

Department of Molecular and Cellular Biology  
**Graduate Seminar MCB\*6500**

Friday, February 26, 2021 @12 p.m.

*presented by:*

**Jarod Morgenroth-Rebin**

*(Advisor: Dr. Jennifer Geddes-McAllister)*

**“Potential Lon protease degradation targets in *Klebsiella pneumoniae* under iron-limiting conditions”**

*Klebsiella pneumoniae* is an important nosocomial pathogen worldwide and the subject of many current studies due to its wide array of defensive mechanisms, virulence factors and ability to adapt to unfavourable conditions. Its ability to develop multi-drug resistance, as well as recently emerging hypervirulent strains amplify its importance as a secondary infection commonly seen in hospitals. *K. pneumoniae* undergoes changing gene expression to increase survival when it encounters harsh environments, and one of the most important limiting micronutrients to bacteria is iron. In order to achieve iron homeostasis under iron-limiting conditions, *K. pneumoniae* produces many protein products, altering protein abundance within the cell and in the extracellular environment through secretion of proteins. Lon protease is a globally acting, non-specific protease produced through transcription of the gene *lon* that was previously identified as being highly produced and secreted in iron-limiting conditions. To further study *K. pneumoniae*'s response to iron-limiting conditions, research is aimed at discovering novel degradation targets of the Lon protease in the secretome of *K. pneumoniae*. In this proposal, Lon protease, in addition to previously identified candidate degradation targets (ie. YfeC, YjgB, AegA and CysI), will be isolated and purified in order to test the ability of Lon to degrade these secreted proteins. Following this, phenotypic analysis of *K. pneumoniae* overexpression strains of candidate degradation targets will be performed under iron-limiting and iron-replete conditions to further characterize Lon proteases activity in the extracellular environment under iron-limiting conditions.