

Department of Molecular and Cellular Biology  
**Graduate Seminar MCB\*6500**

Friday, April 5th, 2024 @ 12:45 p.m.

*presented by:*

**Emma Pearen**

*(Advisor: Dr. Nina Jones)*

**"Investigating the role of Nectin-2 in human kidney podocytes"**

Podocytes are terminally differentiated and highly specialized epithelial cells that surround the glomerular capillaries. These cells serve as a crucial component of the glomerular filtration barrier in the kidneys. The most striking feature of podocytes is their complex network of actin-rich cytoplasmic extensions, called foot processes. Between adjacent foot processes lies a unique intercellular junction known as the slit diaphragm, which acts as a selective barrier that allows water and small solutes to pass into the renal tube while preventing proteins from exiting the bloodstream. Aberrant signalling at the slit diaphragm and podocyte focal adhesions results in foot process effacement and irreversible podocyte loss, leading to the development and progression of chronic kidney disease. Understanding the molecular mechanisms that regulate these signalling events is crucial in developing novel therapies to treat chronic kidney disease. The Jones lab has recently identified the cell adhesion molecule Nectin-2 as a novel podocyte-associated protein through its interaction with the adaptor protein Dok1. In this project, I seek to investigate the role of Nectin-2 in the human podocyte. Given that Nectin-2 is known to play a role in maintaining tight junctions and adherens junctions through its regulation of the actin cytoskeleton, we hypothesize that Nectin-2 plays a role in cell adhesion and actin cytoskeleton reorganization in human podocytes. To test this hypothesis, I aim to investigate and characterize the functional consequences of the interaction between Nectin-2 and Dok1 and to investigate the functional consequences of Nectin-2 knockout in human podocytes.