

## New Opportunities of Biocatalysis in Industrial Biotechnology

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Chemical products continue to have vital importance to the world economy and are essential to the health, food and consumer product industries. However, they led to environmental damage and a low public perception of chemical industry. For that reason, there is increasing pressure from both society and Governments for development of new industrial processes to become more sustainable, reducing waste and preventing the use of toxic substances. Consequently, there is a huge opportunity for research and implementation of new cleaner and green processes in the field of industrial biotechnology namely Biocatalysis and Biotransformation.

Within this scope, Luis P. Fonseca has focus his research interests on application of biocatalysis in green processes, and development and implementation of reaction media using basically water due to higher enzyme stability and also increasing environment concerns. The design of oil-in-water emulsions (also named miniemulsions) have allowed the production of a high range of high-value products from flavors and fragrances, emollients, polymers, nutraceuticals, and specialty and fine chemicals that led to the development of *Aromase technology*. This technology is characterized by the enzymatic catalysis, utilization of renewable material resources, high energetic efficiency, no toxicity by using reactions based in water, prevention of waste and sub-products,, among many others advantages.

Later modification of the miniemulsion composition evolved to *NanoLipCar technology* with main goal to design and processing of new drug delivery carriers for encapsulation of cosmeceuticals, nutraceuticals and pharmaceuticals at form of Lipid Nano-Emulsions (LNEs) and Lipid Nano-Particles (LNPs) in this last using long fatty acids that solidify at higher than 37°C.

### Biography:

Luis P. Fonseca is, Associate Professor with Habilitation and Ph.D. of Department of Bioengineering at Instituto Superior Técnico (I.S.T.) of University of Lisbon (U.L.), Portugal and Senior Research Scientist (PI) at the Institute for Bioengineering and Bioscience (IBB) at I.S.T. His prior positions included Chemical Engineer at Hovione, Lda (1985-1986), a Visiting Researcher at CIPAN, Lda (1987-1988), Post-Doc at The School of Biochemistry and Molecular Biology, University of Leeds (1997-1998), Visiting Scholar at Chemical Engineering Department, University of California, Berkeley (2004-2005), and at Institute of Chemistry at University Federal of Rio Grande do Sul, Brazil (2011-2012) and Sao Carlos at University of Sao Paulo, Brazil (2015 and 2017).