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Yeast glycolipid biosurfactants

Quite a number of bacteria are able to synthesize biosurfactants. Yet, one may not neglect the importance of yeasts in this respect. Indeed, several yeast species produce glycolipids; one of the most promising classes of biosurfactants due to their attractive properties and high product titers. In the first part of this talk, a brief overview of the most important yeast biosurfactants will be given, including cellobiose lipids, mannosylerythritol lipids, sophorolipids and the less explored class of polyol lipids that are recently attracting more attention. Next, we will focus on our work on sophorolipids produced by *Starmerella bombicola*. In optimal conditions, this glycolipid is secreted in the culture medium at economical relevant yields of over 300 g/L. Even though several companies are currently putting sophorolipids on the market, their application potential could be further enhanced by introducing structural variation. We alleviated this fundamental limitation by unraveling the sophorolipid biosynthesis pathway and developing molecular tools to metabolically engineer *S. bombicola* and turn it into a versatile production platform. Indeed, most structural parts of the glycolipid biosurfactant molecule now can be controlled: fatty acid tail, sugar moiety, acetylation and lactonization. Several examples will be discussed.