



Announcement:

All interested members of the university community are invited to attend the Final Oral Examination for the degree of **Master of Science** of

NICOLE GARNIER

on Thursday, March 12, 2020 at 2:00 p.m. in SSC 1511

Thesis Title: Examining the intraspecific interactions in mixed-strain biofilms containing the prairie epidemic strain and unique clinical *Pseudomonas aeruginosa* isolates.

Examination Committee:

Dr. J. Vessey, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. C. Khursigara, Dept. of Molecular and Cellular Biology
Dr. E. Allen-Vercoe, Dept. of Molecular and Cellular Biology
Dr. C. Whitfield, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. C. Khursigara (Adv)
Dr. E. Allen Vercoe

Abstract: The prairie epidemic strain (PES) of *Pseudomonas aeruginosa* causes infections in cystic fibrosis (CF) patients that lead to an increase in morbidity and mortality. The PES can cause superinfections and outcompete previously existing *P. aeruginosa* isolates within the lungs of CF patients, however, the interactions that occur to allow this to happen are currently unknown. Chronic infections are associated with biofilm formation, so this work examines the biofilms formed when PES isolates are cocultured with clinical *P. aeruginosa* isolates that either remained stable (P637) or were replaced by the PES during a superinfection (P261). Biofilms were quantified using a crystal violet biofilm formation assay, imaged using confocal spinning disk microscopy and fluorescence stereo zoom microscopy, and the isolates within the coculture biofilms were quantified using Droplet Digital™ PCR (ddPCR). P637 and P261 decrease and increase biofilm formation, respectively, when cocultured with the PES. The imaging results revealed that both isolates are present in each coculture biofilm after 24 hours, but the isolate localization varies. Based on preliminary ddPCR results, the PES is present in very low concentrations with either P637 or P261. The results of this project combined with recent sequence data suggests that there may be alterations in the regulation of biofilm formation in these cocultures, potentially due to changes in bacterial quorum sensing.

Curriculum Vitae: Nicole obtained her Bachelor of Science (Hons.) at the University of Guelph in 2014. She began her M.Sc. in the lab of Dr. Cezar Khursigara in the fall of 2015.