

Multienzymatic grafting and trimming of glycosylated natural products

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A large number of natural products exist in the glycosylated form. Glycosylation can significantly improve the physicochemical and biological properties of small molecules like vitamins, antibiotics, flavors, and fragrances [1]. Chemical synthesis of glycosides is, however, far from trivial and involves multistep routes that generate lots of waste. Questionable selectivity (both stereo- and regio-), harsh conditions, and toxic chemicals including heavy metals (Hg, Cd, Ag) disqualify these methods in the food and medical preparations. Enzymes are an excellent alternative in selective modifications of natural products mostly due to their high specificity [2]. Enzymes can be used for synthetic applications involving both for “grafting” and “trimming” of glycosides.

In this presentation, multienzymatic glycosylations of alkaloids [3], vitamins, flavonoids [4] and some other biologically active natural products will be demonstrated [5]. Enzymatic “trimming” of flavonoids used largely in nutraceuticals [6] will be presented along with a novel concept of “immobilized substrate” that strongly improves productivity of these enzymatic processes.

References

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