

## **Dr. Daichi Shimbo**

The proposed Investigator Research Supplement will provide career development and research activities that will enable Dr. Diaz to establish an independent program of research. Dr. Diaz is an exercise physiologist whose long-term goal is to build highly productive, independently funded laboratory which incorporates randomized controlled trials to examine the beneficial effects of exercise and physical activity interventions in the prevention and treatment of cardiovascular disease, with a specific focus on vascular dysfunction and its co-morbidities. With aspirations of becoming one of the preeminent investigators in the field of exercise and physical activity-related research, Dr. Diaz has identified specific training areas in which more advanced training will allow him to accomplish this goal. As such, he has assembled a multidisciplinary team of mentors to provide training in: (1) exercise physiology and physical activity research methodology, (2) advanced study design and statistics, (3) research dissemination and transition to independence, and (4) education in the responsible conduct of research. For his research project, Dr. Diaz will utilize the existing infrastructure of the parent grant that incorporates a state-of-the-art, laboratory-based, randomized controlled experiment to primarily examine the acute effects of negative mood on endothelial function. Participants in the parent grant are randomized to an anger recall task, a depressed mood recall task, an anxiety recall task, or an emotionally neutral condition and have biomarkers of endothelial function measured at multiple time points before and after this mood induction task. Building off the parent grant, the primary aim of this Investigator Research Supplement is to investigate whether the adverse effects of negative mood on endothelial function are attenuated by higher levels of cardiorespiratory fitness and habitual physical activity. To address this aim, additional assessments are proposed for participants enrolled in the parent grant study including: (1) exercise testing and (2) 7-day accelerometry. Designed as a pilot study, Dr. Diaz will collect feasibility data for conducting exercise testing and 7-day accelerometry within the scope of a laboratory-based, randomized controlled experiment. These data will be used to inform screening, participation, and dropout rates and to test methods and procedures for Dr. Diaz's future R01 grant application wherein a larger and more focused laboratory-based study will be proposed to investigate the biological mechanisms through which physical activity may buffer the deleterious cardiovascular consequences of negative emotions. As the exposure to acute negative moods is highly prevalent in Western societies and has been linked to increased cardiovascular risk, Dr. Diaz's efforts in this Investigator Research Supplement may help to fill a pressing need for identifying effective preventive strategies that buffer against the harmful consequences of negative emotions.