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Molecular hydrogels from microbial biosurfactants

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 discuss the hydrogel-forming properties of this class of molecules. Hydrogels are an important class of soft materials and they are generally composed of polymers. However, low-molecular weight gelators are becoming more and more important for their stimuli-responsiveness and improved toughness. The hydrogel-forming potential of biosurfactants was only discovered very recently and we aim at showing the latest advances in this field.

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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