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*

JAROD MORGENROTH-REBIN

On Monday, January 9, 2023 at 1:30 p.m. (SSC 1511)

Thesis Title: **Towards the characterization of putative degradation targets of *Klebsiella pneumoniae* Lon protease by quantitative proteomics and *in vitro* degradation assays**

Examination Committee:

Dr. Jaideep Mathur, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. Jennifer Geddes-McAlister, Dept. of Molecular and Cellular Biology
Dr. Siavash Vahidi, Dept. of Molecular and Cellular Biology
Dr. Matthew Sorbara, Dept. of Molecular and Cellular Biology

Advisory Committee:

Dr. Jennifer Geddes-McAlister (Advisor)
Dr. Siavash Vahidi
Dr. Chris Whitfield

Abstract: *Klebsiella pneumoniae* is an opportunistic bacterial pathogen, possessing numerous virulence factors to adapt to harsh host environments. Lon is an ATP-dependent serine protease in *K. pneumoniae* and was recently discovered to have a potential role in iron homeostasis. To identify potential targets of Lon impacting iron-homeostasis, this study used quantitative proteomics to identify proteins with significantly increased or decreased abundance binding to Nickel-Nitriloacetic acid agarose in the presence or absence of hexahistidine-tagged Lon. Candidate target proteins were purified and tested against Lon *in vitro* for degradation. Our results identified further links between Lon and iron-related proteins, while also uncovering a strong connection between Lon and sulfur metabolism/amino acid synthesis proteins in the Cys family. Overall, this work begins to test the potential interactions between Lon and proteins involved in iron homeostasis and uncovers a potential new role for Lon in sulfur homeostasis.

Curriculum Vitae: Jarod completed his Bachelor of Science (Hons.) in Biology with the Microbiology specialization and Chemistry minor at the University of Waterloo in 2020. That same year, he began his Master of Science program in Molecular and Cellular Biology at the University of Guelph in the lab of Dr. Jennifer Geddes-McAlister.