



**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*

**MAUDE BELANGER**

**On Wednesday, October 5, 2022 at 2:00 p.m.** (SSC 1511)

**Thesis Title:** Temporal regulation and subcellular localization of alkaline/neutral invertase of developing *Zea mays* endosperm: insights into sugar signaling and carbon allocation in cereal grains

**Examination Committee:**

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

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

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

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

**Advisory Committee:**

Dr. Ian Tetlow (Co-Advisor)

Dr. Jaideep Mathur (Co-Advisor)

**Abstract:** Sucrose is the main form of transportable carbohydrate in plants. Sucrose production, transport and breakdown is central to plant growth and development and carbohydrate storage. Sucrose hydrolysis occurs via two enzymatic pathways, sucrose synthase and invertase (INV) and is essential for directing carbon into various metabolic pathways and for sugar signaling. Two different families of INV exist based on their pH optima and subcellular localization, acid INV and alkaline-neutral INV (A/N-INV). A/N-INV have been a lot less studied in comparison to acid INV. In this study, gene expression was used to identify temporal regulation of 10 maize A/N-INV isoforms in developing maize seeds. Localization of INVAN8, a plastidial form of A/N-INV, using isolated plastids and characterization of a recombinant INVAN8 protein were performed to unravel a new function of A/N-INV in carbon metabolism of non-photosynthetic plastids (amyloplast) of developing maize endosperm.

**Curriculum Vitae:** Maude completed her B.Sc. (Hons.) in Biochemistry and Molecular Medicine at the Université de Montréal in May 2020. She then began her M.Sc in Molecular and Cellular Biology in Fall 2020 under the supervision of Drs. Ian Tetlow and Jaideep Mathur.