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**Yeona Kang\*** (yeona.kang@howard.edu), 204 Academic Service Building B, Washington, DC 20059, and **Keith Jamison, Rayan Lowder, Nicholas D Schiff, Amy Kuceyeski and Sudhin A Shah.** *Alteration of neuronal integrity underlying executive attention impairments following traumatic brain injury: PET study utilizing [11C] Flumazenil.* Preliminary report.

Chronic deficiencies in executive attention have been demonstrated after Traumatic Brain Injury (TBI). Very little is known regarding the biology and mechanism underlying this impairment. There is a critical need for quantitative and integrative approaches that can identify and measure the neuronal damage. This study was measured functional neuronal integrity within the anterior forebrain mesocircuit with [11C] flumazenil (FMZ) PET and evaluate its relationship to impaired executive attention. 8 TBI patients and 20 healthy control (HC) had a dynamic FMZ-PET imaging. 16 anterior mesocircuit regions were considered as cortical regions of interest. FMZ-Binding was calculated by the simplified reference tissue model with the pons as a reference. We found there is no significant differences between the populations for volume fraction and cortical thickness but there were differences in the FMZ-binding. Individual scores of attention were predicted ( $R^2=0.55$  in executive attention and  $R^2 =0.77$  in mean reaction time). Therefore, a lower than normal FMZ-binding was present in subjects of TBI, indicating loss of neuronal integrity. These results demonstrate the feasibility of detecting altered neuronal integrity in post-acute TBI using a novel molecular imaging tool of FMZ-PET. (Received September 14, 2020)