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**Microbial biosurfactants, more than simple amphiphiles:  
 From structure-property relationships to soft materials**



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Microbial biosurfactants are one of the most fascinating success stories in the field of green chemistry since at least four decades. Specific microorganisms are able to produce large quantities of biodegradable molecules with surface active properties. If phospholipids, lipopeptides, glycolipids and polymers are the major classes, glycolipids certainly constitute the most interesting one for the large produced amounts. Compounds like sophorolipids and rhamnolipids are now well-known and routinely employed in detergent and cosmetic formulations, for their low toxicity and high biodegradability. Despite these important achievements, many questions still lie unanswered and the potential of these molecules is in fact largely underexploited, especially in other domains like colloid chemistry and materials science. This paper will illustrate the recent advances in terms of molecular developments through both chemical and genetic engineering tools, thus expanding the portfolio of existing molecules. It will also discuss the most recent understanding between selected molecular structures and their corresponding physicochemical properties. It will conclude on the potential development of biosurfactant-based soft materials, including hydrogels, tough foams and emulsions.

**Biography**

Niki Baccile has graduated from the University of Padova (Italy) and has completed his PhD in Materials Science from University Pierre and Marie Curie, Paris 6 (now Sorbonne University) and Post-doctoral studies from University of Montpellier (France) and Max-Planck-Institut für Kolloid- und Grenzflächenforschung Stute (Germany). He is a CNRS Researcher at the Laboratoire de Chimie de la Matière Condensée de Paris at Sorbonne University. He has published more than 70 papers in internationally renowned peer-reviewed journals on topics going from Green Chemistry, Materials' Chemistry, Physical Chemistry and Soft Matter. He has contributed to the developments in the field of biosurfactants in the past 10 years, collaborating with the worldwide experts in the field of Industrial Biotechnology.

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