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*

AMY HOFF

on Monday, December 7, 2020 at 9:30 a.m. (online)

Thesis Title: **Possible binding partners of glutathione transferase theta 1**

Examination Committee:

Dr. Jasmin Lalonde, Molecular and Cellular Biology (Exam Chair)
Dr. David Josephy, Molecular and Cellular Biology
Dr. Wei Zhang, Molecular and Cellular Biology
Dr. Jennifer Geddes-McAlister, Molecular and Cellular Biology

Advisory Committee:
Dr. D. Josephy (Co-Advisor)
Dr. M. Coppolino (Co-Advisor)
Dr. W. Zhang

Abstract: Glutathione transferase (GST) enzymes are found in all kingdoms of life. The human genome encodes more than a dozen cytosolic GST enzymes. The best characterized biological role of these enzymes is their catalytic activity: conjugation of glutathione with electrophiles, a process which inactivates many toxic chemicals. Additionally, several GST enzymes participate in cell signaling processes, mediated by protein binding interactions. This thesis focuses on human GST theta 1. A large fraction (30-40%) of the human population is homozygous null for the *GSTT1* gene, but the consequences of this polymorphism remain unclear. I have searched for possible protein binding partners of GSTT1 through a pull-down assay with protein lysates from cultured human prostate cancer cells as well as human red blood cells, followed by mass spectrometry-based proteomic analysis. I have identified Histidine Triad Nucleotide Binding Protein-1 (HINT1) as a binding partner. HINT1, a member of the HIT superfamily of nucleotide hydrolases and transferases, catalyzes the hydrolysis of PSI-7851, a hepatitis C drug; the protein is also known to be a tumor suppressor. An interaction between GSTT1 and HINT1 may point towards a previously unknown biological role of this GST.

Curriculum Vitae: Amy completed her Bachelor of Science (Hons.) at the University of Waterloo in 2017, as well as the Biotechnology Technician (fast-track) Diploma program at Conestoga College in 2018. She began her M.Sc. in the lab of Dr. David Josephy in the spring of 2018, and later added the collaborative specialization in Toxicology to her graduate studies.