REGIONAL CENTRE FOR BIOTECHNOLOGY
Seminar series

Structural Biology of Gram-positive Bacterial Adhesins

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Seminar Room

Adhesion to host tissue is the first and essential step for bacterial pathogenesis, and bacteria use multitude of proteins and pili that are associated with their cell walls for adhesion. These adhesins are considered as important vaccine candidates, due to their critical roles in host colonization. Surface proteins known as MSCRAMMs (microbial surface components recognizing adhesive matrix molecules) are covalently linked to the Gram-positive bacterial cell wall peptidoglycan, and are used by Gram-positive bacteria for adhesion and they target host's extra cellular matrix proteins such as fibrinogen, fibronectin, collagen, etc. The adhesive Gram-positive pili are assembled using two or more distinct proteins (pilins), and their assembly and anchoring are catalyzed by a transpeptidase called sortase. However, the targets for these recently discovered pili are not yet clearly defined.

There has been a sustained push for understanding the MSCRAMMs and their interactions with host tissue, and presently many crystal structures are available for different types of them in apo- as well as in ligand complex forms. The recent focus is on visualizing the individual pilin components and their associations, leading to the formation of adhesive pili. My seminar will focus on the contributions of structural biology toward understanding the interaction between MSCRAMMs and the host targets and recently discovered Gram-positive pilins and their associations, with main emphasis on common structural motifs between these bacterial adhesins and host immune response proteins.