NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering

Graduate Seminar

Dr. Travis Baker

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Center for Molecular and Behavioral Neuroscience
Rutgers Newark

November 10 (Fri)
11:30am - 1:00pm
CKB 217

Advancements in quantifying and modulating neural circuit dysfunction in substance use disorder

Abstract:

Recent advances in our understanding of the neurobiological underpinnings of substance use disorders (SUD) and the effects of non-invasive brain stimulation (NIBS) open new avenues for improving the efficacy of treatment protocols. Identifying and quantifying neural circuits and proximal functions can define new targets for NIBS, tailor NIBS protocols for specific circuits and dysfunction, and more objectively measure the efficacy and outcome of NIBS. These advances add both to our understanding of the dysfunctions of SUD and the mechanisms of action of NIBS. In this talk, I will present findings of recovery of reward function associated with the midcingulate cortex as indexed by electrophysiological measures in human problematic substance users. I will also describe recent advances in virtual and augment reality as a mean to investigate these processes in the real world.

About the Speaker

The overarching goal of Dr. Baker's research program is to understand the neurobiological mechanisms that underlie cognitive control and memory, how to empirically identify and characterize these functions in the brain, and how these functions are disrupted in clinical populations (e.g. addictions, ADHD, affective disorders, neurodegenerative disorders). He has adopted a variety of empirical approaches to investigate these functions, including genetics, electroencephalography, event-related brain potentials, functional magnetic resonance imaging, diffusion magnetic resonance imaging, and transcranial magnetic stimulation. Ultimately, Dr. Baker hopes that his research will converge to help improve psychiatric care. Born in Canada, Travis Baker earned his PhD in 2012 from the University of Victoria in the Brain and Cognitive Science program under the supervision of Dr. Clay Holroyd. He also holds a Masters of Science degree in Experimental Neuropsychology (University of Victoria) and received a B.A. (with distinction: Psychology) from Vancouver Island University. Prior to joining Rutgers University faculty, he worked as a post-doctoral fellow at the Montreal Neurological Institute in the Department of Neurology and Neurosurgery under the supervision of Dr. Alain Dagher, and at CHE Sainte-Justine Children's Hospital Research Center under the supervision of Dr. Patricia Conrod.