



COLLEGE OF BIOLOGICAL SCIENCE
Department of Molecular and Cellular Biology

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

Richard Preiss

of the Department of Molecular and Cellular Biology
on Wednesday, April 26, 2017 at 1:30 p.m. in SSC 3317

Thesis Title: **Autophagy Gene Overexpression in *Saccharomyces cerevisiae* for Accelerated Sparkling Wine Production**

Examination Committee: Dr. M. Brauer, Dept. of Molecular and Cellular Biology (Chair)
Dr. G. Van der Merwe, Dept. of Molecular and Cellular Biology
Dr. R. Mullen, Dept. of Molecular and Cellular Biology
Dr. R. Mosser, Dept. of Molecular and Cellular Biology

ABSTRACT

Richard Preiss B.Sc. (Hons.)

Advisor: Dr. George Van der Merwe

Traditional sparkling wines are the product of carbonation and aging of a base wine with yeast in the bottle, where yeast cell compounds are released over time which contribute to flavour and appearance. This often lengthy process is known as autolysis. Our lab identified several proteins related to autophagy that result in autolysis when overexpressed. Overexpression of autophagy-related genes *ATG3* and *ATG4* in industrial wine yeast was found to be a suitable strategy to accelerate cell death and autolysis of wine yeast during nitrogen starvation. We also found that that *ATG3* and *ATG4* overexpression has pleiotropic ramifications: reduced turnover of autophagic cargo, vacuolar fragmentation, abnormal accumulation of lipids, and accelerated generation of ROS, all of which precede cell death and likely contribute to the impaired response to nitrogen stress. These results work toward solving an important industrial problem, as well as furthering our understanding of autophagy regulation during starvation.

CURRICULUM VITAE:

Richard obtained his BSc. (Hons.) Microbiology from the University of Guelph in the summer of 2014, and began his MSc. in Dr. George van der Merwe's lab in Fall 2014.

Publications and Awards:

Bauer I, Brune T, **Preiss R**, Kölling R. Evidence for a non-endosomal function of the *Saccharomyces cerevisiae* ESCRT-III like protein Chm7. **Genetics**. 2015;201: 1439–1452.

Ontario-Baden Württemberg Summer Research Program (OBW-SRP) Scholarship, S13.