



Announcement:

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

REBECCA AGGETT

on Wednesday, December 5, 2018 at 1:00 p.m. in SSC 1511

Thesis Title: Characterization of multifunctional enzyme complexes from *Comamonas testosteroni* KF1 and *Thermomonospora curvata* DSM43183 involved in steroid side chain degradation

Examination Committee:

Dr. F. Brauer, Dept. of Molecular and Cellular Biology (Exam Chair)

Dr. S. Seah, Dept. of Molecular and Cellular Biology

Dr. M. Kimber, Dept. of Molecular and Cellular Biology

Dr. A. Clarke, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. S. Seah (Adv)

Dr. M. Kimber

Dr. T. Akhtar

Abstract: The genes *fadI* and *fadJ* from *Comamonas testosteroni* KF1 are homologous to genes encoding the components of multifunctional enzyme complexes involved in fatty acid side chain β -oxidation. Both of these genes are located within the steroid degradation locus in the genome. FadJ had hydratase activity towards the 5-carbon side chain of cholic acid metabolite; however, gene knockout studies revealed no phenotypic changes in growth patterns. In the Actinobacterium *Thermomonospora curvata* DSM 43183, the genes *Tcur3480*, *Tcur3482* and *ltp2_{Tcur}*, located within a steroid side chain degrading operon, together encode a multifunctional steroid degrading enzyme complex. It was previously determined that the aldolase Ltp2_{Tcur} associates with the hydratase Tcur3480-Tcur3482 through the DUF35 domain, although the catalytic mechanism and kinetic parameters were unknown. The crystal structure of Ltp2_{Tcur}-DUF35 was solved and wild-type and mutant variant kinetic parameters were determined to support a proposed, novel retro-aldol catalytic mechanism involving two catalytic tyrosine residues.

Curriculum Vitae: Rebecca obtained her Bachelor of Science (Hons.) at the University of Guelph in June 2016, and then began her M.Sc. in the lab of Dr. Stephen Seah the fall of that same year.