Department of Molecular and Cellular Biology

Graduate Seminar MCB*6500

Wednesday, April 12, 2017 in SSC 1511 @ 12 noon

presented by:

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Examining the Intraspecific Interactions in Mixed-Strain Biofilms Containing the Prairie Epidemic Strain and Unique Clinical Isolates of *Pseudomonas aeruginosa*

Pseudomonas aeruginosa is the predominant species causing chronic lung infections in adult patients with the genetic disease cystic fibrosis (CF). *P. aeruginosa* can form biofilms that provide protection from host immune- and antibiotic-challenge, allowing it to persist in the CF lung environment. Previously, it was believed that CF patients acquire unique *P. aeruginosa* strains from their environment, with no concerns of transmissibility. However, strains that are highly transmissible among CF patients have recently been discovered. One example, the prairie epidemic strain (PES), was identified in CF patients throughout the prairie provinces of Canada. Importantly, the PES was found to be capable of replacing less virulent unique *P. aeruginosa* isolates pre-existing in the lungs of CF patients. A high throughput screen was previously used to evaluate multi-isolate biofilms produced by concurrently inoculating a microtiter plate with PES isolates and unique clinical *P. aeruginosa* isolates that were either stable or replaced by the PES. This screen identified a unique replaced isolate that promotes biofilm formation, and a unique stable isolate that inhibits biofilm formation, when cultured with the PES. To deduce the type of intraspecific interactions occurring, this project first aims to determine the effects of sequential inoculation on multi-isolate biofilm formation. Fluorescence microscopy will then be used to visualize the biofilms and potential intraspecific interactions, and digital droplet PCR will be used to determine isolate concentrations within the biofilms. This study will provide insight into CF-relevant intraspecific interactions and strain-replacements, which may have implications in the treatment of bacterial lung infections.