Postdoctoral Fellowship Description: RESEARCH FOCUS

Title: Postdoctoral Fellowship in COBRE Center for Neuromodulation

APA-accredited: Yes

Site: Butler Hospital

Supervisor(s): Benjamin Greenberg, MD PhD (Primary Supervisor)
Linda Carpenter, MD (Secondary Supervisor)
Noah Philip, MD (Secondary Supervisor)
Jennifer Barredo, PhD (Secondary Supervisor)

Description of Site:

The Butler COBRE Center for Neuromodulation (CCN) is directed by Dr. Benjamin Greenberg MD PhD and Linda Carpenter MD, with focus on supporting the next generation of neuromodulation researchers who will use cutting-edge tools to promote understanding of and treatments for neuropsychiatric disorders. The newly established CCN, together with the existing infrastructure of the Butler Neuromodulation Research Facility (BNRF), provide an outstanding environment in terms of research resources and intellectual collaboration. The CCN is located at Butler Hospital in Providence, affiliated with the Alpert Medical School of Brown University; a number of CCN members also have primary affiliations with the Providence VA and/or various Brown University Departments. The CCN includes several Cores to support the work of the center, including an Administrative Core, a Neuromodulation & Neuroimaging Core, and a Data Analysis Core. This postdoctoral position will be primarily associated with the Neuromodulation and Neuroimaging Core, but with interface with all the other cores. CCN researchers include individual project leaders and pilot project awardees, most of whom will utilize neuroimaging and brain stimulation methods across a variety of projects investigating different questions and a range of neuropsychiatric disorders with the ultimate goal of developing or improving new therapeutic approaches. Additional staff in the CNN include research assistants, study coordinators, administrative assistants, and other ancillary staff. Three current CCN Project Leaders are using functional MRI (fMRI) and noninvasive stimulation techniques to understand mechanisms of disease and mechanisms of brain stimulation. The broader neuromodulation and neuroimaging environments include a large number of Brown faculty members with related expertise who add tremendously to the overall scientific environment.

The Butler CCN is affiliated with and supported by Butler Hospital, the Carney Institute of Brown University, and the Department of Psychiatry and Human Behavior (DPHB) in the Alpert Medical School of Brown University. Within the Brown Medical School, the DPHB participates in joint research and clinical training programs with other Medical School departments, including Family Medicine, Obstetrics/Gynecology, Neurology, Neurosurgery, Medicine, and Pediatrics, as well as the campus-based Departments of Public Health; Neuroscience; Cognitive, Linguistic and Psychological Sciences; Pharmacology and Engineering (Biotechnology). One of the greatest strengths of the Department is the collaborative work fostered across disciplines, as well as between clinicians and researchers. Research activities conducted by DPHB faculty include close to 200 ongoing studies funded by more than 50 external sources such as the National Institute of Mental Health (NIMH), National Institute of General Medical Sciences (NIGMS), National Cancer Institute (NCI), Veterans Affair (VA), Department of
Defense (DoD), National Institute of Child Health and Human Development (NICHD), National Institute on Drug Abuse (NIDA), National Institute of Alcohol Abuse and Alcoholism (NIAAA), the National Center for Complementary and Integrative Health (NCCIH). Butler Hospital is a 137-bed private, Brown University-affiliated, freestanding psychiatric hospital in Providence with research portfolio representing more than $15 Million annually in external research funding. Butler is a member of Care New England, a larger network of hospitals in Rhode Island. The Carney Institute for Brain Science at Brown is a research community united under the common goal of understanding how brain circuits generate and control complex behavior. The Carney Institute is committed to supporting research and facilitating collaborations in brain science across the Brown University community with a top priority to build upon collective successes of the research and educational excellence at Brown to generate funding for brain science.

**Fellowship Aims**

1. The fellow will have a broad post-doctoral research training experience related to the use of neuroimaging to understand brain changes resulting from noninvasive brain stimulation or underlying clinical changes associated with stimulation (i.e., mechanisms of action).

2. The fellow will gain a strong working knowledge of clinical trial and experimental methodologies that integrate neuroimaging and neuromodulation methods.

3. The fellow will be trained in the use of several noninvasive brain stimulation methods, including transcranial magnetic stimulation (TMS) and transcranial electrical current stimulation (tES).

4. The fellow will gain a strong working knowledge of evidence-based assessment of psychiatric disorders, symptoms, and related illnesses.

5. The fellow will actively participate in research activities, including grant writing, data collection, management and analysis, and development and implementation of research protocols, with the goal of presenting research results at national meetings and writing peer-reviewed manuscripts.

**Fellowship Timeline**

This is a two-year fellowship, renewable after one-year contingent upon satisfactory progress. The anticipated start date is May – September of 2020.

**Research Activity Plan**

The fellowship is a clinical research position. The fellow will be exposed to various aspects of research in the area of neuroimaging and neuromodulation via participation in ongoing investigations of the CNN and data analyses. The fellow will participate in the following activities.

**Imaging analysis:** Under the supervision of Noah Philip, MD and Jennifer Barredo, PhD, the fellow will serve as a project contributor and provide support for the imaging analyses related to behavior and structural connectivity changes associated with transcranial magnetic stimulation (TMS) or transcranial direct current stimulation (tDCS) interventions in CCN projects involving clinical samples. Responsibilities will include quality control review of existing data, performance of preprocessing and data analyses. The fellow may be engaged to varying degrees in other investigations (ongoing or planned) conducted by Brown-affiliated faculty using CCN resources. (50%)

**Writing/submitting research proposals and grants and manuscript preparation and submission:** The fellow will be provided with a series of focused readings to increase knowledge in the areas of neuromodulation
and neuroimaging in clinical populations. The fellow will have the opportunity to contribute toward outgoing grant preparation/submissions. The fellow may serve as co-investigator or lead investigator on CNN pilot award projects or other projects in the BNRF related to mechanisms (of therapeutic effects or other actions) of noninvasive stimulation and neuropsychiatric symptoms or disorders. The fellow will also be encouraged to develop their own grant ideas and submit a grant proposal by the end of the fellowship term. The fellow will be encouraged to collaborate on manuscript preparation and poster submissions at national conferences. A number of datasets are currently available that will facilitate manuscript preparation. Individually tailored goals will be established in this area. (20%)

E-field modeling: The fellow will become familiar with the use of software to neuronavigate TMS and for modeling effects of noninvasive brain stimulation with different montages, and provide consultative support to CNN researchers with these tools. (5%)

Education: Under the supervision of Linda Carpenter, MD the fellow will receive training in the administration of neuromodulation techniques and in turn support the educational mission of the CCN by facilitating the training of other neuromodulation research community members. (5%)

The fellow will participate in weekly research meetings focused on his/her own research progress and development, discussion of relevant literature, and ongoing review of goals and plans. (5%)

Review of and training in application of brain stimulation techniques, including transcranial direct current and magnetic stimulation (tDCS, TMS), respectively. The fellow will be provided with an opportunity for hands-on learning about how to administer non-invasive brain stimulation under physician supervision (5%)

Clinical Activity Plan
This position is not explicitly designed to support a path toward licensure. However, opportunities for clinical experience will be considered based on availability and goals of the postdoctoral fellow. Should clinical activities be added, they would be in areas that complement fellowship content area, and would not exceed 15% time over two years (i.e., 4-6 hours per week based on a 40-hour week). In this circumstance, a supervisor appropriate to the discipline of the postdoctoral fellow would need to be identified and the clinical effort would be subtracted from responsibilities outlined as part of the Research Activity Plan.

Path toward licensure: YES____ NO_X__

Didactics
Postdoctoral Seminars: The fellow will participate in the following postdoctoral seminars through the Brown Post Doctoral Training Program. (10% time)

Mandatory Didactics:
Core Seminars (1 per month)
DPHB Academic Grand Rounds (1 per month)
Clinical Ethics – if intending to sit for licensure (1 per month)

Optional Didactics (Mandatory for T32/F32/ and Investigator Funded Fellows):
Academic Friday – Grantsmanship seminars, Special Topics in Statistics
Supervision and Evaluation
The progress and performance of the fellow will be evaluated through interactions with CCN Supervisors and feedback from CCN Project Leaders and other CNN investigators that interact with the fellow. The fellow will and have weekly individual meetings with COBRE Core Directors involved in his/her training. Research mentoring is also readily available from CCN Director Dr. Benjamin Greenberg and from various other CCN-affiliated faculty. The fellow will participate in regularly scheduled progress meetings to assess attainment of goals and further research development plans, and he or she will also attend regular CCN weekly or BNRF meetings. Drs. Carpenter or Greenberg or an appropriate designee (as determined by Dr. Greenberg) will provide clinical supervision as indicated.

Every 6 months for the duration of the fellowship, the fellow and the supervisors will provide formal evaluations, and evaluations of the program relative to the goals and learning objectives of the fellowship.

Resource Requirements
Fellow will be provided with the following resources at Butler Hospital:
- Access to space to complete research responsibilities
- A computer and project-specific software
- Internet access
- Telephone

Reporting and approval
This fellowship will be part of the Adult track. The position will be discussed and is contingent on approval by the Adult track faculty in their monthly meeting on 4/2019.

Postdoctoral Track Coordinator

Director, Research Fellowship Program

Director, Postdoctoral Fellowship Training Program