IMCB Invited Speaker

Speaker : **Dr. Keith Ireton**
Senior Lecturer, Department of Microbiology and Immunology, University of Otago, New Zealand

Date : 14 September 2012 (Friday)

Time : 11:00AM - 12:00PM

Venue : Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Host : Prof. Wanjin Hong

Seminar :

Subversion of human signal transduction pathways during infection by the bacterial pathogen *Listeria monocytogenes*

Listeriamonocytogenes **is a bacterial pathogen that induces its internalization into human cells and spreads to surrounding cells while remaining in the protective environment of the host cytoplasm. Infection by *Listeria* involves bacterial subversion of human signal transduction pathways that control the host cytoskeleton and/or plasma membrane. One project in my lab focuses on understanding the process by which *Listeria* provokes its internalization ('entry') into human cells. We have found that a human surface protein called 'Met' (also known as Hepatocyte Growth Factor Receptor) serves as a host receptor mediating *Listeria* entry[1]. Our current work is focused on identifying cytoplasmic human proteins that act downstream of the Met receptor to promote remodeling of the plasma membrane during bacterial internalization. A recent RNA interference –based screen has identified nine cytoplasmic human signaling proteins that have critical roles in *Listeria* uptake[2,3]. A second project in my lab is directed towards understanding how *Listeria* spreads from infected cells to adjacent healthy cells. We have shown that *Listeria* promotes its spreading by secreting a bacterial protein called 'InlC' that perturbs the structure of apical junctions in host cells[4]. InlC affects cell junctions by binding and interfering with the function of a human scaffolding protein called 'Tuba'. Current work is focused on (1) identifying human Tuba ligands that control *Listeria* spreading, and (2) understanding the physiological processes in the host cell involved in Tuba-mediated control of cell junctions.**

References:

1. Ireton, K. Entry of the bacterial pathogen Listeria monocytogenes into mammalian cells. 2007. Cell. Microbiol. 9: 1365-1375.

2. Gavicherla, B., Ritchey, L., Gianfelice, A., Kolokoltsov, A.A., Davey, R.A., and Ireton, K. 2010. Critical role for the host GTPase Activating protein ARAP2 in InlB-mediated entry of Listeria monocytogenes. Infect. Immun. 78: 4532-41.

3. Jiwani, S., Wang, Y., Dowd, G.C., Gianfelice, A., Pichestapong, P., Gavicherla, B.,Vanbennekom, N., and Ireton, K. 2012. Identification of components of the host type IA PI 3-kinase pathway that promote internalization of Listeria monocytogenes. Infect. Immun. 80: 1252-1266.

4. Rajabian, T., Gavicherla, B., Heisig, M., Müller-Altrock, S., Goebel, W., Gray-Owen, S.D., and Ireton, K. 2009. The bacterial virulence factor InlC perturbs apical cell junctions and promotes cell-cell spread of Listeria. 2009. Nat. Cell Biol. 11: 1212-1218.

About the Speaker :

Keith Ireton was born and raised in upstate New York (USA), near the city of Schenectady. He obtained his PhD from the Massachusetts Institute of Technology in 1993, and performed post-doctoral work at the Pasteur Institute from 1995-1998. His post-doc work in the laboratory of Pascale Cossart involved genetic and biochemical approaches to identify human proteins involved in infection by the pathogenic bacterium Listeria monocytogenes. In 1999, Keith started an independent research group at the University of Toronto, and hassince moved on to faculty positions at the University of Central Florida, and most recently the University of Otago in New Zealand. His current research program, funded by NIH and Marsden Fund, is focused on identifying human proteins that interact with Listeria virulence factors, and elucidating the functions of these host proteins in bacterial infection.

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