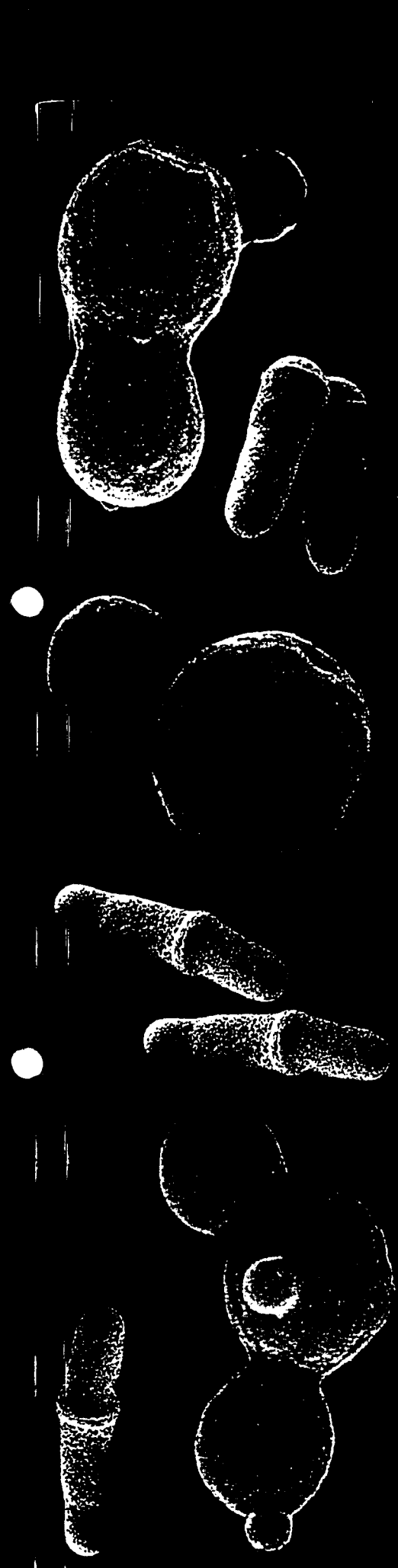

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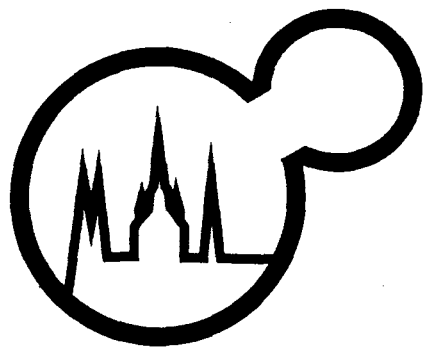

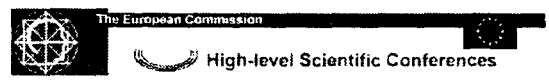

BOOK OF ABSTRACTS

D. Fisk and A. Pichová (Editors)

16 - Biotechnology and Industrial Applications

- 16-35

Continuous beta-galactosidase production by transformed flocculent *Saccharomyces cerevisiae* cells growing on lactose.

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High cell density systems are usually associated with higher productivity, better cell-liquid separation and higher resistance to contaminations. In addition, the use of flocculating yeast cells in high cell density systems is economically attractive as there is no need for a support. In this work, the applicability of these systems for the production of an extracellular heterologous protein - beta-galactosidase - is shown. In this study, the flocculating *S. cerevisiae* NCYC869-A3 strain transformed with pVK1.1 plasmid producing extracellular beta-galactosidase was used. Batch experiments confirmed cheese whey permeate as a feasible substrate for beta-galactosidase production. The continuous high cell density operation, using a semi- synthetic medium allowed for beta-galactosidase productivity 6 times higher than the one obtained with the batch system. The higher beta-galactosidase productivity was obtained at 0.24 h^{-1} and 0.18 h^{-1} dilution rate for the bioreactor fed with 50 gl^{-1} lactose and 100 gl^{-1} lactose, respectively. However, defflocculation problems arose when operating with cheese whey permeate.This study clearly indicates the potentialities of the application of continuous high cell density bioreactors to protein secretion by flocculating yeast cells. The authors acknowledge the financial support by the IBQF, Portugal. Lucília Domingues was supported by a grant (PRAXIS XXI/BD/11306/97) from FCT, Portugal.