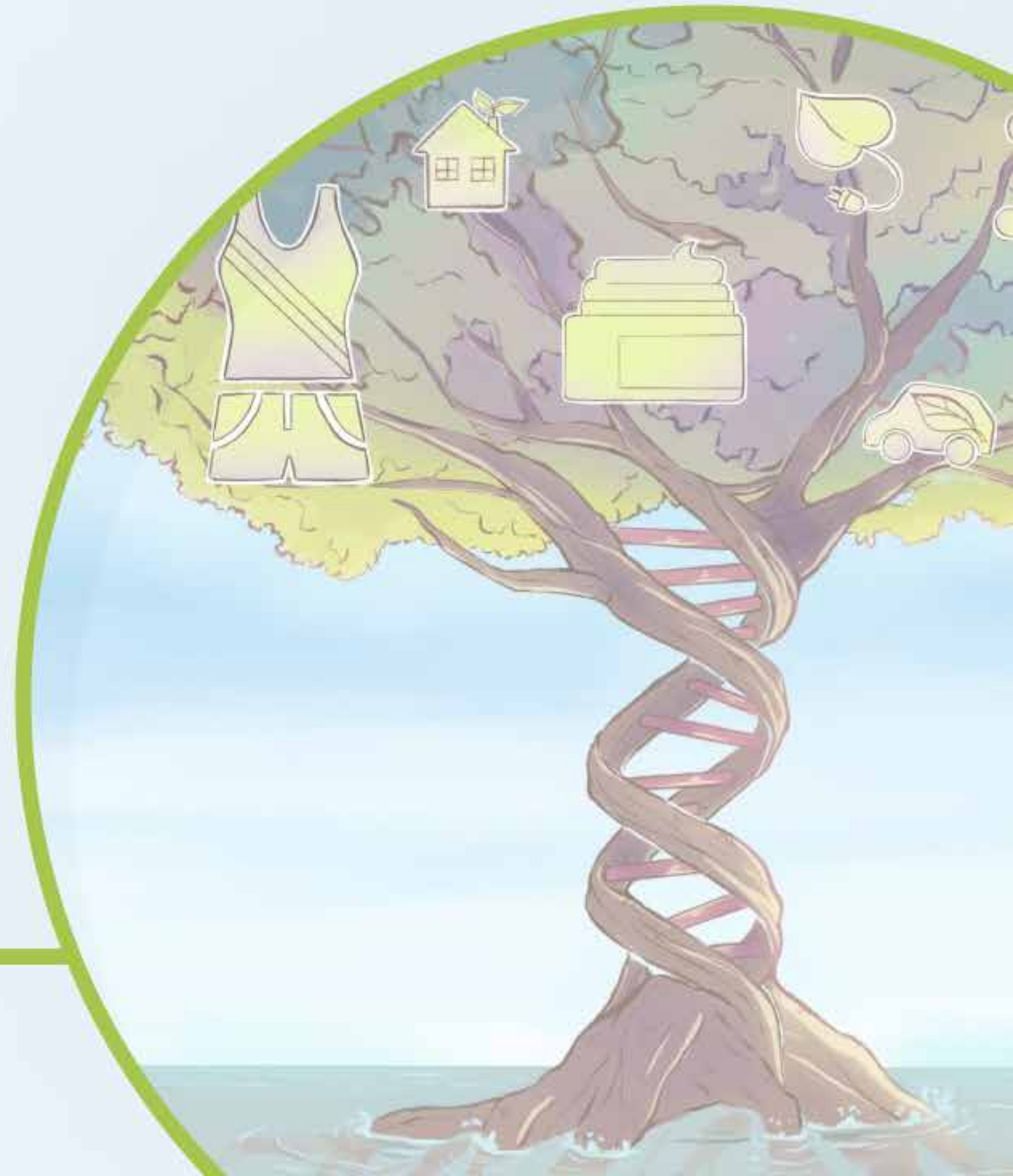




FuturEnzyme. Technologies of the FUTURe for low-cost ENZYMEs for environment-friendly products



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Research and Innovation Programme under grant agreement No [101000327]



FuturEnzyme, a project meeting customers' demands

Visions for the consumer products of 2030

There is a worldwide concern for the **protection of the environment** that clearly implies daily used goods such as **detergents, textiles and cosmetics**. The average current consumption in a European household with 4 members in a year is:



**16-20 kg
of detergent**



**30 kg
of textiles**



**1 kg
of cosmetics**

By 2030 this consumption will grow at an annual rate of 4.8-6.3%. Because of their extensive use, the environmental impact from production to consumption should be as low as possible, reducing water pollution and consumption, chemical usage, waste production and energy consumption, increased biodegradability and maximum efficiency.

The number of manufacturers that give an important consideration to the environment is constantly increasing. For decades this matter has been a priority to some of them, such as our manufacturer partners, Henkel, Schoeller and Evonik; they have been continuously working to bring more efficient, greener products to consumers. In numbers:

Henkel has reduced in the last
11 years per ton of product
44% CO₂ emissions
44 % of waste
28 % of water

Evonik has lowered
44 % CO₂ emissions
within the last 13 years
5% waste within
the last 3 years

Schoeller

Produces under bluesign® system guidelines since 2001

Has reduced to half the energy they use for warm water by applying heat recovery; moreover, approx. 30% of their own electricity consumption is currently produced by the photovoltaic system (solar power), installed in 2019

Generates wastewater that can be fed into the normal wastewater

Uses schoeller®-ecody which saves around 1 ton of CO₂ emissions and additional water for the dying of 2 tons of textiles.



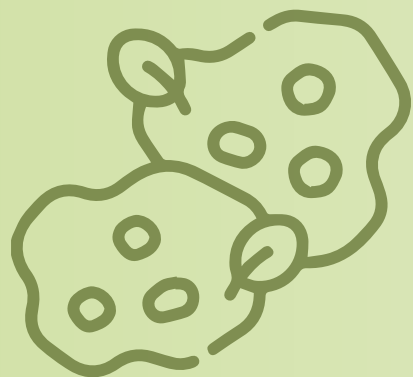


All these efforts already make a difference, but our determination is to keep **pursuing a 100% sustainable model** of production and consumption through constant innovation. Furthermore, several policy initiatives have already been undertaken at the political level to make the **European Union the first climate-neutral region**.

*Enzymes give our products a higher environmental excellence:
FuturEnzyme's ambition to meet customers' demand*

Constant innovation is required to meet the high standards required by consumers and industries. One such innovation is the use of **enzymes** (proteins that accelerate chemical reactions), substituting the use of chemical agents while reducing energy and water consumption. FuturEnzyme aims to approach the complex reality and challenges of detergent, cosmetic ingredients and textile production through the development of microbial enzymes with enhanced performances compared to the existing ones in the market.

For instance:



Adding few grams of enzymes to a liter of detergent allows using “cold-water”, which saves 30% of energy during the wash cycle, while increasing stain removal; moreover, our enzymes will be stable to withstand different washing programmes and storage conditions

Producing a textile from yarn requires multiple steps that use chemicals (1.5-3.0% by weight) and need to be eliminated with an extensive amount of water; that can be significantly reduced by using enzymes to remove such chemicals. Furthermore, our enzymes will remove different types of substances such as oils from different types of fabrics without damaging their surface

Along the production of cosmetic ingredients, such as hyaluronic acid, high temperatures are needed. Their bio-processing with enzymes will lower the temperature and thus energy consumption. What is more, our enzymes will cut molecules such as hyaluronic acid to pieces of a defined size with best anti-ageing properties

In addition, the cost of enzymes must be low enough to make their use economically viable.

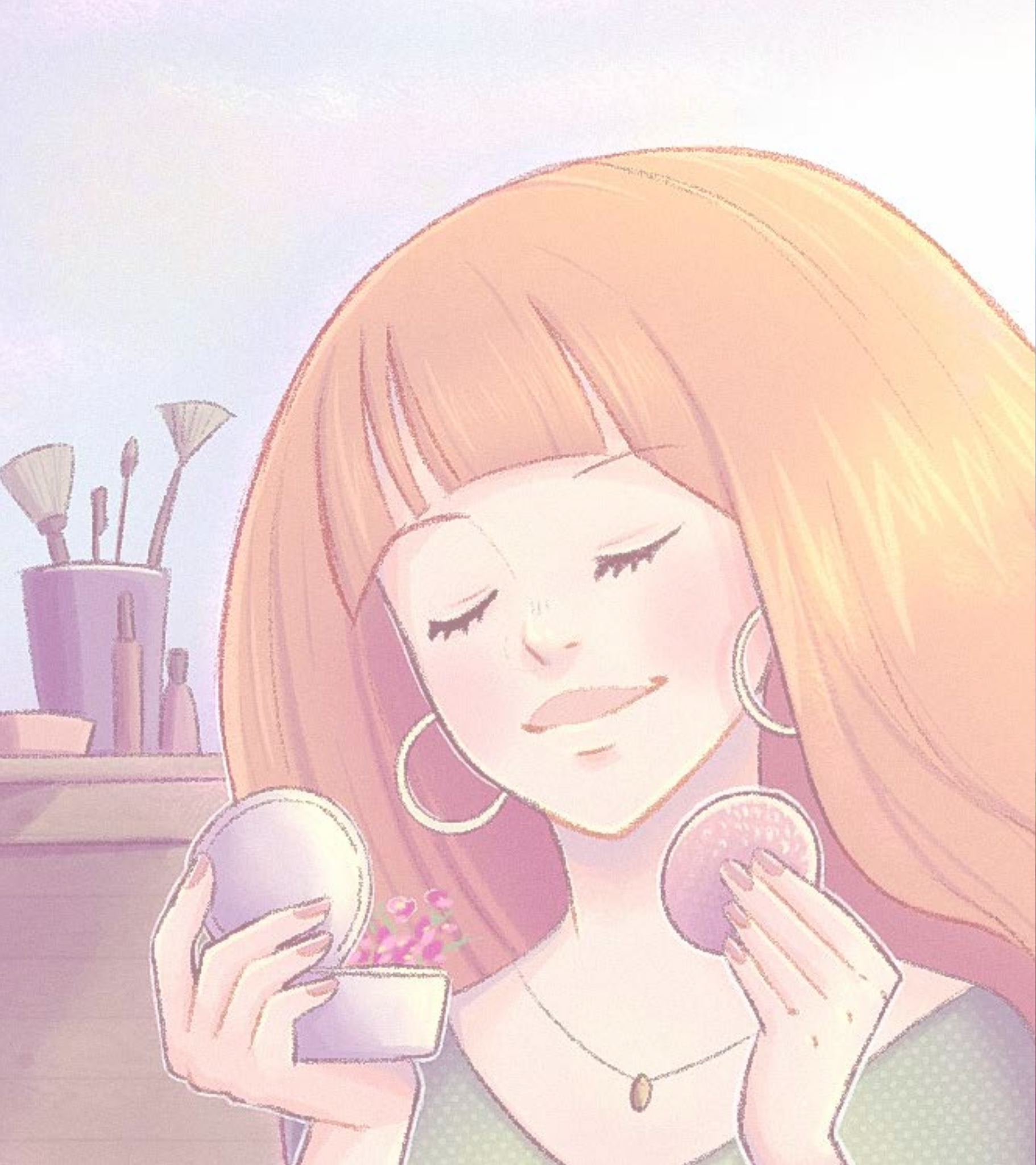


FuturEnzyme will allow selecting “intelligent” enzymes that meet the characteristics of efficiency and stability required by industry through a massive search of enzymes from microorganisms and their massive analysis using supercomputers. Biotechnology techniques will be applied to improve, technically and economically, their performance and productivity.

We strongly believe that with these enzymes, that themselves are eco-ingredients, **consumers will have at their disposal more environmentally friendly, effective and innovative liquid detergents, anti-ageing cosmetics and textiles.**







Partners



Consiglio Nazionale
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www.futureenzyme.eu