Achieving chemical-free natural cosmetics with the power of enzymes

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A EUR 7 million EU-funded project has been launched with the intention of replacing chemical cosmetic production techniques with eco-friendly alternatives. By doing so, the OPTIBIOCAT project hopes to provide the natural cosmetics sector with the necessary technical sophistication to meet growing consumer demand for natural, environmentally friendly products.

The European natural cosmetic market has experienced exceptional growth in recent years, driven largely by consumer demand for organic ingredients and greater awareness of the need to avoid harmful substances such as parabens. As a result, drugstores, supermarkets, and even discount stores have introduced private label natural cosmetic products, bringing what was once niche into the mainstream.

According to analysts, the global demand for natural cosmetics was over EUR 5.8 billion in 2012 and is expected to reach an incredible EUR 10.1 billion by 2018.

But despite this, the total share of natural cosmetics sales as a proportion of overall of cosmetic sales in Europe remains relatively low. One reason for this is the absence of harmonised standards, which means that legitimate products have to compete against conventional cosmetics that can still be labelled as 'natural' because they happen to contain some natural ingredients. A second reason is the lack of viable alternatives to chemical production techniques. This is where the EU-funded OPTIBIOCAT project comes in.

Building on a diverse consortium of 16 partners from eight European countries, OPTIBIOCAT, which began in 2013 and runs until 2017, will equip companies with the knowledge and expertise to introduce environment-friendly processes and use new natural ingredients. This will be achieved primarily through using enzymes - cellular catalysts that control reactions that take place in cells and increase the rate at which these reactions occur - in place of conventional chemicals.

These so-called biocatalysts require fewer production steps and can function in lower temperatures, thereby reducing energy requirements and unwanted side effects such as odour. In addition, enzymes are specific for the type of reaction they catalyse - there are no by-products or waste.

Interestingly, one area where the application of enzymes has significant potential as an ingredient is in skin protection products. Enzymes have been identified as having the ability to capture free radicals, preventing damage to the skin caused by environmental pollution, smoke, sunlight and other harmful factors.

The project will also test enzymes to see if they have potential uses in other industrial sectors such as the food ingredients industry. Certain enzymes can be used to produce food antioxidants, and may also have applications for cancer drugs. In the final development step of the project, the potential to scale up and optimise the fermentation process for the production of enzymes will be examined, while the allergenicity and safety of new compounds will be examined.

At the end of the project, a portfolio of new novel biocatalyst compounds will be developed, which will most likely include 50 fungal and 500 bacterial esterases (a special kind of enzyme), bringing the environmentally responsible production of natural cosmetic ingredients fully into the mainstream. The potential industrial benefits of this

project are therefore huge.

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