



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

COLE ANDERSON

on Thursday, April 19, 2018 at 1:30 p.m. in SSC 1511

Thesis Title: Investigating a role for phospholipids in plastid pleomorphy.

Examination Committee:

Dr. M. Baker, Dept. of Molecular and Cellular Biology (Exam Chair)

Dr. J. Mathur, Dept. of Molecular and Cellular Biology

Dr. I. Tetlow, Dept. of Molecular and Cellular Biology

Dr. J. Colasanti, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. J. Mathur (Adv)

Dr. I. Tetlow

Abstract: Plastids, the defining feature of plants, have been observed producing stroma-filled extensions or tubules known as stromules. Although stromules are reliably induced upon exogenous sucrose treatment and inhibited upon silver nitrate treatment, a clear mechanism and function behind this phenomenon remains to be elucidated. The lack of inorganic phosphate appears to effect stromules levels as well as simultaneously causing a conversion of extra-plastidic membrane lipids from phospholipids to galactolipids suggesting a lipid-based mechanism for their formation. Non-specific phospholipase C 4 and non-specific phospholipase C 5, while responsible for this conversion, do not affect stromule formation. The origin of plastidial phosphatidylcholine upstream of phospholipid to galactolipid conversion is likely due to the presence of plastid associated membranes and does not play a role in stromule formation. The observations from my microscopy-based studies demonstrate the organelle pleomorphy influencing ability of lysophosphatidylcholine, implicating acyl-editing, better known as the Lands cycle, in stromule formation.

Curriculum Vitae: Cole obtained his Bachelor of Science (Hons.) at the University of Guelph in April 2015 (Environmental Science). In September 2015, he began his M.Sc. in the lab of Dr. Jaideep Mathur.

Publications: Delfosse, K., Wozny, M. R., **Anderson, C. J. J.**, Barton, K. A. and Mathur, J. (2017). Evolving views on plastid morphology. In *Concepts in Cell Biology- History and Evolution* (ed. Sahi, V. P., and Baluska, F.) Chapter 10, New York, Springer.

Delfosse, K., Wozny, M. R., Jaipargas, E. A., Barton, K. A., **Anderson, C. J. J.**, and Mathur, J.(2016). Fluorescent protein aided insights on plastids and their extensions: A critical appraisal. *Frontiers in Plant Science*. 6:1253. doi: 10.3389/fpls.2015.01253