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Yarrowia lipolytica: A novel system for biosimilar production

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Recombinant protein production is a multi-billion dollar market, comprising biopharmaceuticals and industrial enzymes. Narious heterologous systems are available for protein production; each system has its own advantages and limitations. In contrast to bacteria, yeasts have a great secretion potential including a strict quality control with the ability to perform complex post transcriptional modification. The non conventional *Y. lipolytica* yeast appears as an attractive system for protein production. It is considered as non pathogenic and "generally regarded as safe" (GRAS) microorganism. Another important feature of *Y. lipolytica* as a host is the convenience of its secretory apparatus; high efficiency, co-translational pathway and low over glycosylation, in some regards are closer to that of mammalian cells than to those of many yeast.

In our laboratory, we studied the expression of two therapeutic proteins of great interest: human interferon alpha 2b and the human granulocyte macrophage-colony stimulating factor (huGM-CSF) in *Y. lipolytica*. In the presentation, optimization of the expression level at the molecular level will be highlighted. Contrary to the *Ppastoris*, standard protocols for high cell density cultivation are not available for *Y. lipolytica*. Therefore, we will present our data describing the development of an efficient medium for heterologous protein production in this yeast, as well as the set up of fermentation strategies to maximize the production of the protein of interest that are amenable for scale up. Biological activities of the expressed proteins will be also shown.

Biography

Hela Kallel is currently a senior scientist at Institut Pasteur de Tunis. She is in charge of the Bioprocess development group within the laboratory of Molecular Microbiology, Vaccinology and Biotechnology Development. The group headed by her has a number of on-going projects whose objectives are to develop novel processes with a high yield, to produce biologicals at an affordable cost for developing countries. The group is focused on the development of viral vaccines and biosimilars using novel expression systems. She holds a Ph.D. degree in Biotechnology. She graduated from Institut National Polytechnique de Lorraine (Nancy, France). She is member of several scientific societies and has around thirty five international publications.

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