ENGINEERING SACCHAROMYCES CEREVISIAE FOR THE PRODUCTION OF SUGAR ALCOHOLS

Environmental and industrial biotechnology (Bioenergy, bioremediation)

OP - (788) - ENGINEERING SACCHAROMYCES CEREVISIAE FOR THE PRODUCTION OF SUGAR ALCOHOLS

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Body

Excess sugar intake contributes to weight gain, obesity, and related diseases [1]. Considering the growing demand for healthier products, most food manufacturers are focused on the reformulation of foods and beverages to reduce added sugar, using natural sweeteners and combinations of these ingredients. Arabitol is a sugar alcohol presenting similar properties to its isomer xylitol, a well-established sugar substitute [2]. The microbiological production of these sugar alcohols has received growing interest as an alternative to the expensive chemical synthesis that involves negative environmental effects. The yeast *Saccharomyces cerevisiae* considered a platform cell factory for sustainable biorefineries [3], encodes in its genome an NADPH-dependent aldose reductase that converts aldoses into their corresponding alcohols [4]. Taking advantage of its broad substrate specificity, we demonstrate the feasibility of using an engineered industrial yeast strain for the simultaneous conversion of arabinose and xylose to arabitol and xylitol. In addition, the recombinant strain was further engineered to improve arabinose transport capacity, improving the arabinose to arabitol conversion yield. This strategy for the simultaneous production of sugar alcohols is a step forward in the development of a multi-chemical yeast production platform capable to convert bulk sugars present in agro-food residues, contributing to the establishment of a bioeconomy.

Acknowledgements

This study was supported by the Portuguese Foundation for Science and Technology (FCT) - UID/BIO/04469/2020 unit; Ph.D grant SFRH/BD/132717/2017 to Sara L. Baptista and Ph.D. grant SFRH/BD/146367/2019 to Pedro O. Soares This study was also supported by BioVino project (0688_BIOVINO_6_E), funded by INTERREG España - Portugal and European Regional

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Palavras-chave : arabitol, xylitol, Saccharomyces cerevisiae