a bacterial Xylose Isomerase. Further improvements were introduced by targeted genetic engineering using superior allele tools for improvement of complex traits. The new strain efficiently produces ethanol close to theoretical maximum yield from both hexoses and xylose in lignocellulose hydrolysates.

Exploitation Strategy

The strain is under pilot scale evaluation by academic partners and by several bioethanol companies. VIB provides licenses to companies for evaluation and commercialization of the strain as well as research collaboration for further improvement of the strain depending on the substrates, process conditions and other needs of the company. For that purpose, VIB has a portfolio of advanced genomic technologies and superior allele tools as well as extensive know-how for efficient engineering of industrially-important polygenic traits in yeast.

IPR Measures

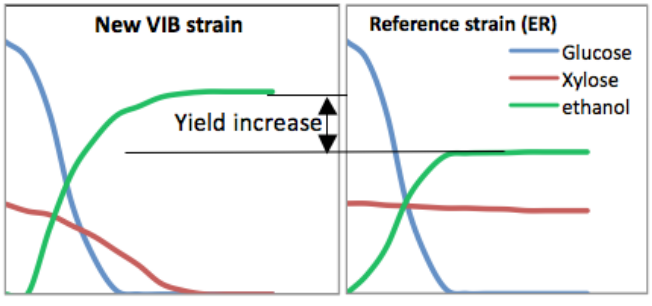
Patent applications have been filed on specific genetic modifications introduced in the strain and a patent application will be filed on the strain itself and its use for bioethanol production with lignocellulose hydrolysates.

Further Research

The strain is being improved further for maximal tolerance to various stress conditions and for maximal productivity in concentrated lignocellulose hydrolysates made with different substrates.

Impact of Exploitation

With the present yeast strain, up to 30% increase in the yield of ethanol can be obtained in lignocellulosic biomass fermentation. This will have a significant impact on the economic feasibility of advanced bioethanol production.



Typical fermentation profile in lignocellulosic substrate by the new VIB strain compared to the reference strain, showing the increase in yield of ethanol due to xylose fermentation

Novel Microbes and Enzymes for 2nd Generation Bioethanol Production

NEMO for bioethanol

Contact for Exploitable Result:

Department of Molecular Microbiology, KU Leuven, Belgium (VIB)
Prof. Dr. Johan Thevelein
johan.thevelein@mmbio.vib-kuleuven.be

Project Coordination:

VTT Technical Research Centre of Finland
Prof. Merja Penttilä
merja.penttila@vtt.fi

Project Dissemination:

WIP – Renewable Energies, Germany
Dr. Rainer Janssen
rainer.janssen@wip-munich.de

NEMO Website: http://nemo.vtt.fi

SEVENTH FRAMEWORK PROGRAMME

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