

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, June 16, 2023 @12:45 p.m.

presented by:

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"Investigating the role of adapter protein ShcD in the oligodendrocyte lineage"

Cells within the central nervous system can be divided into two major classes: neurons and glia. Oligodendrocytes are members of the glial cell family and produce myelin sheaths that surround the axons of neurons and are essential to neuronal function. Myelin provides the insulation required for efficient action potential propagation and neuronal communication, while also providing an interface for oligodendrocytes to provide trophic support to neurons. Mature myelinating oligodendrocytes are derived from their precursors, oligodendrocyte progenitor cells (OPCs), through a complex differentiation process. This process is regulated by various growth factors and neurotrophins, which rely on intracellular signaling to facilitate a cellular response. Disruptions to prototypical function of oligodendrocytes, or their precursors, has well established pathological implications, such as those seen in the demyelinating disease, multiple sclerosis.

The adapter protein ShcD is involved in various receptor tyrosine kinase mediated pathways, including tropomyosin receptor kinase (Trk) and epidermal growth factor receptor (EGFR) mediated cascades. These pathways are of particular interest in the oligodendrocyte lineage as their activation has established effects on OPC proliferation, cell survival, myelination, and remyelination following damage. ShcD has been shown to be highly expressed within the oligodendrocyte lineage, particularly in OPCs, however, an understanding of its role in these cells is yet to be elucidated. We will address this current gap in understanding by investigating the role of ShcD in processes of OPC proliferation and maintenance, differentiation, and myelination to better characterize the functional significance of ShcD in the oligodendrocyte lineage.