SELECTION OF MATERIALS WITH POTENTIAL FOR IMMOBILIZATION OF THE FUNGUS PENICILLIUM EXPANSUM DURING THE SUCROSE FERMENTATION

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Background: Several advantages have been reported for the use of immobilized cells in fermentative processes, including increased cell stability that may often result in increased cell productivity[1]. In addition; the easier separation of the cells from the fermentation broth allows repeated batch operations and facilitates isolation and purification of the products. Nevertheless, good performance of systems based on immobilized cells mainly depends on the right selection of the immobilization carrier.

Objective: The aim of this work was to evaluate the potential of different low-cost materials as carrier for immobilization of the fungus *Penicillium expansum* during the sucrose fermentation to fructooligosaccharides (FOS).

Methods: Five different materials (polyurethane foam, stainless steel sponge, vegetal fiber, cork oak, and loofa sponge) were tested as carrier for immobilization of *P. expansum* (MUM 02.14) during the sucrose (200 g/l) fermentation to FOS, for 48 h. Cells were immobilized by absorption, through direct contact with the carrier particles.

Results: Vegetal fiber was the best immobilization carrier as *P. expansum* grew well on it (2.26 g/g carrier). In addition, no loss of material integrity, over a 2 day-period, was found. The fungus immobilized in less extends in the other evaluated materials: polyurethane foam 1.87 g/g, stainless steel sponge 1.34 g/g, cork oak 0.18 g/g, and loofa sponge 0.05 g/g.

Conclusions: Vegetal fiber is a material with great potential to be used as cell immobilization carrier during the sucrose fermentation by *P. expansum*. It was thus selected for future use in repeated batch fermentations of sucrose to FOS by this microorganism.

References: 1 Fenice M, Giambattista RD, Raetz E, Leuba J-L, Federici F, Repeated-batch and continuous production of chitinolytic enzymes by *Penicillium janthinellum* immobilized on chemically-modified macroporous cellulose. Journal of Biotechnology (1998), 62, 119-131