Investigator:	**Thomas Novak** Phone: (404) 728-5064 ext. 121187 Email: tnovak@emory.edu
Primary Research Interest:	Physiology
Description of Research:	The proposed research will enroll US Veteran's over 60 to investigate individual differences in behavioral and neural predictors of short-term skill retention in a serial reaction time task. Our previous work using off-line Transcranial Magnetic Stimulation (TMS) has shown an aging-related reduction in the dynamic range of motor cortical excitatory:inhibitory (E:I) balance. Here, we will measure change in E:I balance during an online motor sequence-learning paradigm, and quantify the relation between E:I change and individual differences in motor skill retention. My previous work has also shown that individual differences in motor adaptability (performing well across different tasks/ task difficulties) may predict learning outcomes, and thus this research aims to better stratify older individuals' by their capacity to adapt motor performance across a range of task demands, and quantify the relation between motor adaptability and learning performance. The goal of this research is to develop a clinically translatable line of research that improves the specificity of conventional learning and nuero-rehabilitative interventions based on the needs of the individual.
Relevance to VA:	Over half of the US Veteran population is at risk for motor declines due to their advancing age (over 60 years old). Motor learning and learning-induced cortical plasticity are critical to maintaining and recovering the motor skills necessary for functional independence in this population; however, conventional one-size-fits-all learning interventions have shown limited effect for a significant contingent of older adults. Thus, identifying more sensitive neural and behavioral markers that account for these individual differences in motor skill learning is necessary for a) improving individual risk stratification, and b) informing personalized intervention strategies to maximize rehabilitation outcomes.