NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering

Graduate Seminar

Dr. V. Sujith Sajja

Deputy Director,
Blast Induced Neurotrauma Branch,
Walter Reed Army Institute of Research

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11:30am - 1:00pm
CKB 217

Translating pre-clinical models of blast into clinics

Abstract:

According to the Department of Defense (DOD), of the 440,000 service members reported to have sustained traumatic brain injury (TBI) between 2000 and 2021, 82.3% of these injuries were classified as mild (mTBI) (TBICoE 2021). In order to understand the effect of relBOP that primarily occurs in training, the United States Congress mandated through the National Defense Authorization Acts (FY18 Sec 734, FY19 Sec 253 and FY20 Sec 716), that the DOD monitors, studies, and understand the effects of blast exposure from training and operations, and that the DOD include blast exposure history in medical records of members of the Armed Forces. While several studies have applied clinical and pre-clinical assessments to address relBOP symptomatological effects in training at an acute time-period (<24hours) after blast exposure, the inability to discern definitively identifiable changes using either current neuroimaging technologies or Food and Drug Administration (FDA)-approved diagnostics that are specific for relBOP is a main impediment for monitoring Warfighter readiness and return-to-duty status.

Single high or multiple low-level blast exposures have been linked to impairments of neurocognitive and neurosensory functions, prompting concern over the cumulative deleterious effects of blast and the need to define standards to mitigate this risk among Service Members. The majority of these overpressure exposures elicit sub-concussive symptomatology that is hard to diagnose and identify. In addition, there are currently no definitive mechanistic predictive injury outcome metrics that identify how much exposure is too much and how it might lead to long-term cognitive deficits. Our objective in this study was to conduct a comprehensive assessment of single and repeated blast exposure to understand injury thresholds for lung, brain and neurosensory systems using a rodent model of repeated blast exposures.

About the Speaker

Dr. Sajja has obtained PhD in Biomedical Engineering from Virginia Tech School of Biomedical Engineering working on blast induced neurotrauma. Followed by post-doc at John Hopkins in stem cells and MRI application of Blast. In addition to Dr. Sajja's duties as a Deputy Director of the branch, he has been working at Walter Reed Army Institute of Research over past 8 years as a principal investigator studying effects of blast trauma on various organ systems and assessing PPE. Dr. Sajja has over 45 peer reviewed publications and 100+ conference abstracts/presentations and is a receipt of Department of the Army Civilian Service Achievement Medal award.