Isolation and Total Synthesis of Microbial Rhamnolipid-Like Surfactants

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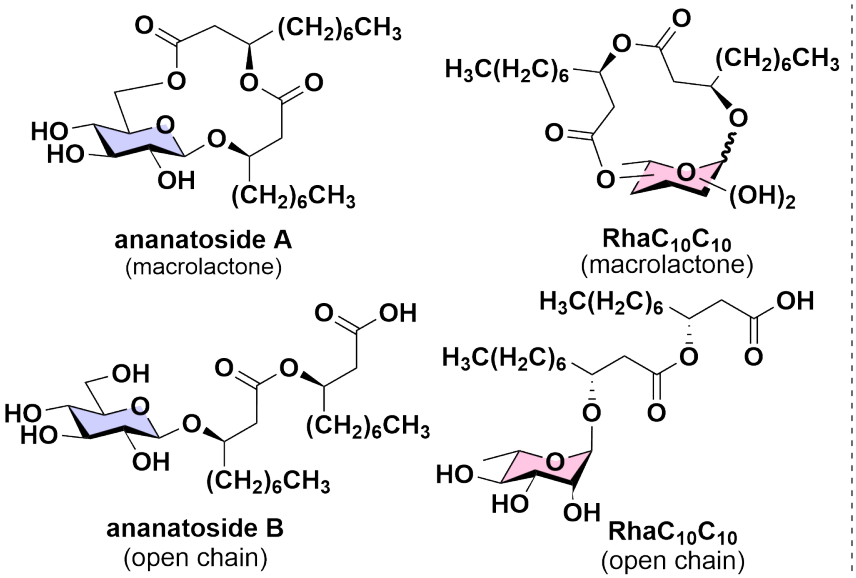
The microbial world represents an unparalleled source of carbohydrate-derived metabolites, showing astonishing structural diversity, biological functions, and therapeutic properties. The long-term goal of our research program is to develop innovative synthetic approaches enabling the total synthesis of structurally challenging and therapeutically relevant microbial glycans along with their mimics.[1] For the choice of our synthetic targets, we have been inspired by *Burkholderia* species, a group of Gram-negative bacteria that have important ecological and therapeutic implications.[2] In this keynote lecture, we will discuss on the isolation, total synthesis, tensioactive properties and biological activity of ananatosides, a novel family of microbial glycolipids that we have recently disclosed. Ananatoside A, a macrodilactone-containing glucolipid, was successfully synthesized through intramolecular glycosylation, and both chemical and enzymatic lactonizations. A series of diasteroisomerically pure, macrolactonized rhamnolipids were also synthesized through intramolecular glycosylation and their anomeric configurations as well as ring conformations were solved using molecular modeling in tandem with NMR studies. Our results suggest that the presence of the macrodilactone ring dramatically interferes with the physical and biological properties of rhamnolipid-like biosurfactants.[3]



- √ *Isolation*
- √ *Total synthesis*
- √ *Molecular modeling*
- √ *Surfactant properties*
- √ *Biological activities*

Bibliographic references:

[1] K. Muru, C. Gauthier (2021) Chem. Rec. (21) 2990-3004.
[2] M. Cloutier, K. Muru, G. Ravicoularamin, C. Gauthier (2018) Nat. Prod. Rep. (35) 1251-1293.
[3] M. Cloutier, M.-J. Prévost, S. Lavoie, T. Feroldi, M. Piochon, M.-C. Groleau, J. Legault, S. Villaume, J. Crouzet, S. Dorey, M. A. Diaz De Rienzo, E. Déziel, C. Gauthier (2021) Chem. Sci. (12) 7533-7546.