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**Photo-immobilization of invertase on amyloid nanofibers for the design of a solid nanocatalyst for the production of inverted syrup**

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The external invertase enzyme ( $\beta$ -fructofuranosid fructohydrolase, EC3.2.1.26) obtained from yeast *Saccharomyces cerevisiae* is of great importance in the food and beverage industry. This enzyme is used to catalyse the conversion of sucrose to an equimolar mixture of glucose and fructose. The aim of this study was to design a solid nanocatalyst throughout photo-induced immobilization of the enzyme invertase on the amyloid nanofibrils for technological applications.

Lysozyme was used to produce the support applying the protocol of the patent WO-2014006560-A2. Spectroscopic fluorescence and transmission electron microscopy confirmed the success in formation of amyloids nanofibers.

The enzymatic immobilization into this support was attained through photocrosslinking. Several experimental conditions were assayed (temperature, pH, irradiation time, concentration of reagent, presence of detergents, etc) to optimize the reaction. The performance of the immo-

bilization protocol was increased from 0.006 to 4.24 UE/ml once the optimal conditions were reached. The kinetic parameters and stability were determined for the free and immobilized invertase, showing that the stability, the optimal pH and temperature of the enzyme were not altered upon immobilization. The immobilized biocatalyst also showed high operational stability, capable to be reused up to 10 batches with only 40% decrease in activity.

Results indicate that fibrils obtained by low cost modifications can be applied as a suitable support for the immobilization of invertase. This nanobiocatalyst could be efficiently engaged in sucrose hydrolysis in batch reactor