Recognition mechanisms of bacterial glycans by host immune system receptors

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Glycans act as an interface between the outer environment and the cell membrane of all living organisms. They exhibit broad structural diversity and are involved in fundamental biomolecular mechanisms. Particularly, glycans are the main actors in the interaction mechanisms of bacteria with eukaryotic host, serving as counter receptors for different proteins, including lectins[1]. These are exposed on the surface of innate immune cells and represent an important class of Pathogen Recognition Receptors (PRRs) characterized by their ability to recognize glycans. These PRRs may contribute to initial recognition of bacterial glycans, thus providing an early defense mechanism against bacterial infections, but some of them may also be exploited by bacteria to escape immune responses. Several human pathogens have indeed developed the capability to cover their surfaces with glycans mimicking eukaryotic SAMPs (Self Associated Molecular Patterns) structures, able to interact with inhibitory host receptors, thus eluding host immune responses and promoting infections. Among them, the ESKAPE (*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, Enterobacter* species) pathogens exhibit multidrug resistance and represent a global threat to human health[2].

Within this frame, we elucidated the chemical structure of the capsular polisaccharide extracted from an *A. baumannii* clinical isolate with the aim to investigate its recognition by inhibitory host receptors.

To achieve our goal, a multidisciplinary approach, relying on different biophysical techniques including NMR spectroscopy, Mass Spectrometry and computational methods, have been applied.

Bibliographic references:

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