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Access to new C-Glycosides from unprotected sugars via a Green Chemistry approach

AUTHORS
Marie-Céline FRANTZ / L'ORÉAL, 1 AVENUE EUGÈNE SCHUELLER, AULNAY-SOUS-BOIS

PURPOSE OF THE ABSTRACT

Carbohydrates are valuable and versatile building blocks that have notably been used for a variety of industrial applications. In the cosmetic industry, they are commonly utilized as active ingredients in skin and hair care products. In addition to their biological and physico-chemical functions in living organisms, carbohydrate derivatives are also of interest in terms of sustainable chemistry. Hence, the development of new sugar derivatives is clearly key to many areas, including the cosmetic industry.

To this end, an efficient, divergent and straightforward access to novel C-glycosides has been developed, namely alpha-hydroxy carboxamide and carboxylic acid derivatives, via a green and scalable process from unprotected carbohydrates [1]. The method involves condensation of 1,3-dimethylbarbituric acid with unprotected sugars followed by subsequent barbiturate oxidative cleavage in the same pot. Further expanding of the chemistry led to the development of efficient entries to diastereoisomerically pure C-glycosyl-alphahydroxy esters or amides through nucleophilic attack on a readily available and versatile key lactone intermediate.

Finally, this methodology fulfills L'Oréal's commitment to Green Chemistry resumed in 3 pillars [2]: 1/ it uses renewable or potentially renewable raw materials, 2/ the process can be environmentally friendly, and 3/ the final compounds show favorable in silico environmental impact.

Cosmetic applications of these novel C-glycosides are ongoing.

FIGURES

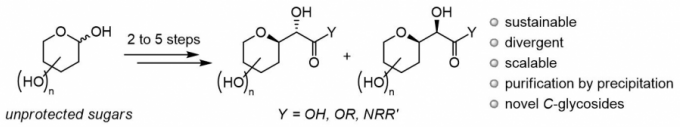

FIGURE 1

General process in 2 to 5 steps

New type of alpha-hydroxy-carbonyl-C-glycosides are obtained through a sustainable, divergent and scalable process, without excessive purification.

FIGURE 2

KEYWORDS

C-glycosides | unprotected sugar | tandem & cascade reaction | reaction in water

BIBLIOGRAPHY

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