

**NUS Graduate School for Integrative Sciences and Engineering  
Research Project Write-up**

**Title of Project :** 1.Expression and regulation of Type III Secretion Systems in *B. pseudomallei*  
2. Suppression of host cell signaling by *B. pseudomallei*

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**Short Description**

*Burkholderia pseudomallei* is the etiological agent of melioidosis, an infectious disease endemic in Southeast Asia and northern Australia. The bacterium is also classified as a potential bioterrorism agent by the US CDC. It can cause acute, chronic or relapse disease which is either localized or systemic. The bacteria contain three Type III Secretion Systems (TTSS), which are present in many Gram-negative bacteria and responsible for virulence in hosts. TTSS gene locus contains 20 over genes which encode for a molecular complex resembling a needle, capable of delivering bacterial effectors directly into host cells' cytoplasm. We are interested in understanding how the expression of TTSS is regulated and how the various TTSS effectors contribute to virulence of the bacteria. In the first project, the conditions for expression of TTSS will be determined and the regulator genes that control TTSS will be identified. The functional importance of the TTSS will be examined in a disease model.

In the second project, we will examine the mechanism the bacteria employ to suppress host cell signaling pathways and how that related to pathogenesis.