Sanches Natumi, Regiane (2016): Enzymatic Synthesis of Biosurfactants. Supervisors: Fischer, Richter (Masterthesis).

ABSTRACT

The green and sustainable production of biodegradable surfactants relevant for commercial application is becoming increasingly important. This holds true, especially for bio-based surfactants consisting of inexpensive, renewable and easily accessible starting materials such as sugars, amino sugars, terpenes and fatty acids. For the synthesis of bio-based surfactants, enzymes are useful tools because they can be biosynthesized, require often mild reaction conditions, provide high selectivity and lead to decreased amounts of side products and waste.

The current work focuses on i) the synthesis of a novel molecule that can be potentially applied as surfactant, ii) including the search for new renewable starting materials, iii) the screening of various hydrolases, iv) the optimization of reaction conditions such as effect of mole ratio, temperature, catalyst loading and solvent and v) the optimization of isolation and purification procedure of the novel synthetized molecule.

A novel molecule was synthetized having as starting material an amino sugar moiety and a terminal unsaturated fatty acid and using *Candida Antarctica* lipase B as catalyst with 16% conversion in 72h at 50°C and acetone as solvent. Although yield was moderate, the findings are very important and useful for the generation of novel additives that can be applied as adhesive for example. Furthermore, a new purification procedure of the product was created for the isolation of the novel synthetized molecule that was further characterized by HPLC-MS, ^{1}H-NMR and 13C-NMR.