I10. Industrial and Food Microbiology and Biotechnology

P327. Arabitol production from lignocellulosic biomass through GRE3-overexpressing industrial *Saccharomyces cerevisiae* strains

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Arabitol is a five carbon sugar alcohol that belongs to the pentitol family, the same of xylitol and ribitol, being one of the top 12 biomass-derivable building block chemicals. Due to its sweetness similar to glucose and low caloric content (0.2 kcal/g) it is used as an alternative sweetener in food industry [1].
The concerns about the depletion of fossil fuel reserves and the economic and environmental problems associated with their use have led to the search of renewable energy sources. Lignocellulosic biomass emerged as sustainable alternative for the production of value-added products, once lignocellulose is one the most abundantly renewable biomass available on earth. Thus, the development of a lignocellulose-based bioeconomy must compromise the valorisation of lignocellulosic biomass for the production of value-added products [2].
Currently, arabitol is industrially produced by chemical reduction of lactones [3]. However, bioconversion of sugars present in lignocellulosic biomass to arabitol could be a viable alternative to chemical production. An endogenous aldose reductase from *Saccharomyces cerevisiae*, with a broad substrate specificity, was previously reported to be able to convert xylose and arabinose to xylitol and arabitol, respectively [4,5].
In here, we demonstrate the feasibility of using an engineered yeast strain overexpressing an aldose reductase gene for the conversion of arabinose to arabitol. Due to the unspecificity of the enzyme, arabinose and xylose could be simultaneously converted to arabitol and xylitol, respectively, which can lead to the development of a multi-chemical yeast production platform, contributing to the establishment of a lignocellulose-based bioeconomy.

References
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