

BIOENGINEERING SEMINAR

FALL 2021

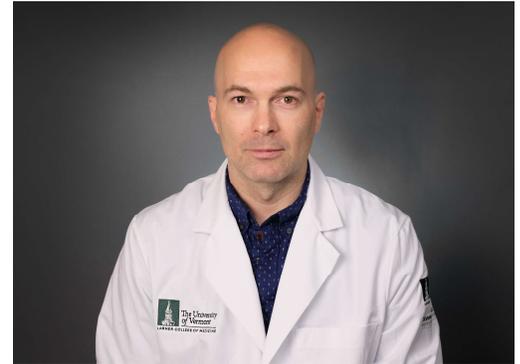
The Assay of Spatial Cognition in Models of Pediatric Encephalopathy

Abstract

Brain circuits that underpin spatial processing, incorporating the hippocampus and several cortical and subcortical structures, wire together at key stages of early development. Our goal is to understand how genetic or acquired encephalopathic insults to the developing spatial circuit lead to corresponding deficits in navigation, and the encoding or recall of spatial information. Rodent models of both Early-Life Seizure (ELS) and the Pten knockout model of Autism Spectrum Disorder (ASD) exhibit morphological and electrophysiological changes within the hippocampal circuit that correlate with spatial deficit. The extent to which these changes alter hippocampal throughput, the temporal coordination of CA1 pyramidal cell action potentials, and coherent communication with the neocortex, may serve as potential biomarkers of cognitive outcome and suggest novel treatment avenues. Finally, we will discuss the use and possible caveats of optogenetic pacing of the septo-hippocampal circuit to offset learning and memory deficits caused by encephalopathic temporal discoordination.

Biography

Dr. Barry hails from Eastern Canada, where he did an undergraduate degree in Psychology at St. Francis Xavier and a Master's degree in Biopsychology at Memorial University. He then did a PhD in Neural and Behavioral Science with Dr. Bob Muller at SUNY Downstate, where he first studied place cell activity in relation to learning and memory. He then did his first post-doc with Andre Fenton and Todd Sacktor in the Furchgott center for Neural and Behavioral Science where he began using place cell activity as a proxy measure for the biochemical basis for the stability of memories. Dr. Barry then transitioned to translational neuroscience at Dartmouth Hitchcock Medical Center, working with Dr. Gregory Holmes on the study of spatial cognitive comorbidities of Early-Life Seizure. Dr. Barry is now an Assistant Professor of Neurological Sciences at the University of Vermont, employing a systems neuroscience approach toward the neurophysiological basis of spatial learning and memory as well as the origins of cognitive deficits that accompany acquired and genetic encephalopathies.



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**Thursday, November 18
12:00-1:00 pm**

Join Zoom Meeting:

gmu.zoom.us/j/91001788853?pwd=enZXRlXFNlG1zdk5NN1VM5WtnQlJMUT09

Meeting ID: 910 0178 8853
Passcode: 229574