



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

MONIKA JESIONOWSKA

On Thursday, March 3, 2022 at 9:30 a.m. (online)

Thesis Title: Investigating interactions between *Vitis riparia* Open Stomata 1 (OST1) and Inducer of CBF Expression (ICE) proteins

Examination Committee:

Dr. Joseph Yankulov, Dept. of Molecular and Cellular Biology (Exam Chair)

Dr. Annette Nassuth, Dept. of Molecular and Cellular Biology

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

Dr. Yang Xu, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. Annette Nassuth (Co-Advisor)

Dr. Robert Mullen (Co-Advisor)

Dr. Ian Tetlow

Abstract: Freezing tolerance in plants often increases due to activation of the ICE-CBF pathway. A key activator of this pathway is Inducer of CBF Expression 1 (ICE1), which is positively regulated by Open Stomata 1 (OST1) through phosphorylation following cold stress. The phosphorylated ICE1 activates the CBF-COR transcription cascade, resulting in gene expression associated with increased freezing tolerance. While studied extensively in the model plant, *Arabidopsis thaliana*, much is still unknown about the functions of OST1 homologues in other plant species, such as economically important grape varieties (highly susceptible to freezing injury). Through fluorescence microscopy and co-immunoprecipitation experiments, this thesis aimed to investigate the OST1-ICE association from a highly frost tolerant grape, *Vitis riparia*. The results of these experiments suggest that VrOST1 interacts with all VrICE proteins regardless of its phosphorylation state and presence of the C-terminal putative interaction domain. These findings can broaden our understanding of the *Vitis* CBF pathway.

Curriculum Vitae: Monika completed her BSc (Hons.) in Plant Science at the University of Guelph in Winter 2019. She began her MSc of Molecular and Cellular Biology in the lab of Dr. Nassuth in Fall 2019.

Awards: Eastern Regional Director's Award (November 2020) for presentation given at the Canadian Society of Plant Biologists, titled "Exploring protein-protein interactions within the ICE-CBF-COR pathway of *Vitis riparia*"