

Department of Molecular and Cellular Biology  
**Graduate Seminar MCB\*7500**

Friday, May 24th, 2024 @ 12:45 p.m.

*presented by:*

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

**"Discovery of bioactive molecules from mollusks for  
inhibition of *Cryptococcus neoformans* biofilm  
formation"**

*Cryptococcus neoformans* is a fungal pathogen that causes the life-threatening condition cryptococcal meningitis, which is a leading cause of death in HIV/AIDS patients, with 118,000 deaths annually. Available antifungals for fungal infection clearance are scarce and resistance to these drugs has extended worldwide, making it difficult to overcome fungal diseases such as cryptococcosis. Moreover, antifungals such as amphotericin B and fluconazole exert intense selection pressure towards resistance due to their fungicidal and fungistatic effects, highlighting the importance of developing new antifungal drugs. However, *C. neoformans* relies on the production of critical virulence factors (e.g., polysaccharide capsule, biofilms, extracellular enzymes) to infect the host providing; these traits are an opportunity to disarm the pathogen by attacking the production of such virulence factors without exerting intense selective pressure. In this sense, biofilm formation causes persistent cryptococcal infections and colonization of medical devices or the brain, enhancing resistance to the host immune response and antifungal therapies. Targeting *C. neoformans* biofilm formation is an approach that allows the treatment of cryptococcosis without exerting selection for antifungal resistance development. This research proposal aims to discover bioactive molecules from mollusks that exert antibiofilm activity against *C. neoformans*. Thereby, proteins involved in the *C. neoformans* biofilm formation will be targeted for inhibition by proteins/peptides from mollusks' aqueous extracts, and secondary metabolites will be tested for bioactivity against the cryptococcal biofilm formation.

