UNIVERSITY of GUELPH

COLLEGE of BIOLOGICAL SCIENCE

DEPARTMENT OF MOLECULAR AND CELLULAR BIOLOGY

Announcement:

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

KIRSTEN CHULI

on Wednesday, January 10, 2018 at 9:30 a.m. in SSC 2315

Thesis Title: **Examining the distribution of the extracellular polymeric substances in the biofilms of the Liverpool Epidemic Strain of *Pseudomonas aeruginosa***

Examination Committee:

Dr. A. Bendall, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. C. Khursigara, Dept. of Molecular and Cellular Biology
Dr. C. Whitfield, Dept. of Molecular and Cellular Biology
Dr. G. Cox, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. C. Khursigara (Adv)
Dr. C. Whitfield

Abstract: The Liverpool Epidemic Strain (LES) of *Pseudomonas aeruginosa* is responsible for causing antibiotic resistant, transmissible infections in individuals with cystic fibrosis. The biofilm lifestyle, which has been well characterized in *P. aeruginosa*, is thought to contribute to the enhanced ability of isolates of this strain to resist drug therapy and persist in the lung environment. The extracellular polymeric substances (EPS) produced by biofilm cells have been implicated in biofilm mediated drug resistance, although their abundance, localization and response to antibiotic treatment has not previously been characterized in the LES. In this study the predominant EPS components, extracellular DNA (eDNA) and secreted polysaccharides, were quantified using fluorescent staining and confocal microscopy in biofilms of eight LES isolates grown in flow cells. The LES isolates formed biofilms that were phenotypically distinct from one another and the EPS components do not follow the same localization patterns as the laboratory standard *P. aeruginosa* PAO1. When treated with aztreonam, LESlike4 exhibited an increase in EPS components that was not seen in LES400 or in PAO1. While these specific isolates share many of the same genes, each has a unique profile of SNPs and genetic elements that are likely responsible for the observed phenotypic diversity. A better understanding of the genotypic and phenotypic diversity of the LES isolates is necessary for the development of therapies able to eradicate the chronic infections they cause.

Curriculum Vitae: Kirsten 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 September of 2015.