

Internal Webinar

The bacterial cell envelope: Understanding its structure and modelling action of antimicrobial agents on it

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Bacteria are single celled, prokaryotic microorganisms that were one of the first life forms to appear on earth and have since emerged as one of the most successful organisms. A critical component of the bacterial cell is the cell envelope, a complex multi-component structure constituted of a phospholipid bilayer, referred to plasma membrane or cell membrane, which is encased by a relatively rigid exoskeleton, referred to as the cell wall, which plays the key structural role in determining cell shape. Our aim in this talk is two-fold: 1- to study the design principles of the cell wall of bacteria to understand the role played by its molecular level design features, including its cross-linked mesh-like structure and variability in the elasticity of its components, in ensuring cell viability and 2- to model the action of antimicrobial polymers (AMPolys) on the bacterial cell membrane, using detailed atomistic molecular dynamics simulations, with the aim of going beyond the traditional binary composition design of AMPolys, constituting hydrophobic and charged cationic groups, by including additional functional groups in order to better optimize their antimicrobial action.

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