ANNOUNCEMENT: Interested members of the University Community are invited to attend the Final Oral Examination for the Degree of Master of Science of

Laura Kell

of the Department of Molecular and Cellular Biology on Friday, December 4, 2015 at 2:00 p.m. in SSC 1511

Thesis Title: Characterization and investigation of novel inhibitory compounds of O-acetyltransferase A (OatA) from Staphylococcus aureus

Examination Committee: Dr. M. Baker, Dept. of Molecular and Cellular Biology (Chair)
Dr. A. Clarke, Dept. of Molecular and Cellular Biology
Dr. R. Merrill, Dept. of Molecular and Cellular Biology
Dr. C. Whitfield, Dept. of Molecular and Cellular Biology

ABSTRACT

Laura F. Kell, B.Sc. (Hons.) Advisor: Dr. A. Clarke

O-Acetylation of the N-acetyl muramic acid residue of peptidoglycan (PG) prevents the hydrolysis of the cell wall by autolysins and muramidases and is an important virulence factor in many bacteria. O-Acetylated PG aids in the survival of these bacteria within the host environment while preventing detection and clearance. O-Acetyltransferase A (OatA) has been identified as the enzyme responsible for this modification in Gram-positive bacteria. This study aims to expand our understanding of the O-acetylation of PG, and identify inhibitors of OatA from S. aureus to demonstrate OatA as a potential antibacterial target. Presented here are the kinetic parameters of pseudo-substrate donors and the first direct evidence of a Ser-His-Asp catalytic center of OatA. High-throughput screening has led to the identification of a class of compounds, coumarins, which show promising inhibitory properties in vitro. This research represents the first steps in providing evidence that OatA is a prospective pharmacological target.

CURRICULUM VITAE:

Laura graduated with an Honours BSc in Biochemistry and Biotechnology from Wilfrid Laurier University in 2013, completing an undergraduate research thesis under Dr. Joel Weadge. She joined the lab of Dr. Anthony Clarke in September of 2013 for her MSc in Molecular and Cellular Biology.