Garth Terry, MD, PhD, is a clinical-research psychiatrist and VA Career Development Award (CDA) 2 recipient at the VA Northwest Network Mental Illness Research, Education, and Clinical Center (MIRECC) at VA Puget Sound in Seattle, and Assistant Professor in the Departments of Psychiatry and Behavioral Sciences and Radiology at the University of Washington School of Medicine (UW). He completed undergraduate studies at Haverford College (Haverford, PA) with majors in chemistry and music, and was subsequently employed at Merck & Co. as a radiochemist where he was responsible for the pre-clinical production of novel and established positron emission tomography (PET) radioligands for their CNS drug development program. He completed his medical degree at The George Washington University School of Medicine and Health Sciences, and a PhD in the Graduate Partnership Program at the National Institutes of Mental Health (NIMH) in conjunction with the Karolinska Institute (KI), Department of Clinical Neuroscience. Under the co-mentorship of Robert Innis, MD, PhD (NIMH) and Christer Halldin, PhD (KI), recognized world experts in the fields of CNS PET radioligand development and implementation, his thesis focused on the translational development and validation of one the first highly selective, highly specific radioligands for the cannabinoid CB_1 receptor. Through this combination of experiences, Dr. Terry's expertise spans nearly all aspects of PET CNS research including radiochemistry, PET imaging of rodents and non-human primates, first-in-human studies, human research using PET, and pharmacokinetic modeling of PET studies. During residency training at UCLA, Dr. Terry provided scientific and medical support to multiple clinical trials through the National Institute of Drug Abuse (NIDA) Clinical Trial Network (CTN). He continued his clinical research training with a fellowship at the MIRECC at VA Puget Sound and supported human research studies at VA Puget Sound and Madigan Medical Center at Joint Base Lewis McChord. These studies have primarily involved use of prazosin for post-traumatic stress disorder (PTSD) and comorbid disorders in Veterans and active duty Servicemembers. Dr. Terry is currently principal investigator of his CDA 2 funded translational study, exploring the potential of molecular-based biomarkers for imaging neuroinflammation in Veterans following blast mild traumatic brain injury (mTBI). He is also serving a leading role as Co-Investigator of a $4.5 million Congressionally Directed Medical Research Program (CDMRP) project with the goal of developing a novel PET radioligand for imaging the alpha-1a adrenoceptor in human brain.

Dr. Terry's presentation at the APA's Research Colloquium for Junior Psychiatrist Investigators was entitled, "FDG-PET as a Clinical Diagnostic Biomarker for Repetitive Blast Mild Traumatic Brain Injury." Blast-induced mild traumatic brain injury (mTBI) is the "signature injury" of the wars in Iraq and Afghanistan. Explosive blasts account for 70-88% of mTBIs sustained in those conflicts, with affected Servicemembers (SMs) usually experiencing multiple blast mTBIs. Persistent postconcussive symptoms (PCS) following mTBI can lead to substantial disability and distress and are sometimes attributed to common comorbid conditions such as posttraumatic stress disorder (PTSD) and depression. Currently there is no "gold standard" for clinical diagnosis of mTBI, and so accurate and reliable identification of Veterans and SMs with history of blast mTBI remains a critical unmet need.

By definition mTBI does not result in neurostructural changes detectable on routine clinical neuroimaging, such as CT or MRI. However, imaging brain metabolism using [^{18}F]fluorodeoxyglucose (a radioactive molecule similar to glucose) with positron emission tomography (FDG-PET) may be more sensitive for detecting alterations in brain function following mTBI than structural imaging. Preliminary data suggest that FDG-PET may perform as an objective and high-performance biomarker for blast-mTBI, independent of PTSD symptoms and multiple other comorbid or confounding factors. In 79 combat Veterans with retrospectively recalled repetitive mTBI caused by blast compared with 41 control participants with no lifetime history of TBI, an unbiased analytical approach identified a focused brain region, the left pallidum (an area deep inside brain), with high between-group significance ($p < 0.0001$). Left pallidum FDG-PET had excellent performance in separating those who had a history of blast mTBI, and those who did not. Thus, FDG-PET of this region performs as a sensitive and specific biomarker for blast mTBI, and correlates with the number of blast mTBIs, executive behavioral dysfunction, and memory impairment.

Based on these results, Dr. Terry and his colleagues plan to follow up with a prospective study to determine if FDG-PET has diagnostic potential for identifying Veterans and Servicemembers who have had multiple blast mTBIs and persistent postconcussive symptoms, and if these findings are specific to blast mTBI as opposed to impact mTBI. An objective biomarker with neuroimaging may provide researchers and clinicians a method of distinguishing symptoms that overlap PCS from those of common comorbid conditions, such as

PTSD and depression, identify those who may be at risk for future neurodegenerative disorders, and provide a useful tool for development of novel therapeutics or treatments for PCS and the consequences of blast mTBI.