

"GREEN CHEMISTRY" & SUSTAINABLE COSMETIC BIOTECHNOLOGY & COSMETIC APPLICATIONS

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Novel synthetic routes for green cosmetics

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As key actors of biotransformation, enzymes can provide innovative solutions to develop sustainable processes and access to a larger variety of bio-based molecules for cosmetic fields. Nowadays, numerous approaches are available to discover, optimize and even create enzymes with desired properties and showing enough robustness for industrial applications. Exploiting this valuable pool is a real challenge for the delivery of new cosmetically active ingredients. Screening the existing biodiversity in the search of appropriate catalysts is definitely a good option. To this end, one can turn to functional genomics or metagenomics if efficient and high throughput screening protocols are available or can possibly be developed. Alternatively, protein engineering approaches also occupy leading position for tailor-made design of enzymes. Combinatorial and semi-rational approaches supported by computational biology are indeed very efficient ways to enhance enzyme stability, change enzyme specificity and deliver green synthetic tools meeting requested specifications. These various approaches and their evolution will be presented and discussed through illustrations issued from the recent achievements of the group of catalysis and enzyme molecular engineering. The examples will favor green processes involving enzymes acting on agro-resources and of interest for cosmetics.