

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, Oct. 12, 2018 in SSC 1511 @ 12:45 p.m.

presented by:

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(Advisor: J. Vessey)

“Elucidating the role of heterogeneous nuclear ribonucleoprotein K in asymmetric neural precursor cell divisions of the developing cerebral cortex”

Proper embryonic development of the cerebral cortex is necessary for a variety of higher order cognition functions, while dysregulated development can result in the presentation of neurological diseases. Neurogenesis within the developing cortex occurs as a result of the asymmetric divisions of neural precursor cells (NPCs), known as radial glial cells. These asymmetric divisions lead to the production of two uniquely fated daughter cells, one that will remain in a precursor state and another that will differentiate into a neuron. The identity of the fated neuronal daughter cell is determined by the unequal inheritance of fate determinants, such as mRNA or protein during division. The transcription, translation, and localization of mRNA fate determinants can be controlled by various families of RNA-binding proteins, such as the heterogeneous nuclear ribonucleoproteins (hnRNPs). Specifically, hnRNP-K has not only been shown to play a role in mRNA biogenesis but has been linked to known fate determining proteins. Additionally, aberrant hnRNP-K expression has been identified in Kabuki syndrome, a neurological disorder characterized by cortical atrophy and ventriculomegaly. I propose the study of hnRNP-K in the asymmetric cell divisions of NPCs during the development of the cerebral cortex in a murine CD1 model. I predict hnRNP-K plays a role in the regulation and localization of fate determining mRNAs during the asymmetric cell divisions of NPCs during cortical development. The proposed study aims to investigate the temporal and spatial expression of hnRNP-K throughout cortical development, as well as the effect of hnRNP-K knockdown on cortical expansion.