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*

ROBYN RALPH

on Friday, November 23, 2018 at 1:30 p.m. in SSC 1511

Thesis Title: **Characterization of *Autographa californica* nucleopolyhedrovirus immediate early protein ME53: the role of conserved domains in BV production, viral gene transcription, and evidence for ME53 presence at the ribosome**

Examination Committee:

Dr. Fred Brauer, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. S. Wootton, Dept. of Pathobiology
Dr. P. Krell, Dept. of Molecular and Cellular Biology
Dr. R. Lu, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. S. Wootton (Adv)
Dr. P. Krell (Co-Adv)
Dr. B. Meng
Dr. S. Graether

Abstract: The baculovirus AcMNPV early/late gene *me53* is required for efficient budded virus production and is well conserved in all alpha and betabaculoviruses. ME53 localizes to different subcellular regions during infection including the cytoplasm at early times, the nucleus at late times, and is found at discrete foci at the plasma membrane during very late times post infection. The 449-amino acid ME53 contains several highly conserved functionally important domains including two putative C4 zinc finger domains (ZnF-N and ZnF-C) whose cysteine residues are 100% conserved. Although both regions have canonical consensus sequences for zinc finger domains, the domains' interaction with zinc remains uncharacterized. A purpose of this study is to confirm the presence of two zinc binding domains in ME53, as well as determine their role in virus infection and viral gene transcription. Interestingly, ZnF-C deletion results in an early delay of BV production from 12 to 18 hours post transfection correlating to ME53's cytoplasmic localization. Cytoplasmic functions at early times post-transfection may include translational regulation, which is supported by yeast-2-hybrid data that ME53 interacts with the host 40S ribosomal subunit protein receptor for activated C kinase (RACK1). RACK1 is a scaffolding protein that is also incorporated into the 40S ribosomal subunit as a mediator of translation initiation. In this study the association of ME53 with the ribosomes of virus infected cells was also investigated through polysome analyses.

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