

“Neuroethology of Prosocial Communication and Learning in Rodents”

by

Dr. Robert C. Liu
Emory University

Date: 22 December 2016 (Thursday)

Time: 3:00pm to 5:00pm

Venue: B4702, 4/F, Academic 1, City University of Hong Kong

Abstract

There is an increasing appreciation that mental health disorders often include social-specific deficits, motivating research into the neurophysiological mechanisms that underlie natural, social behaviors in mammals. Information about other individuals is constantly being acquired, assessed and learned from cues emitted during social interactions. However, our understanding about processing and plasticity mechanisms for sensory cues has generally come from studies of nonsocial contexts, leaving a gap in our knowledge about their relevance in social contexts. My lab has been addressing this gap by applying a computational neuroethological paradigm to investigate social-sensory information processing and plasticity in robust, natural rodent social behaviors. In this talk, I will first review recent work about sensory cortical plasticity when maternal mice learn the natural, behavioral meaning of a category of ultrasonic vocalizations emitted by pups – findings that were unexpected based on prior auditory cortical plasticity studies from nonsocial contexts. I will then present new research investigating neural activity underlying social interactions in the monogamous prairie vole, a premier animal model for elucidating the neural bases for prosocial bonding. Exploiting both electrophysiological and optogenetic methods, our results provide the first dynamic view of corticostriatal processes involved in bond formation, revealing how social interactions recruit reward systems to drive changes in affiliative behavior.

About the Speaker

Dr. Robert C. Liu is a Winship Distinguished Research Professor (2014-2017) and Associate Professor in the Department of Biology at Emory University. He received his PhD in Applied Physics from Stanford University for his theoretical and experimental work in condensed matter physics before transitioning into neuroscience as a Sloan Postdoctoral Fellow at the University of California, San Francisco’s Center for Theoretical Neurobiology. He trained there with Christoph Schreiner, Michael Merzenich and Kenneth Miller in sensory systems and computational neuroscience, and began a neuroethological program of research in sensory systems. Upon arriving at Emory University, he initiated the Computational Neuroethology Laboratory to study the mechanisms of sensorineural processing and plasticity in more natural, social behavioral contexts. His auditory research investigates how hierarchical auditory cortical processing changes as species-specific communication sounds acquire behavioral meaning, using a mouse model wherein maternal mice learn the significance of the ultrasonic vocalizations of pups. His work further expanded through a collaboration with Dr. Larry Young at Emory’s Yerkes National Primate Research Center to study neurophysiological mechanisms of social bonding in monogamous prairie voles.

Contact

Prof. Jufang He (3442-7042, jufanghe@cityu.edu.hk)

Mr. Edward Lau (3442-5901, eduarlau@cityu.edu.hk)

Miss Janice Leung (3442-4902, janice.leung@cityu.edu.hk)

All are welcome