MCB Senior Seminar Series

Thursday, July 19, 2018 at 4:30 p.m. at The Fifth

Christopher Kuc (M.Sc. candidate, Vessey lab)

Seminar Title: Investigating the role of Staufen1 in asymmetric neural precursor cell divisions in the developing cerebral cortex

Background: Proper development of the cerebral cortex relies on asymmetric divisions of neural precursor cells (NPCs) to produce a recurring NPC and a differentiated neuron. Asymmetric divisions are promoted by the differential localization of cell-fate determinants, such as mRNA, between daughter cells. Staufen 1 (Stau1) is an RNA- binding protein known to localize mRNA in mature hippocampal neurons. Its expression pattern and role in the developing mammalian cortex remains unknown.
Results: Upon characterization, Stau1 mRNA and protein were found in all cells of the developing murine cortex and all stages investigated. Stau1 protein was observed in the nucleus, cytoplasm and distal processes of NPCs and newly born neurons and shuttles between the nucleus and cytoplasm. Upon shRNA-mediated knock-down of Stau1 in primary cultures of the developing cortex, we did not observe any changes in cell differentiation. They were able to both self-renew and generate neurons in the absence of Stau1 expression. However, in vivo knockdown of Stau1 indicates a role in anchoring of NPCs to the ventricular zone.
Conclusion: We propose that Stau1 is not required for neurogenesis, but is important for anchoring NPCs to the ventricular zone.

Hayley Thorpe (M.Sc. candidate, Vessey lab)

Seminar Title: Investigating the role of heterogeneous nuclear ribonucleoprotein Q (hnRNP Q) on postmitotic neuronal morphology in the cerebral cortex

Abstract: Heterogeneous nuclear ribonucleoproteins (hnRNPs) constitute a family of RNA-binding proteins (RBPs) capable of regulating mRNA dynamics and protein translation through post-transcriptional modifications. One such protein, hnRNP Q, is highly expressed in the murine neocortex during the peak neurogenic period, though its role in cortical development has yet to be fully delineated. As many RBPs have known roles in neurogenesis and because previous studies suggest hnRNP Q may regulate several aspects of neuronal morphology, we believe hnRNP Q is associated with the development of newly born cortical neurons. We knocked down hnRNP Q in immature cortical neurons in vitro; preliminary results indicate that knockdown of this protein increases dendritic complexity and reduces the colocalization of pre- and postsynaptic protein markers. This suggests that hnRNP Q may be necessary for dendritogenesis, synapse formation and subsequent neurotransmission in the cortex.

Please join us!

Free appetizers!