

Press release



Microbial enzymes used to produce more sustainable detergents, textiles and cosmetics

FuturEnzymes project starts 01 June 2021: Technologies of the Future for Low-Cost Enzymes for Environment-Friendly Products

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CLIB2021

The FuturEnzyme project will achieve greener, more innovative and sustainable detergents, textiles, and cosmetics with enzymes.

- Its objective is to replace or reduce the use of chemical agents with microbial enzymes that can be incorporated in the manufacture of commercially available products.
- The addition of enzymes to detergents, as well as the processing of textiles and cosmetics with enzymes, can reduce CO₂ emissions by 42 million tons per year.

This European project will develop new microbial enzymes that can be used to create consumer products (textiles, detergents and cosmetics) that are more environmentally friendly. The project, called FuturEnzyme, started this week and has a funding of almost six million euros from the Horizon 2020 framework program.

Detergents, textiles, and cosmetics are basic goods of daily use with complex formulas that can damage the environment and generate a very high impact on CO₂ emissions, in addition to the consumption of large amounts of energy, water and the discharge of chemical products into the environment. One of the most promising ways to alleviate this problem is based on substituting the chemical agents used in industrial processes by enzymes to generate these products. Their use in liquid detergents, as well as in the processing of textiles and cosmetic ingredients, could reduce CO₂ emissions by 42 million tons per year, according to recent estimates.

Although enzymes that cover these activities already exist on the market, less than 10% of current consumer products contain enzymes, either because of their high cost or low performance. *"Current enzymes cannot cope with the formulation of higher environmental quality consumer products. It is crucial to design smart technologies based on a new generation of enzymes with higher activity, stability and lower cost, which can meet the demands of both consumers and industry,"* points Manuel Ferrer, CSIC researcher at the Institute of Catalysis (ICP-CSIC) and coordinator of the project.

To achieve this, FuturEnzyme's multidisciplinary consortium will start with detergents, cosmetics, and sportswear already available on the market. *"We want to make sure that the enzymes can be incorporated into the production process, harnessing biotechnology to make existing products more environmentally friendly, functional and sustainable",* adds Tatjana Schwabe-Marković from CLIB. *"We are happy that our CLIB members Henkel and Evonik are among the industry partners in the project, eager to apply the novel enzymes in their processes. Other CLIB members are the University of Düsseldorf and Inofea who contribute their important scientific and technical know-how to optimise enzymes and immobilise them for biocatalysis."*

These enzymes will be extracted from microorganisms by applying techniques that allow rational selection of the most suitable enzymes at each moment and for each product. The technology will combine massive analysis of biological data using supercomputers, bioprospecting, protein engineering, biotechnology and pre-industrial testing to select the best enzymes from thousands or millions of enzymes, something that has not been possible to date.

The FuturEnzyme multidisciplinary consortium is composed of 16 European academic and industrial partners from Spain, Germany, Italy, Austria, Portugal, United Kingdom and Switzerland. CLIB will lead the collaboration between scientific development and industrial application in the project. FuturEnzyme will run until 2025. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000327.

CLIB – Cluster Industrial Biotechnology is an international open innovation cluster for bioeconomy with a focus on industrial biotechnology. The approximately 100 cluster members are large (multinational) companies, SMEs, universities, academic institutes as well as other stakeholders active in the bioeconomy. Founded in 2007, CLIB has almost 15 years of experience in connecting stakeholders along and across value chains; in helping to set up project consortia, in developing tech transfer strategies, in providing policy advice and in promoting industrial biotechnology as a key driver for a sustainable bio- and circular economy.

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