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Microbial biosurfactants: state of the art

Microbial biosurfactants are naturally produced surface-active molecules able to reduce surface and interfacial tensions between different phases. Research into biosurfactants has been gaining a prominent position within the research and development drive of many industrial establishments aiming to deliver on initiatives for alternative product from cheap renewable feedstock using sustainable industrial practices with lower foot print impact and environmental friendly compounds. They have many important properties including acting as foaming, wetting and gelling agents with low critical micelle concentration and surface-tension reduction capabilities, which lends itself to applications in many industries. Biosurfactants have consistently shown suitability for application in numerous product lines and processes including detergent and cleaning products, emulsifiers in food, dispersants for pesticides, anti-fungal agents and environmental bioremediation and enhanced oil recovery. More recently, emphases on applications in cosmeceuticals as anti-aging and wound-healing agents in dermatological care and as oral hygiene, and antimicrobial, antibiofilm and anticancer activities and technologies have also emerged. The most investigated biosurfactants at the present are the glycolipid compounds including rhamnolipids produced by *Pseudomonas* bacteria, sophorolipids produced by members of the *Candida/Starmerella* yeasts and mannosylerythritol lipids produced by *Pseudozyma* yeasts. Despite the current interest in these compounds several difficulties in their applications remain. The ability to accurately detect and quantify the various congeners typically produced by all biosurfactant wild strains in addition to the difficulties often encountered in separating and purifying them. Future research is focusing into successfully tailoring these biosurfactant to the specific needs in product formulation through molecular biology techniques or product manipulations. This presentation aims to highlight the latest trends and indicative prospects for future commercial exploitations, interest and direction for microbial biosurfactants application.