Sabbatical Report

1. B. Christopher Frueh, Ph.D., Professor of Psychology, CAS, University of Hawaii, Hilo, HI

2. Sabbatical Period: Fall 2016 (August to December 2016)

3. Sabbatical Objectives and Activities:

Personalizing psychiatric treatment recognizes that for reasons of genetic makeup and personal history the brain responds differentially to specific treatments; poor response to one treatment does not necessarily imply poor response to others or deny the possibility of potentiation through combinations of two or more treatments. Unfortunately, clinical trials with necessarily rigid protocols traditionally designed take place within a very limited timeframe cannot provide sufficient information in relation to individual responses to specific treatments and treatment combinations.

In order to achieve this we must be able to reliably predict differences in benefits or indeed iatrogenic harm based on personalizing factors that could include: (1) social characteristics, (2) clinical characteristics (e.g. patterns of symptoms or co-occurring/comorbid conditions), (3) health factors (age, lifestyle, pathophysiology), (4) biomarkers (circulating biomarkers, somatic mutations), (5) biomarkers provided by structural and functional neuroimaging data, (6) genetic and epigenetic variations (drug metabolism, drug transport, drug targets) and (7) drug interactions. The understanding of genomic, epigenomic, environmental and pathophysiological factors alongside a better understanding of drug interactions, the identification of novel biomarkers including circulating DNA, miRNAs, proteins/peptides will become increasingly important for personalized medicine.

My current research with psychiatric patients (at the Menninger Clinic in Houston, TX, at Virginia Tech in Roanoke, VA, New York University in NYC, and University of Central Florida, Orlando, FL) provides a unique position to develop biomarkers and personalized treatment algorithms for a range of psychiatric disorders commonly presenting with chronic course and relatively poor long term outcomes. My research focuses on identifying the combination of therapies that maximize the likelihood of cure defined as, a 1-year resiliency from mental disorder (symptoms and functional status) for 85% of patients with complex, treatment-refractory neuropsychiatric disorders. This approach to science, harnesses modern biological and statistical techniques to radically alter the course of disease in each individual person we treat.

My research includes:

1. Clinical trials with combat veterans with posttraumatic stress disorder (PTSD) and depression.

2. Longitudinal treatment outcomes (6-8 weeks) and one-year follow up for psychiatric inpatients.
3. **Exploring the medical and psychological status of Special Forces military personnel** on active duty and retired to better understand their healthcare needs and begin to develop multi-component strategies to help maximize their performance and functioning while on duty and after retirement.

4. Large-scale data mining to identify biopsychosocial-markers of severity and treatment non-response that may be clinically actionable.

   a. Efforts to discover actionable biomarkers (fMRI) to aid in treatment of individuals with treatment refractory neuropsychiatric disorders. Early findings include **identified specific resting state markers of substance abuse, suicidal ideation**, and **treatment non-response**.
   
   b. Efforts to enhance our understanding of the genetic underpinnings of severe psychiatric disorders and treatment outcomes.

This sabbatical provided me protected time to spend at various research sites, including Virginia Beach, VA, Washington, DC, and Houston, TX to work intensively with various clinical and research teams.

4. **Sabbatical Objectives were met, with the following scientific deliverables:**

**Publications**


Presentations


5. Frueh BC. (2017, May). The VA system’s disability policies are tragically iatrogenic. Invited talk presented at the American Enterprise Institute symposium titled “From war to work: Saving veterans from the disability trap,” Washington, DC.


5. Contributions to my professional development, university, and field:

The sabbatical provided me with protected time to read and write without distraction, to travel to work closely with colleagues in the field, and to complete a wide range of projects. These publications contribute to the advancement of the mental health field, and reflect well on the university.

Finally, one outcome not described above is the development of a specialty focus research and treatment program at Houston Methodist Hospital for the special operations community (operators and families members) that I have designed and will contribute to in the years ahead.