

Human Neutrophil Transcriptomics Triggered by *Burkholderia pseudomallei* Infection

Duangchan Suwannasaen*¹,
Prasong Khaenam*^{1,2},
Chidchamai Kewcharoenwong¹,
Darawan Rinchai¹,
Surachat Buddhisa¹,
Damien Chussabel²,
Ganjana Lertmemongkolchai¹

Background: Our previous study has demonstrated that neutrophils from diabetes mellitus subjects living in endemic areas of melioidosis decreased the ability to phagocytose, migrate and delay apoptosis in response to *B. pseudomallei* infection. However, the immune mechanisms leading to these impairments and host susceptibility to the infection are unclear. Thus, this study aimed to identify biomarker signatures that might contribute to neutrophil functions and human susceptibility to *B. pseudomallei* infection.

Methods: Whole blood samples from newly diagnosed diabetes mellitus (NDM) and healthy controls were infected in vitro with live *B. pseudomallei* at a multiplicity of infection (MOI) 0.3 for 1 hour and with medium control. The cultured whole blood, purified neutrophils and sorted neutrophils from whole blood samples infected with *B. pseudomallei* were extracted for RNA and analyzed for the expression of blood

transcripts by DNA genomic microarray chips containing 47,231 gene probes.

Results: Whole blood samples and neutrophils infected with *B. pseudomallei* showed 253 and 219 genes with statistically significant expression in healthy and NDM, respectively. Analysis of annotated functions by David Bioinformatics Resources 6.7 software revealed that human genes associated with inflammatory responses, responses to wounding, chemokine and cytokines activities were enriched. Interestingly, we found at least 10 genes that were significantly expressed in healthy, but not NDM, and these genes were associated with neutrophil migration and regulation of apoptosis.

Conclusions: These results revealed the signaling pathways in neutrophils of healthy and NDM triggering by *B. pseudomallei* infection. The information is crucial for the study of neutrophil functions and host susceptibility to *B. pseudomallei* in diabetes mellitus.

¹Cellular and Molecular Immunology Unit, The Centre for Research & Development of Medical Diagnostic Laboratories, Faculty of Associated Medical Sciences, Khon Kaen University, Khon Kaen 40002. Thailand.

²Benaroya Research Institute, Seattle, USA.

Received for publication: September 12, 2011.

* These authors contribute equally to this work.