BiophysTO Lunchtime Seminar Series

Date
Thursday, Nov 16th, 2021
12:00 – 1:00 pm

Host: James Otis

Heather Pinkett, PhD

Department of Molecular Biosciences
Northwestern University

ABC Transporters: Nutrient Uptake and Pathogenesis

Proteins located in the cell membrane work as gatekeepers to selectively allow compounds into or out of the cell. Such gatekeepers are known as or ATP-binding cassette (ABC) transporters, because they use the energy of ATP (adenosine triphosphate) hydrolysis to transport compounds across the cell membrane. We are interested in (1) How ABC transporters use specific and sometimes interchangeable components of the transport system to transport substrates? (2) How has the mechanism of substrate selectivity evolved to allow for promiscuous substrate transport? Bacterial ABC importers are essential for organism survival, controlling the rate of uptake for nutrients scavenged from the bacterium's environment. Control of the rate of transport precludes over-accumulation of a nutrient that is beneficial at low concentrations, but is potentially toxic at high concentrations. Our results provided new insights into organisms that use multiple transport systems to regulate nutrient influx of a range of substrates. Defining the molecular mechanism that controls nutrient uptake also allows us to understand how multicomponent transport systems work in concert to recognize and circumvent the host innate immune response, a mechanism crucial to the evolution of antimicrobial peptide (AMP) resistance in pathogenic bacteria.

Zoom Link: https://utoronto.zoom.us/j/81078949463

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