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Toward Creating Novel Neurorehabilitation Strategies by Developing Newly Emerging Motor Coordination After Stroke

ABSTRACT:

Impaired, stereotypical motor coordination emerges during stroke recovery due to abnormal co-activation of muscles, a key contributor to motor impairment in over 7 million stroke survivors in the US. Spontaneous recovery does not fully resolve abnormal muscle coordination. Thus, there is a critical need to develop effective ways to reduce impaired muscle coordination for stroke recovery. Our previous studies show that under isometric conditions, stroke alters motor modules: coordinated patterns of muscle activity that flexibly combine to produce functional motor behaviors. The alteration depends on the severity of motor impairment in stroke survivors. Can we utilize the characteristics of muscle coordination in stroke survivors, different from that of the age-matched control subjects, to improve motor function of stroke survivors? What experiments can or should be done to test whether the characteristics of muscle coordination can be used to design new therapeutic protocols to improve motor function post-stroke? In this seminar, I will discuss the neuroscientific background of motor coordination in stroke survivors, present some preliminary data on modifiability of habitual intermuscular coordination, and propose how the nature of motor coordination can be utilized to improve movement quality in stroke survivors.



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BIOGRAPHY:

Dr. Jinsook Roh is an Assistant Professor in the Department of Biomedical Engineering at the University of Houston (UH), TX. Her research program is focused on understanding the neural mechanisms of motor coordination in healthy and pathological populations (esp. stroke) and translating resultant scientific findings to Neural Engineering and Neurorehabilitation (ex. developing novel therapeutic targets for stroke rehabilitation). She holds her graduate degree in Systems and Computational Neuroscience at Massachusetts Institute of Technology (MIT), with undergraduate Physics background.

Before joining the University of Houston, she completed a post-doctoral fellowship at Rehabilitation Institute of Chicago (the #1 rehabilitation research hospital for > 25 years in the US; currently name changed to Shirley Ryan AbilityLab) and at Northwestern University. She has implemented research projects to identify and characterize abnormalities in synergistic muscle coordination in stroke survivors. Dr. Roh was an American Heart Association Postdoctoral Fellowship awardee. She served Temple University as an assistant professor before moving to UH. Dr. Roh currently performs research projects supported by extramural funds supported by American Heart Association and NIH.