Study 675: Human Connectome Project for Early Psychosis

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Abstract:

The Human Connectome Project (HCP) was initiated to accelerate progress in understanding the organization of the human brain. To accomplish this goal, the original HCP Washington-University-Minnesota and MGH/Harvard-UCLA Projects have focused on acquiring and sharing data relevant to structural and functional connectivity in 1200 healthy twins and their siblings. The main aims have been to use advanced 3T imaging to develop advanced data acquisition and scanning sequences, to develop novel algorithms for post-processing of white matter fiber structure and brain connectivity, and to develop novel graphical techniques for brain connectomes. The purpose of the new funding opportunity announcement, PAR-14-281 for Connectomes Related to Human Diseases (U01), is to build upon the original HCP by extending it to the study of human brain diseases in order to acquire the same high quality data as in the original HCP, but with the goal of accelerating knowledge of brain diseases in a manner heretofore not possible. Importantly, progress has been slow and frustrating in translating knowledge of the brain to new and more effective treatments for human brain diseases such as severe mental disorders. In fact, severe mental disorders, which include psychotic disorders, are brain diseases that are not only devastating because they result in severe disruptions that occur early in life, but, for many, the course of illness is progressive, leading to chronic debilitation and early mortality. Thus the need to accelerate knowledge of dysfunctions in structural and functional brain connectivity in these disorders, and to translate this knowledge to treatment, is critical. The primary goal of the proposed Human Connectome Project on Early Psychosis is to acquire high quality data consistent with data acquired by the original HCP. To this end, we will acquire imaging data on Prisma 3T magnets at two sites, one in Boston and one in Indianapolis, using the HCP Lifespan Prisma protocol. This imaging protocol was developed to be of similar high quality to the original HCP, but with reduced scan time, the latter important in a psychosis cohort. We will also use behavioral measures from the HCP as well as additional measures specific to early psychosis. We will acquire blood to be stored at the Rutgers University Cell and DNA Repository (RUCDR)(Aim 1), and we will use the Washington University HCP post-processing pipeline to process imaging data (Aim 2). Additionally, we will include new imaging tools for signal drop detection, multi-tensor tractography, diffusion magnetic resonance imaging (dMRI) models, i.e., free-water imaging, and a new harmonization protocol for diffusion images (Aim 3). We will also perform, as a representative example, a study comparing brain networks of affective and non-affective psychosis groups with controls (Aim 4). The main goals are thus to acquire high quality imaging, behavioral, cognitive, and genetic data on an important cohort of early psychosis patients, in a manner consistent with the HCP, which will be made available to the research community for future studies. Such data will provide a unique opportunity to characterize the pathological substrates of early psychosis.

Study Cohorts:

Cohort # - Cohort Type - Cohort Name - Age From - Age To - Add'l Criteria (Subject Count):

#808 - Control - Cohort 3 - 192 - 432 - None (3839)
#809 - Baseline - Cohort 2 - 192 - 432 - None (1106)
#810 - Baseline - Cohort 1 - 192 - 432 - None (3235)

Cohort Hierarchy:

Cohort # - Name - Attribute

#808 - Cohort 3 - Medical Criteria\Healthy
#809 - Cohort 2 - Medical Criteria\Bipolar Disorder
Medical Criteria\Major Depressive Disorder
#810 - Cohort 1 - Medical Criteria\Delusional Disorder
Medical Criteria\Psychotic Disorder Not Otherwise Specified
Medical Criteria\Schizoaffective Disorder
Medical Criteria\Schizophrenia
Medical Criteria\Schizophreniform Disorder

Study Measures:

Primary Measures

cains01 - Clinical Assessment Interview for Negative Symptoms -CAINS
madrs01 - Montgomery-Asberg Depression Rating Scale
panss01 - Structured Clinical Interview for the Positive and Negative Syndrome Scale
ymrs01 - Young Mania Rating Scale

Secondary Measures

acpt01 - Auditory Continuous Performance Test
cgi01 - Clinical Global Impression (CGI)
deldisk01 - Delay Discounting Task
dccs01 - Dimensional Change Card Sort Test (DCCS)
fmhx01 - Family Medical History
flanker01 - Flanker Task
ses01 - Hollingshead Socioeconomic Rating Scale
image03 - Image
imagingcollection01 - Imaging Collection
mhx01 - Medication History
tlbx_emsup01 - NIH Toolbox Emotion Domain - Emotional Support Survey
tlbx_friend01 - NIH Toolbox Emotion Domain - Friendship Survey
tlbx_rej01 - NIH Toolbox Emotion Domain - Peer Rejection and Perceived Rejection Surveys
tlbx_perhost01 - NIH Toolbox Emotion Domain - Perceived Hostility Surveys
tlbx_wellbeing01 - NIH Toolbox Emotion Domain - Psychological Well-Being
self_effic01 - NIH Toolbox Emotion Domain - Self-Efficacy Survey
lswmt01 - NIH Toolbox List Sorting Working Memory Test
tlbx_motor01 - NIH Toolbox Motor Domain
orrt01 - NIH Toolbox Oral Reading Recognition Test
tpvt01 - NIH Toolbox Picture Vocabulary Test
tlbx_sensation01 - NIH Toolbox Sensation Domain
prang01 - PROMIS Anger
predd01 - PROMIS Emotional Distress - Depression
preda01 - PROMIS Emotional Distress-Anxiety
promisgl01 - PROMIS General Life Satisfaction

prsi01 - PROMIS Social Isolation
er4001 - Penn Emotion Recognition Task
pss01 - Perceived Stress Scale
presio01 - Pre-Session Questionnaire
fmriresults01 - Processed MRI Data
psychosocial01 - Psychosocial Interview
ndar_subject01 - Research Subject
scid_v01 - SCID-V Diagnosis
olfact01 - Seidman Olfactory Questionnaire
socdem01 - Sociodemographics
tbi01 - Traumatic Brain Injury
wasi201 - WASI-2

Study Type:

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\Observational\Arms/Comparison\Cohorts\Mixed
              \Description\Primary Purpose\Screening
              \Intervention\Behavioral\Questionnaires
              \Intervention\Procedure\MRI
              \Intervention\Procedure\fMRI
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Data Analysis:

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\Neuro Signal Recordings\Scanner\Siemens 3.0T Prisma MRI
                        \Software\Connectome Workbench
                        \Software\FSL
                        \Software\FreeSurfer
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Results:

Documents:

Data used in this study from other Collections:

Coll# - Collection Title - PI List