Lipase-assisted synthesis of potential bio-based surfactants starting from lignocellulosic carbohydrates

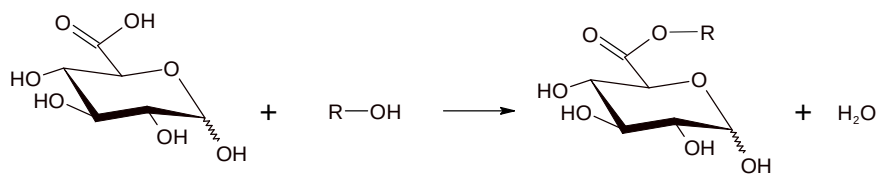
Gaëtan RICHARD [a,b], Katherine NOTT [b], Michel PAQUOT [a], Jean-Paul WATHELET [b]

(a) *Unit of Biological Chemistry, Gembloux Agro-Bio Tech, Liège University, Passage des Déportés, 2, B – 5030 Gembloux, Belgium* * paquot.m@fsagx.ac.be

(b) *Unit of General and Organic Chemistry, Gembloux Agro-Bio Tech, Liège University, Passage des Déportés, 2, B – 5030 Gembloux, Belgium.*

Surfactants constitute an important class of compounds with a lot of applications, especially in the food and beverage industries (emulsion forming and stabilization, antiadhesive and antimicrobial activities)[1]. With the prospect of synthesising new active compounds, white biotechnology offers efficient tools. Indeed, the use of enzymes as biocatalysts provides an interesting synthetic route in comparison to the chemical way that often requires high reaction temperatures and suffers from a lack of specificity, resulting in complex mixtures. Among all the biocatalysts available, lipases represent a class of industrial interest [2,3]. In parallel, the starting material is also an important parameter : due to the depletion of petroleum reserves, its ever increasing price and various environmental aspects, the use of renewable or biomass resources is inevitable.

Within the frame of a biorefinery project, we focused on the lipase-assisted modification of uronic acids. These carbohydrates can be obtained from lignocellulosic material, and, in the presence of fatty alcohols, the *Candida antarctica* lipase B catalyses the synthesis of amphiphilic compounds. Owing to the initial conditions used and the addition of co-solvents, we optimized the synthesis of these bio-based potential surfactants, and obtained a panel of various structures depending to the acyl acceptor used. The poster will present the details of these syntheses.



glucuronic acid **fatty alcohol** **bio-based amphiphilic molecule**

[1] Kralova I., Sjoumlblom J. *Journal of Dispersion Science and Technology* **2009** *30(9)* : 1363 - 1383
[2] Hasan F., Shah A., Hameed A., Enzyme and Microbial Technology **2006** *39* : 235-251
[3] Houde A., Kademi A., Leblanc D. *Applied Biochemistry and Biotechnology* **2004** *118* : 155-170