

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, February 16, 2024 @ 12:00 p.m.

presented by:

Elizabeth Mallory

(Advisor: Dr. Emma Allen-Vercoe)

"Microbial ecological factors underlying *Melissococcus plutonius* infection in honey bees"

During 2023, there was a significant rise in the number of apiaries across Ontario diagnosed with severe European Foulbrood (EFB) infections. EFB is a major honey bee disease caused by *Melissococcus plutonius*, which affects larvae and is highly lethal. Recently discovered 'atypical' clonal complex (CC) *M. plutonius* strains have been isolated from Canadian outbreaks and differ drastically in their virulence mechanisms and biochemical properties compared to the 'typical' CC strains. CC identity does not fully explain the rising, severe outbreaks; presence of other EFB-associated bacteria, such as *Paenibacillus alvei* and *Enterococcus faecalis*, have been proposed to influence EFB outcomes as well. We aim to elucidate the possible link between *M. plutonius* CC and the microbial ecological factors underlying differential virulence. This research will use co-culture growth curves to measure the affect of EFB-associated bacteria presence on *M. plutonius* strain vitality spanning all CCs. Additionally, in vitro larvae survival assays will be completed to see how co-infections across CCs alter EFB disease severity and progression. By considering both strain differences with respect to CC identity, as well as the influence of other EFB-associated bacteria on the ability of these *M. plutonius* strains to cause disease, a greater understanding of EFB will emerge, leading to much needed novel strategies for disease control and lower colony loss.