



Development of bioprocesses involving non-conventional yeasts

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Yeasts are an attractive group of lower eukaryotic microorganisms, some of which are used in several industrial processes that include the production of a variety of biochemical compounds. Due to knowledge of the complete genomes sequence of *S. cerevisiae* and *S. pombe*, these yeasts have been most used over the last decades, but an increasing number of alternative non-*Saccharomyces* yeasts have now become accessible for a diverse range of research proposes due to the rapid development of molecular techniques together with biochemical approaches.

Y. lipolytica is one of the more intensively studied non-conventional yeast species. As it is considered as non-pathogenic, GRAS and can use a wide range of substrates such as alkanes, fatty and organic acids, glycerol, proteins and some sugars, this yeast presents a great interest for many applications [1].

Most of the actual projects in course in our laboratory have been focused in this yeast, mainly: optimization of a peach-like aroma compound production by the biotransformation of castor oil; optimization of lipase production; and valorization of agro-industrial sub-products like olive mill wastewater by producing high-value compounds while degrading this waste [2]. Oxygen transfer rate in the bioprocesses has been one of the major factors of interest for optimization. A deep study of this phenomenon in biphasic media (oil-in-water emulsions) is been carried out. Other approach of OTR enhancement has been the use of increased air pressure while the physiological response of yeasts to this stress factor has been characterized. Other non-conventional yeasts have also been studied and compared with *Y. lipolytica*.

[1] Fickers, P.; Benetti, P.-H.; Waché, Y.; Marty, A.; Mauersberger, S.; Smit, M. S.; Nicaud, J.-M. "Hydrophobic substrate utilisation by the yeast *Yarrowia lipolytica*, and its potential applications". *FEMS Yeast Research*. (2005) **5**:527-543.

[2] Lopes, M., Araújo, C., Aguedo, M., Gomes, N., Gonçalves, C., Teixeira, J.A., Belo, I. "The use of olive mill wastewater by wild type *Yarrowia lipolytica* strains: medium supplementation and surfactant presence effect". *J. Chem. Technol. Biotechnol.* (2008) **84**:533-537