P28 & FP – **Structure of potential TLR4/MD-2 modulators from different bacterial sources**

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Lipopolysaccharides (LPS) represent one of the most important glycoconjugates found on the outer membrane (OM) of Gram-negative bacteria cell wall, covering around 75% of its surface. They are crucial for bacterial survival, contributing significantly to the integrity and stability of the OM and protecting the bacterium from the external milieu stress factors. These amphiphilic molecules are divided into three genetically, biologically and chemically distinct domains – a hydrophobic glycolipid portion called lipid A, a repeating glycan termed O-polysaccharide and a core oligosaccharide connecting the two domains[1]. More interestingly, the LPS are classed as PAMPs (Pathogen Associated Molecular Patterns) since they are able to trigger hosts innate immune responses. The key event in the signalling is the recognition of LPS by the TLR4/MD-2 receptorial complex, triggering the activation of immune defences, and stimulating the production of inflammatory cytokines[2]. If the TLR4/MD-2 driven activation of the innate immune response is beneficial to combat the infection, its over-stimulation leads to sepsis and finally life threating septic shock. Nonetheless, modifications in the LPS structure, and more precisely in the lipid A region, affect its immunostimulant properties, including reduction of TLR4/MD-2 activation and even inhibition of signalling caused by agonistic molecules[3]; hence, the search of LPS possessing inhibitory activity is a high importance and interest topic.

Here, I will present the structural characterization of the lipopolysaccharides extracted from two different bacteria, *Acetobacter pasteurianus* and *Phaeobacter gallaeciensis*. *A. pasteurianus* is an acetic acid bacterium used in production of traditional Japanese black rice vinegar, kurozu. The beverage is believed to carry several health benefits. *Phaeobacter gallaeciensis* BS107 is a bacterium living in a particular ecological interaction with algae. After isolation and purification of the cell wall components, the LPS components were separated and the structure of three domains was obtained using a combination of chemical, spectrometric and spectroscopical methods; furthermore, their inflammatory and inhibitory activity was also evaluated.

References

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