Bacteriology-2013

OMICS Group Conferences
Accelerating Scientific Discovery

International Congress on
Bacteriology & Infectious Diseases

November 20-22, 2013 DoubleTree by Hilton Baltimore-BWI Airport, USA

Intercellular and intracellular signaling systems of the rice pathogenic bacterium *Burkholderia glumae*

Jong Hyun Ham
Louisiana State University Agricultural Center, USA

Abstract

Burkholderia glumae is the major causal agent of bacterial panicle blight, an emerging rice disease threatening stable rice production worldwide. The phytotoxin, toxoflavin, has been known to be an important virulence factor of this pathogen. However, the virulence mechanism of this pathogen has not been studied much, except that the quorum-sensing mediated by the LuxI and LuxR homologs, TofI and TofR, was elucidated as a central signaling/regulatory component for the expression of major virulence factors including toxoflavin. Our molecular genetic and genomic studies of *B. glumae* revealed novel signaling components involved in bacterial virulence. Genetic dissection of the *tofI/tofR* locus through a series of marker-less gene deletions led to the discovery of the quorum-sensing modulator *tofM* from an intergenic region between *tofI* and *tofR*. The two-component system comprised of the sensor histidine kinase PidS and the response regulator PidR was found to be essential for the functional type III section system and the intact production of toxoflavin. TepR, a LuxO homolog, was identified as a novel negative regulator of toxoflavin production. LuxO proteins belong to sigma 54-dependent response regulators and are known to act as signaling components for the quorum-sensing systems of *Vibrio* spp. In addition, a recent RNA-sequencing analysis implied the involvement of the DSF-type quorum-sensing and the cyclic di-GMP signaling in the virulence of *B. glumae*. Taken together, the pathogenic behaviors of *B. glumae* are likely governed by a complex network of intercellular and intracellular signaling pathways.

Biography

Jong Hyun Ham earned his Bachelor's degree in agricultural biology and Master's degree in plant pathology from Korea University in Seoul, Korea. He completed his PhD in plant pathology at Cornell University in 1999. He then worked at University of Illinois at Urbana Champaign, University of Wisconsin-Madison and Ohio State University as a post-doctoral fellow and research scientist. He joined Louisiana State University Agricultural Center in 2007 as a faculty member and has worked on molecular genetics and genomics of plant pathogenic bacteria and plant-bacterial interactions at the same position.