QTHA QUEENSLAND TROPICAL HEALTH ALLIANCE

2014 Seminar Series

JAMES COOK UNIVERSITY AUSTRALIA

School of Public Health, Tropical Medicine and Rehabilitation Sciences presents

"Structural adventures in unravelling the lifestyles of Gram negative bacteria."

Dr Jennifer Wilson, Institute for Glycomics, Griffith University

Friday 21st February 2014, 11am

JCU Cairns A21.001 Teaching Annex; Videolinked to JCU Townsville Bldg 9 MP AV Services 001 (DA 9001)

Moraxella bovis *is the Gram negative microorganism that causes infectious bovine keratoconjunctivitis (IBK or pink eye), a disease that causes severe keratoconjunctivitis, ocular rupture or blindness in cattle. Although carbohydrate structures such as lipopolysaccharide/lipooligosaccharide and capsule are known virulence factors for many microorganisms surprising little is known regarding the presence and composition of these structures for* M. bovis. *Structural elucidation of the oligosaccharide structure of the rough phenotype of* Moraxella bovis *strain Epp63 was determined using GC-MS, methylation analysis and NMR spectroscopy. The oligosaccharide is a branched structure containing 10 sugars in addition to KDO and contains some unusual features. Using glycosytransferase mutant bacteria we have also been able to identify the function of some of the glycosyltransferase enzymes important in LOS biosynthesis. Biological evaluation of these truncated LOS mutants has provided insight into the role of the OS.*

Campylobacter jejuni *is the leading cause of human gastroenteritis worldwide with over 500 million cases annually. Chemotaxis and motility have been identified as important virulence factors associated with* C. jejuni *colonisation. Group A transducer-like proteins (Tlps) are responsible for sensing the external environment for bacterial movement to or away from a chemical gradient or stimulus. In this study, we have demonstrated Cj1564 (Tlp3) to be a multi-ligand binding chemoreceptor and report direct evidence supporting the involvement of Cj1564 (Tlp3) in the chemotaxis signalling pathway via small molecule arrays, surface plasmon and nuclear magnetic resonance (SPR and NMR) as well as chemotaxis assays of wild type and isogenic mutant strains. Here we demonstrate the ability of Cj1564 to interact with the chemoattractants and chemorepellents. This is the first report characterising Cj1564 as a multi-ligand receptor for* C. jejuni, *and illustrates its involvement in the chemotaxis pathway and subsequent survival of this organism in the host.*

Dr Jennifer Wilson is a Senior Lecturer and Research Leader at Griffith University Gold Coast Campus.

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