

# College of Science Neuroscience Faculty Candidate

**Robert Krencik, Ph.D.**  
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**Tuesday, December 01, 2015**  
**VBI 145**  
**3:00pm – 4:00pm**

## **“Exploration into Astrocellular Origins of Human Neurological Disorders”**



What are the underlying causes of cognitive impairments in human neurodevelopmental disorders (NDDs)? Unraveling the contributing mechanisms at the cellular level will lead to novel methods for disease prevention, regeneration and re-induction of cortical plasticity. Based on my research utilizing human pluripotent stem cells and transgenic models, I propose that neural stem cell development and neuronal function are interconnected by the temporal precision of astrocyte-derived signals. Astrocytes are one of the highest abundant cells in the nervous system, yet their functions are still unclear. Does altered timing of synaptogenesis and excitatory to inhibitory balance during postnatal learning in NDDs originate from shifted astroglial maturation? A second focus of my laboratory is to investigate astrocyte heterogeneity throughout the nervous system as an exciting new frontier to identify signals that uniquely affect function of various neuronal populations, including those involved in Parkinson's disease and amyotrophic lateral sclerosis. Are astrocytes intrinsically tuned to these neuronal cell types for promoting degeneration or regeneration during disease? As an independent investigator, my long-term research goal is to use innovative technologies to elucidate cellular mechanisms in astroglial subtypes that orchestrate proper neuronal function as a means to thwart neural dysfunction.

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