

INVITED LECTURE T20

Crystal structure analysis of PilS, a type IVB pilin from *Salmonella typhi*

Kunchithapadam Swaminathan^{1,2} and Manikkoth B. Asha¹

¹*Department of Biological Sciences, National University of Singapore, Singapore 117543*

²*Institute of Molecular and Cell Biology, 61 Biopolis Drive, Singapore 138673*

Pilin assembly into type IV pili is required for virulence by bacterial pathogens that cause diseases such as cholera, typhoid, pneumonia, gonorrhoea and meningitis. The type IV pilus of entero-pathogenic bacteria *Salmonella typhi* is believed to be a major adhesion factor during the entry of this pathogen into gastrointestinal epithelial cells. The target receptor for the *S. typhi* pilus is a stretch of 10 residues from the first extra-cellular domain of Cystic Fibrosis Transmembrane Conductance Regulator (CFTR).

The structure of the N-terminal truncated type IVb pilin monomer (PilS) from *Salmonella typhi* has been determined by X-ray crystallography using the MAD method. The asymmetric unit contains a dimer of PilS. Also, the structure of dimeric PilS along with a 10-residue peptide of CFTR has also been determined. The structures secure a clear understanding of the subunits and also identify the potential residues that are essential for receptor binding. We also explore the implications of a disulphide bond, which is conserved in all type IV pilins and links the structurally variable D-region to the conserved structural core of the globular head domain.