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Lipocalin 2 (LCN2) play a protective role in host defense against *Burkholderia pseudomallei* infection

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Burkholderia pseudomallei (BPS) is a Gram-negative, facultative intracellular pathogen which is the causative agent of melioidosis, a serious invasive disease of humans and animals. Melioidosis is an important yet neglected infectious disease that is endemic to tropical regions. BPS utilizes numerous strategies that enable it to survive in such a specialized niche as the intracellular environment. In this study, we aim to understand the intracellular survival mechanisms of BPS at the host-pathogen interface and at the nutritional levels. Iron is required by both the host and the pathogen. Using in-vitro cell culture model we aim to identify the role of iron in the intracellular infection of BPS and the role of host lipocalin 2 (LCN2) protein in iron either facilitating or restrict the BPS access to the cellular iron stores. High pathogenic *B. pseudomallei* (K96243) and *B. thailandensis* (E264) (BT) were used in the study. All experiments with BPS were performed in a BSL-3 containment facility. Initially, we determined that iron is required for both extracellular and intracellular BPS infection. We then identified that LCN2 is induced during the intracellular BT/BPS infection both at RNA and protein levels and toll-like receptors- TLR2/TLR4 are involved in the induction of LCN2. Further, using RNA interference technology we found that LCN2 is required for the intracellular *Burkholderia* infection and also confirmed that the LCN2 controls the infection through iron regulation. With the findings, we conclude that iron plays a crucial role in the BPS infection and LCN2 play a protective role in host defense and suggest a potential avenue for therapeutic intervention against melioidosis.

Biography

Mr. Sandeep is a Research Associate at Duke-National University of Singapore (NUS), Medical School, Singapore. He obtained his Master's degree in 2009 in Biotechnology from the Bangalore University, India. He has been working in the field of Emerging Infectious diseases and therapeutic research for more than 8.0 years. His research interest includes pathogenesis studies on various newly emerging and re-emerging respiratory pathogens such as pH1N1 influenza virus, high pathogenic avian influenza H5N1 virus strains, respiratory bacterial pathogens such as *Klebsiella*, *A. baumannii* and also high pathogenic bacterial strain like *Burkholderia pseudomallei*. Mr. Sandeep has a good publication track record in his research work.

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