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Pseudomonas aeruginosa mediated modulation of host defense responses

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Pseudomonas aeruginosa is a Gram negative opportunistic bacterial pathogen that has a notorious reputation about drug resistance against commonly used antibiotics as well as an infectious agent to the respiratory tract of immunocompromised patients along with other microbial invaders. *P. aeruginosa* possesses diverse secretory systems, which play critical parts in releasing a number of virulence factors that are involved in causing acute and chronic infections. The potential effects of these factors on the modulation of host defense responses have been proposed. However, the resulting modulation effects against competitive bacteria, such as *Staphylococcus aureus*, are unknown since the clinical impact of polymicrobial diseases caused by combinations of pathogens has received much attention from the medical community. Here, we report that components secreted from *P. aeruginosa* enhance the expression of bradykinin receptors which act as important host defense responses against invading microbes by interacting with a ligand, bradykinin. In addition to this, LPS as a well-known membrane associated molecule pattern of *P. aeruginosa* induces the expression of TLR2, which plays a dominant role in sensing PAMPs typically expressed by Gram positive bacteria. Up-regulation of TLR2 influences the magnitude of proinflammatory responses to the secondary *S. aureus* infection. Moreover, *P. aeruginosa* Ndk with the aid of flagellin, increases the expression of interleukin-1 which is an important pro-inflammatory cytokine via NF-κB/inflammasome pathways. Taken together, the results of this study demonstrate that *P. aeruginosa* is capable of modulating host defense responses through the actions of associated or released virulence factors and this may have impacts on against a secondary microbial infection.

Biography

Un-Hwan Ha has completed his PhD in Microbiology from the University of Florida in 2002 and Postdoctoral studies in Cellular Microbiology from House Ear Institute and University of Rochester Medical Center. In 2008, he has begun to serve as an Assistant Professor at the Department of Biotechnology and Bioinformatics, Korea University and is currently positioned as a Professor. He has published more than 20 papers in reputed journals since 2008.

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