Patient-oriented Research Repository

Patient-oriented Research Project Description

Project Title: Task-based Functional Brain Networks involved in Hallucinations and Delusions in Schizophrenia

Project PI: Professor Todd Woodward

Start and End Dates: **2020-01-15** to **2020-05-15**

Position Type: ☐Paid $(/hr) Click here to enter text. ☒ Volunteer

Hours per Week: 10-15 hours/week

Number of Openings: 1

Clinical Research Area: Psychiatry

Location: Cognitive Neuroscience of Schizophrenia Laboratory (CNoS) - BC Mental Health and Substance Use Services, BC Children's Hospital Research Institute

Experience Level: ☒BSc ☒MSc ☒MD ☐PhD ☐MD-PhD ☐PDF

Keywords: Schizophrenia, delusions, hallucinations, functional neuroimaging, cognition, statistical methodology

Project Description:

The proposed work will apply advanced multivariate methodology to comprehensive, internationally shared data sets in order to generate new insights into functional brain networks as they relate to delusions and hallucinations in schizophrenia. Emerging task-based brain networks can be anatomically identified based on core anatomical “signatures”. They can also be assigned a cognitive function, based on their BOLD response to the implemented experimental conditions. Finally, the relation to the symptoms of schizophrenia can be determined by statistical methods used to study the overlap between individual differences in two data sets; namely, in this case, brain imaging data and measurement of symptoms of schizophrenia. This initiative will contribute to ongoing research with the following goals (1) anatomical identification of a novel set of task-based brain networks detectable with fMRI; (2) delineation of the function of each network; (3) specification of how dysfunction in these networks contributes to hallucinations and delusions in schizophrenia. Internationally shared fMRI data sets will be analyzed using in-house software that will generate new insights into the workings of these functional networks, thereby contributing to a biological understanding of the symptoms of schizophrenia. The lab focuses on functional neuroimaging and cognitive neuropsychiatry. We are committed to developing a cognitive and biological understanding of the symptoms of schizophrenia, and translating this information back to people with schizophrenia so that they will better understand their illness, and through this insight, be better able to cope with their symptoms.

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Application Instructions:

Candidates should contact Chantal Percival (Research Assistant) at cnos.lab@ubc.ca.

Please send over the following documents:

- Resume
- Cover letter
- Transcript

Outline the specific tasks and activities the student will be responsible for.

The specific tasks the trainee will be responsible for include: data coding and entry into large SPSS data sets, assisting research staff with neuroimaging data acquisition, learning how to read functional brain images, uploading them to our in-house software for data analysis, running the in-house software, creating reports on the results, and re-running the software using different analysis methods. This position requires a low to moderate level of independent work. Direct supervision will be given by the Research Coordinator and Research Assistants.

Provide examples of how the student will gain practical experience in patient-oriented research.

This position provides a unique opportunity to gain exposure to clinical, neurological, and experimental aspects of schizophrenia research in a high-paced, productive research lab. The PI is working on multiple studies that integrate the use of functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) technology to identify brain regions associated with some of the symptoms commonly experienced in schizophrenia and psychosis. In addition to neuroimaging, clinical interviews and therapeutic interventions are currently being administered and evaluated to determine if there is an impact on positive symptoms, such as hallucinations and delusions, as a result of group therapy participation. This position compliments classroom learning by providing real-world experience in concepts covered in research methodology courses. Experience working with fMRI and EEG equipment will provide the student with an opportunity to explore and develop a greater understanding of the latest research techniques currently used in the area of neuroscience. The opportunity to work with research participants with and without a mental illness will provide a greater insight into how neurocognition is evaluated empirically and how to work compassionately with research subjects. The trainee will be trained in data entry using SPSS and fMRI data analysis. Opportunities for training in EEG data analysis may also be provided to exceptional candidates. The trainee will also be trained to assist with EEG and fMRI data collection with healthy controls and individuals with psychosis. The opportunity to independently run EEG and fMRI research sessions may also be provided to exceptional candidates.

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Describe how the student's role will benefit the project.

The student's role will benefit the project by assisting with valuable data collection and entry for analysis. Analyses conducted by the student will generate new insights into task-based functional brain networks detectable with fMRI, as well as the delineation of the function of each network. This project will contribute to the understanding of how dysfunction in these networks contributes to schizophrenia symptoms such as hallucinations and delusions, thereby paving the way for studies attempting to manipulate these brain networks through neuromodulation.

Describe how the trainee will be mentored by you and/or your group during their tenure.

The trainee will report directly to the Research Coordinator and work closely with research staff. The PI will be available to discuss projects and provide mentorship as needed. The trainee will be invited to attend lab meetings and presentations. All members of the research team will be available to the trainee to discuss areas where the trainee may wish to gain further experience. The trainee will be given an opportunity to work in a large, productive neuroimaging lab. There are opportunities to work with experimental and clinical psychologists, research associates, post-graduate students, graduate students, and international collaborators in the area of schizophrenia, neurocognition, and neuroimaging research. This will not only provide a great opportunity for networking, but will also provide the trainee with the experience necessary to move on to a graduate studies program working with a psychiatric population. There may also be opportunities for the trainee to connect with various mental health teams by assisting the Research Coordinator in recruitment presentations.