MD627 994 Seminar in Medical Microbiology
Department of Microbiology, Faculty of Medicine, Khon Khean University

Thesis title : Innate immune response and the important of neutrophils antimicrobial peptide defense multidrug resistance *Acinetobacter baumannii*

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Abstract

Acinetobacter baumannii is a Gram-negative bacterium with a global problem in multidrug resistant situation. Modification of its LPS leads to resistance of colistin, the last line antibiotic drug. To defense against *A. baumannii* infections, neutrophils is the first innate immune cells to get rid of the pathogen. However, *A. baumannii* still cannot be killed by neutrophil phagocytosis. A study of LPS-deficient *A. baumannii* showed the attenuation of proinflammatory responses from neutrophils in compared to wild-type. Interestingly, lysozyme, lactoferrin and LL-37 were reported as bactericidal agent against LPS-deficient *A. baumannii* at concentration of 0.6, 1,000 and 1,000 μg/mL, respectively. While the cellular function of neutrophils can effectively kill the LPS-deficient bacteria. Therefore, LPS of the *A. baumannii* was reported to be a major virulence factor against either antibiotics or immune responses.

An antimicrobial peptide is now under the spotlight to combat against *A. baumannii* with its promising antimicrobial effectiveness. A cathelicidin or LL-37 is reported as an alternative therapeutic approach to defense against bacterial infections. A study on cathelicidin-relating antimicrobial peptide knockout ($CRMP^{-/-}$) mice found increased bacterial burden than in wild-type mice. Decreasing recruitment of neutrophils and macrophages after 6 hours and 1 day of infections were reported in $CRMP^{-/-}$ mice. Moreover, IL-6 and TNF-α level and in $CRMP^{-/-}$ mice is lower than wild-type mice after 18 hours of infections.

In conclusion, beyond to neutrophil major mechanisms to eliminate the pathogen in various study, phagocytosis, degranulation and neutrophil extracellular trap or NET. Antimicrobial peptide of neutrophils, cathelicidin is important and major virulence factor against *A. baumannii*. Furthermore, the present of cathelicidin has effect to inflammatory cytokines production in innate immunity. Therefore, cathelicidin more likely to become a new approach therapeutic for *A. baumannii* infection disease by combination with the traditional drugs or helping neutrophils to eradicate *A. baumannii* without toxicity as a human antimicrobial peptide.

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