

STUDY OF SIGMA N2 REGULON IN *BURKHOLDERIA PSEUDOMALLEI*

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ABSTRACT

Burkholderia pseudomallei is the cause of melioidosis, a tropical infection of humans and other animals. The ability of *B. pseudomallei* to survive under harsh conditions including inside phagocytic cells has been linked to the expression of several pathways. Gram-negative bacteria expresses two families of sigma factors - sigma 70 (RpoS) and sigma 54 (RpoN) - are required for regulating the expression of many genes involved in metabolism and other processes. The RpoN family has been implicated in the expression of nitrogen utilization proteins however the function of the second member of the RpoN family (RpoN2) in *B. pseudomallei* remains unclear. In this study a role for RpoN2 in controlling the expression of proteins in several pathways was identified. Using complementation and 2D-gel analysis RpoN2 regulation of proteins in amino acid utilization, CysM and HisA involved in cysteine and histidine synthesis respectively were demonstrated. In addition, the level of another 21 proteins was altered in cells lacking in RpoN2, including components of the type III secretion system, bipD and LcrD/SysD. RpoN2 was also found to regulate the expression of *katE* encoding catalase II, an enzyme produced to protect cells against hydrogen peroxide. Previously, RpoS was identified as the regulator for *katE*, however our results indicate that the regulation of *katE* is more complicated and involves RpoN2 as well as RpoS. We propose that RpoS is indirectly regulating *katE* by controlling the expression of the enhancing binding proteins essential for RpoN function.

KEY WORDS: *BURKHOLDERIA PSEUDOMALLEI*/ MELIOIDOSIS/ RpoS/ RpoN/
CATALASE/ NITROGEN UTILIZATION/ PROTEOMIC.

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