

Department of Molecular and Cellular Biology
Graduate Seminar MCB*7500

Friday, February 2, 2024 @ 12:00 p.m.

presented by:

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"The screening and development of antimicrobial compounds against *Clostridium perfringens*, the causative agent of necrotic enteritis in broiler chickens "

Clostridium perfringens-induced necrotic enteritis caused by the production of the NetB toxin is a global problem that places a considerable burden on the commercial poultry industry. *Bacillus* strains that can produce antimicrobial peptides or compounds are promising probiotics that can be used to control the colonization of *C. perfringens* in broiler chickens. An SH3b peptide, IPHG88 from *Bacillus amyloliquefaciens* has previously been isolated from *Bacillus* and found to inhibit the growth of *C. perfringens*. I hypothesize that this peptide binds to *C. perfringens* peptidoglycan and inhibits enzymes that are involved in cell wall synthesis and remodelling. Binding assays with purified IPHG88 and isolated *C. perfringens* peptidoglycan will be employed to assess this hypothesis. IPHG88 tagged with a fluorophore will be used to determine if the peptide localized to the cell wall of *C. perfringens*. Pull-down assays using IPHG88 as a bait and the cell-free extract of *C. perfringens* will be employed to determine which *C. perfringens* peptidoglycan modifying enzymes interact with IPHG88. Since netB expression is controlled by quorum sensing, compounds produced by *Bacillus* strains will also be screened for those that can disrupt quorum sensing in *C. perfringens*. The development of these alternative strategies to combat necrotic enteritis will reduce the reliance on antibiotics and prevent the development of antibiotic-resistant bacteria.