

SEMINAR SERIES

Supported by The Department of Biomechanics and
The Center for Research in Human Movement Variability (MOVCENTR)



Cortical Activity During Reactive Balance Reflect Perceptual, Cognitive, and Motor Function in Health, Aging, and Disease

Featuring Dr. Lena Ting
Emory University

...

Friday, Feb. 9 | 10:00 am – 11:00 am | BRB 167

PRESENTATION ABSTRACT

Engagement of *cortical* resources in balance control is an indicator of fall risk in older adults where people cannot “walk and talk” at the same time. However, there are few direct measures of cortical activity during balance control, and their relationship to balance and other brain functions is unclear. I will show evidence that various electroencephalography (EEG) measures of cortical activity during reactive balance recovery are associated with individual differences across perceptual, cognitive, and motor domains. Specifically, we focus on the N1 evoked response in balance perturbations, as well as beta oscillations prior to and in response to perturbations. Direct measures of cortical activity can stratify healthy young and older individuals without clinically identifiable impairment. Further, relationships between cortical activity and function differ as a function of age, balance ability, and neurological disorders such as stroke and Parkinson’s disease. The intersections across perceptual, cognitive, and motor domains may help identify complex mechanisms underlying balance function. Our findings suggest that direct measures of hierarchical balance control mechanisms could enable development of mechanistic, precision-medicine efforts aimed at fall prevention.

ABOUT DR. TING

Lena Ting a Professor and the McCamish Distinguished Chair in Biomedical Engineering at in the Coulter Department of Biomedical Engineering, at Georgia Tech and Emory and a Professor in Rehabilitation Medicine in the Division of Physical Therapy at Emory University. Dr. Ting directs the Neuromechanical Laboratory at Emory, focusing on complex, whole body movements such as walking and balance in healthy and neurologically impaired individuals, as well as skilled movements involved in dance and sport. Her work is highly interdisciplinary, drawing from neuroscience, biomechanics, rehabilitation, computation, robotics, and physiology. Her lab has developed several computational methods to characterize and understand individual differences in movement and movement control, and how these change in neurological disorders, as well as with rehabilitation and training. Dr. Ting also co-directs the Georgia Tech and Emory Neural Engineering Center and an NIH T32 in Computational Neural Engineering. Dr. Ting is a Fellow of the American Institute of Medical and Biological Engineers (2016), she was awarded the *Arthur C. Guyton Award for Excellence in Integrative Physiology* by the American Physiological Society (2007), the Atlanta Business Chronicles, Healthcare Hero Award (2018) and several teaching and mentoring awards from Georgia Tech and Emory University.

more info at cobre.unomaha.edu

*This seminar was supported by the National Institutes of General Medical Sciences of the National Institutes of Health under Award Number P20GM109090 Center for Research in Human Movement Variability. | The University of Nebraska at Omaha shall not discriminate based upon age, race, ethnicity, color, national origin, gender identity, sex, pregnancy, disability, sexual orientation, genetic information, veteran's status, marital status, religion, or political affiliation.

