



**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*

JORDAN KOGUT

On Wednesday, August 16, 2023 at 1:30 p.m. (SSC 2315)

Thesis Title: The molecular mechanisms of glycolytic enzyme palmitoylation

Examination Committee:

Dr. Yang Xu, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. Shaun Sanders, Dept. of Molecular and Cellular Biology
Dr. Ray Lu, Dept. of Molecular and Cellular Biology
Dr. Melanie Alpaugh, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. Shaun Sanders (Advisor)
Dr. Ray Lu

Abstract: Neuronal axons can be over a meter long, making the efficient transport of proteins, organelles, and vesicles a challenge. Axonal transport is critical for neuronal function and trafficking deficits are prevalent in neurodegenerative disorders. Glycolytic enzymes provide the energy required for transport and are attached to fast transport vesicles that are propelled by motor proteins. But how do these soluble, cytosolic enzymes attach to fast moving vesicles? I discovered that a post-translational modification, palmitoylation, may hold the answer. I hypothesized that palmitoylation acts as a tether, attaching the enzymes to transport vesicles where they provide "on-board" energy for transport. I found that 8/10 glycolytic enzymes are palmitoylated. I pinpointed the palmitoylation site of GAPDH at cysteine 247 and observed a decrease in vesicle localization of palmitoylation deficient GAPDH. Unlocking the mechanisms behind this process not only improves our understanding of neuron function, but also has the potential to shed light on complex behaviors like learning and memory.

Curriculum Vitae: Jordan completed his Bachelor of Science (Hons.) in Neuroscience at the University of Guelph in April 2021. He began his Master of Science program in Molecular and Cellular Biology in the lab of Dr. Shaun Sanders in September 2021.

Awards: CBS Graduate Tuition Scholarship (2021); Natural Sciences and Engineering Research Council Canada Graduate Tuition Scholarship – Masters (2022), runner up for best poster presentations at both the University of Guelph Neuroscience Day and at the international FASEB Protein Lipidation conference in Vermont, USA (August 2022).

Publications: Andrey A Petropavlovskiy*, **Jordan A Kogut***, Arshia Leekha*, Charlotte A Townsend*, Shaun S Sanders (*Denotes equal contribution). (2021). A sticky situation: regulation and function of protein palmitoylation with a spotlight on the axon and axon initial segment. *Neuronal Signal*. 5(4)