J Infect Chemother (2012) 18:145
DOI 10.1007/s10156-012-0401-z

ANNOUNCEMENT

JIC Award 2011

The Japanese Society of Chemotherapy and The Japanese Association for Infectious Diseases established the "JIC Award" to commend high-quality papers published in the *Journal of Infection and Chemotherapy*. In each volume of the Journal, one article is selected on the vote of the JIC Award Selection Committee. For volume 17, 2011, the following article was selected.

Dr. Jun Okuda

Degradation of interleukin 8 by the serine protease MucD of *Pseudomonas aeruginosa*

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J Infect Chemother (2011) 17:782–792

Abstract

We investigated the influence of the type III effector, ExoS, on the host epithelial cell response to *Pseudomonas aeruginosa* infection, and we found that disruption of the *exoS* gene caused a significant increase in the amount of interleukin-8 (IL-8) in the culture medium of Caco-2 cells. We show that IL-8 was degraded in the culture medium following infection of the cells with the wild-type (PAO1), but not the *exoS* knock-out (the *ΔexoS*) strain. Purified ExoS protein itself did not degrade IL-8. We next show that IL-8 degradation by PAO1 was inhibited by the addition of serine protease inhibitors. These results strongly suggest that a bacterial serine protease that degrades IL-8 is expressed and secreted into the culture medium of Caco-2 cells infected with PAO1, and that the expression of this protein is repressed in cells infected with the *ΔexoS* strain. The PAO1 genome encodes 28 different protease genes, including two serine proteases: *PA3535* and *mucD*. *PA3535* and *mucD* gene knock-outs were constructed (*ΔmucD* and *ΔPA3535*), and *ΔmucD* but not *ΔPA3535* showed reduced IL-8 degradation. To understand the significance of IL-8 degradation, we next evaluated neutrophil infiltration in lungs excised from mice intranasally infected with the *P. aeruginosa* strains. Increased neutrophil infiltration was observed in PAO1-infected mice, but not in *ΔexoS*- or *ΔmucD*-infected mice. Taken together, our results suggest that *P. aeruginosa* escapes from phagocytic killing due to IL-8 degradation following the secretion of the MucD serine protease, whose expression appears to be influenced by ExoS.