P42 – **Structure of potential agonist and antagonist LPS/LOS from marine and halophilic bacteria**

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Lipopolysaccharides (LPSs) are the main constituent of the outer membrane of Gram-negative bacteria. These endotoxins are composed of three main parts: a polysaccharide named O-antigen, a Core oligosaccharide and the Lipid A. Endotoxins lacking the polysaccharide part are termed Lipooligosaccharides (LOSs). LPSs are known to interact with a receptorial complex of mammal's innate immunity formed by Toll-Like Receptor 4 (TLR4) and Myeloid Differentiation factor 2 (MD-2). Depending on their structures, LPSs can be potent agonist or antagonist of TLR4/MD2 [1]. Characterizing LPSs from diverse bacterial sources is hence crucial to find new modulators of the innate immunity.

The present study is focused on the structural elucidation of LPSs from marine and halophilic bacteria. Three different bacterial strain were investigated. *Pseudoalteromonas sp* 1A1 is a sponge pathogen bacteria of *S.domoncula* [2]. *Spiribacter salinus* is a halophile isolated from an intermediate-salinity pond in Spain [3]. *Halopeptonella vilamensis* is a halophilic bacteria found in a saline lagoon in Argentina [4].

Each bacterial strain underwent a hot phenol-water extraction. The extracted content was then purified by enzymatic digestion and column chromatography. After chemical treatment, extracted polysaccharides were analysed by 2D NMR spectroscopy and the lipid A by MALDI-TOF Mass Spectrometry (MS) and MS/MS.

The present communication reports the structural determination of the LPS from *Pseudoalteromonas sp* 1A1 and the Lipid A from *S. salinus* and *H. vilamensis*. The immunological activity and the outer membrane properties of *Pseudoalteromonas sp* 1A1 LPS were also investigated. Lipid A species differing on their phosphorylation and acylation were found. These results are interesting from an immunological point of view as the interaction between LPSs and TLR4/MD2 is structure dependent.

References

[1] Molinaro, A.; Holst, O.; Di Lorenzo, F.; Callaghan, M.; Nurisso, A.; D'Errico, G.; Zamyatina, A.; Peri, F.; Berisio, R.; Jerala, R.; Jimenez-Barbero, J.; Silipo, A.; Martin-Santamaria, S.; Chem. Eur. J. 2015, 21, 500-519
[2] Gardères, J.; Bedoux, G.; Koutsouveli, V.; Crequer, S.; Desriac, F.; Le Pennec, G. Mar. Drugs 2015, 13, 4958-5006
[3] Barrau, C.; Di Lorenzo, F.; Javier Menes R.; Lanzetta R.; Molinaro A.; Silipo A.; Mar. Drugs 2018, 16, 124
[4] Menes, R.J.; Viera, C.E.; Farias, M.E.; Seufferheld, M.J.; Extremophiles 2016, 20, 19-25