

Friday, June 11, 2010 in SCIE 1511

**Dr. Eoin
O'Grady
11:00 am**



**Post Doctoral
Fellow, University
of Calgary**

It's time to talk - Quorum Sensing in *Burkholderia cenocepacia*

In the first part of my talk I will give an insight into the quorum sensing (QS) hierarchy in the opportunistic pathogen *Burkholderia cenocepacia*. We recently showed the two QS systems reciprocally regulate the majority of co-regulated genes enabling fine-tuned gene expression. I will also briefly discuss a novel protein, present in diverse *Burkholderia* species, that enhances QS signal production by a mechanism we have yet to uncover. I will then show a link between QS and regulation of the LysR-type transcriptional regulator, ShvR. ShvR negatively regulates the QS master regulators so that QS signal production occurs earlier during growth in a *shvR* mutant. ShvR also negatively regulates genes involved in protease production and the type II secretion system. Lastly, I will show how ShvR positively regulates an adjacent 23-kb genomic region by directly binding target promoters. This genomic region is particularly interesting because it influences colony morphology, biofilm formation, virulence and antifungal activity.

**Dr. Heidi
Mulcahy
11:45 am**



**Post Doctoral
Fellow, University
of Calgary**

Pseudomonas aeruginosa* biofilms in vitro and in vivo during chronic infection of *Drosophila melanogaster

Biofilms are structured multicellular microbial communities encased in an extracellular matrix. Although biofilms have been extensively studied *in vitro*, the environmental signals which induce biofilm formation have remained elusive. I will present data demonstrating the identification of low magnesium as a bona fide signal that promotes biofilm formation in *Pseudomonas aeruginosa*. Low magnesium conditions activate the PhoPQ response, resulting in direct repression of RetS (a well characterized repressor of biofilm formation). Repression of RetS results in increased exopolysaccharide production and biofilm formation. For the second part of my talk, I will present some *in vivo* imaging of *P. aeruginosa* biofilms in *Drosophila melanogaster* and showcase this as a novel biofilm infection model. Data will be presented showing that the expression of exopolysaccharide is essential for *P. aeruginosa* biofilm formation *in vivo*. Finally, the formation of *P. aeruginosa* biofilms *in vivo* induces *Drosophila* antimicrobial peptide genes and promotes survival compared to non-biofilm *P. aeruginosa* infections.

Co-hosts: Joe Lam and
Emma Allen-Vercoe.
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ALL ARE WELCOME TO ATTEND!