FuturEnzyme. Technologies of the FUTURe for low-cost ENZYMEs for environment-friendly products

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FuturEnzyme project

The FuturEnzyme consortium is organised with a clear objective: to establish and combine a series of technologies (including digital ones) to develop **enzymes at low cost** and with **exquisite performance and stability**.

FuturEnzyme project has the ambition to develop at least nine enzymes to be implemented **in real consumer products**, particularly liquid detergents, textiles and anti-ageing ingredients for cosmetics, making them more **environmentally friendly, valuable, functional and sustainable.**

Who will benefit?

WHO WILL BENEFIT?

Consumers, because they will have products that have been processed according to ecological principles and with better and/or new properties (e.g. better washability, **better anti-ageing properties**, greener fabrics, etc.)

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Companies, as having greener innovative products will allow opening up **new markets and gain better visibility**

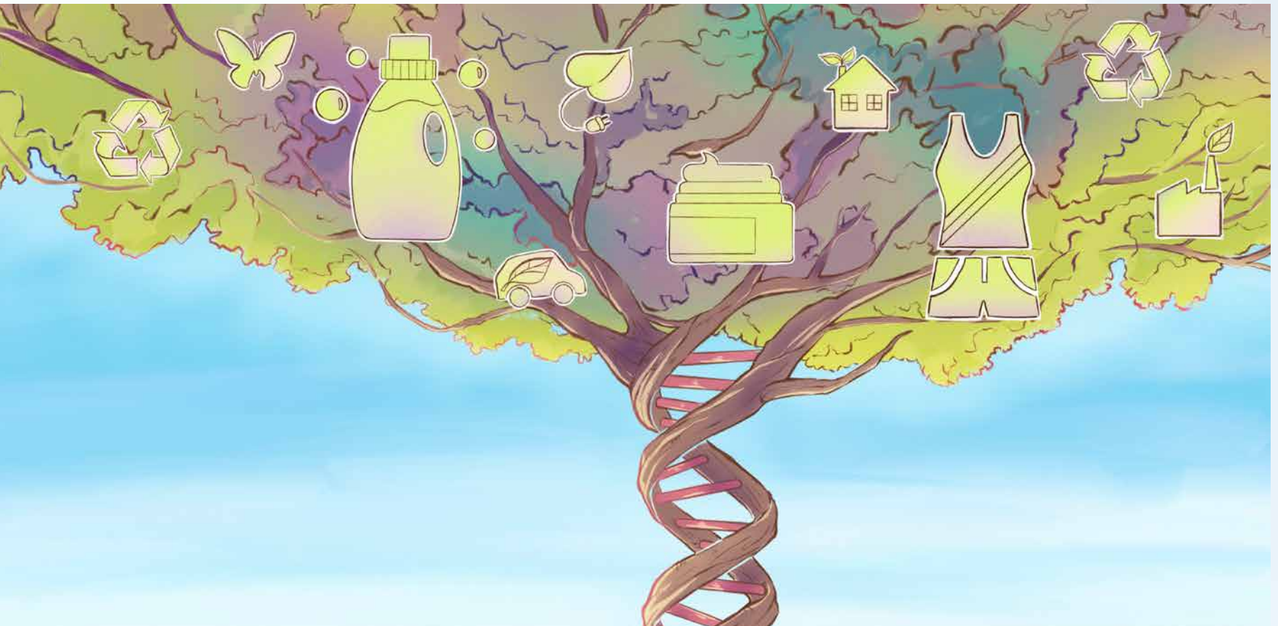
The planet, as greenhouse gas impacts, water and energy consumption, and chemical releases will be substantially reduced, thus contributing at least to **climate change mitigation, pollution prevention, protection and recovery of biodiversity and ecosystems and circular economy**.

Expected impacts of FuturEnzyme for consumers and the environment

The tools, enzymes, and products to be implemented in FuturEnzyme will help increase the number of eco-conscious consumers, currently accounting for about 50% of the Europeans.

How will FuturEnzyme achieve benefits?

HOW WILL FUTURENZYME ACHIEVE BENEFITS?



Detergent sector:

by integrating more efficient and stable enzymes with a double aim. First, to **decrease the amount of chemicals** used in detergents, which are released into the environment after the washing cycle. Second, increasing the percentage of **low washing temperature** (20-40˚C) can almost halve the energy consumption of a standard washing cycle. To reach this goal, our industrial partner requested enzymes active against stubborn stains and stable under washing and storage conditions

Cosmetic sector:

by focusing on hyaluronic acid, a very large natural polymer that has limited biological anti-ageing activity because of its big size and low penetration into the skin. Cleaving the large anti-ageing ingredient is essential to improve its activity but the existing technologies like thermal degradation are unsuitable, forming very short fragments that are not appropriate as cosmetic ingredients. The project's ambition is, therefore, to develop enzymes which allow to generate **hyaluronic acid fragments with a desired size in a production process running at low temperatures and show a more effective anti-ageing activity**

Textile sector:

by integrating efficient enzymes in the manufacturing steps of textiles and ensuring a more environmental friendly process from yarn to garments and to develop **smart textiles which have additional benefits for consumers**. In these steps many chemicals are employed, that need to be eliminated at the end of each of the processing steps. Thus enzymes take over the role of chemicals resulting in a positive environmental impact.

Partners

Prifysgol Bangor University

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

BioChemSolutions

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