

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, February 5, 2021 @12:45 p.m.

presented by:

Boyan Liu

(Co-Advisors: Dr. Jennifer Geddes-McAllister and Dr. Rebecca Shapiro)

**“Proteomic analysis for potential protein targets
in wheat pathogen *Fusarium graminearum*”**

The fungal pathogen, *Fusarium graminearum*, is a major causative agent in disease *Fusarium* Head Blight (FHB) of cereal crops such as wheat (*Triticum aestivum*). This disease poses threat to agriculture production and public health, as it decreases crop kernel filling and contaminates products with mycotoxins such as deoxynivalenol (DON) and its derivative 15-acetyldeoxynivalenol (15-ADON). The 15-ADON-producing strain of the fungal pathogen is threatening Ontario agriculture. The current prevention methods are with limits, and FHB is becoming more severe due to climate change; thus, it is vital to research the host-pathogen interaction for new prevention approach. Because of the advance made in studying the interaction between host and pathogen with the bottom-up mass-spectrometry-based proteomics, I propose a project on determining potential protein targets involved in the infection of *T. aestivum* by *F. graminearum* using the quantitative proteomic analysis. The procedure starts with inoculation of 15-ADON-producing *F. graminearum* onto both FHB-resistant and susceptible wheat cultivars. Mass-spectrometry based proteomic analysis will then be applied to the samples for potential protein targets. I will generate mutant strain by knocking out the selected protein from the pathogen genome using the Uracil Specific Excision Reagent (USER) system. The severity of the mutant infection will be examined by inoculating the selected mutants onto the wheat cultivars. This workflow is replicable for future study on *F. graminearum* infection on cereal crops; it can help the researchers to develop new methods to combat the fungal pathogen.