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*

ANASTASIA SMART

on Friday, January 26, 2018 at 1:30 p.m. in SSC 1511

Thesis Title: **Characterizing the hnRNP Q complex and its activity in asymmetric neural precursor cell division during cerebral cortex development.**

Examination Committee:

Dr. A. Bendall, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. J. Vessey, Dept. of Molecular and Cellular Biology
Dr. T. Van Raay, Dept. of Molecular and Cellular Biology
Dr. M. Perreault, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. J. Vessey (Advisor)
Dr. T. Van Raay
Dr. J. Uniacke

Abstract: The development of the cerebral cortex is reliant upon the collaborative efforts of a wide variety of molecular mechanisms, one of which is the ability of neural precursor cells (NPCs) to undergo asymmetric cell division. Asymmetric cell divisions produce two daughter cells with distinct identities, one NPC and one neuron. The identity of each daughter cell is decided by the unequal distribution of cell fate determinants. This imbalance is created by the partitioning of RNA:protein complexes to an intracellular site for localization. As a result, the post-mitotic translation of localized transcripts dictates the relative abundance of cell fate determinants and thus, daughter cell identity. Heterogeneous nuclear ribonucleoproteins (hnRNPs) are a family of RNA-binding proteins with diverse functions. This research aimed to characterize the hnRNP Q complex and its activity in asymmetric NPC division. The postnatal expression profile revealed hnRNP Q expression persists beyond embryonic development into the immediate postnatal period. Inhibiting nuclear export in NPCs and isolating the hnRNP Q complex via co-immunoprecipitation indicated hnRNP Q shuttles in and out of the nucleus and is capable of forming nuclear and cytoplasmic complexes, suggesting hnRNP Q is involved in splicing, localization and translational repression. Finally, *in vivo* knockdown experiments replicated *in vitro* findings that revealed altered patterns of NPC division that show a bias towards self-renewal.

Curriculum Vitae: Anastasia obtained her B.Sc. Hons (Major in Psychology, Brain & Cognition) at the University of Guelph in Fall 2015. She then began her M.Sc. (Neuroscience Specialization) in the lab of Dr. John Vessey in January 2016.