

Summer Research Openings

Opportunity with Dr. Tamar Green laboratory

Lab Mentor: Dr. Monica Siqueiros Sanchez

Project Title: Towards clinical translation of imaging studies in neurofibromatosis type 1

Project Description:

The Green lab takes a “genetics first” approach to understanding neurodevelopmental disorders by studying children with neurogenetic syndromes, specifically “the rasopathies”. Rasopathies are a collection of syndromes where genetic mutations affect the RAS pathway and result in multisystemic disorder, including measurable effects on behavior and cognition (e.g., deficits in cognitive and social skills). One of their projects focuses on one of these conditions, neurofibromatosis type (NF-1). Studies of NF1 show compelling evidence for abnormalities in structural MRI, whole-brain abnormalities in white matter microstructure, and resting-state fMRI. However, the usability of these effects as outcome measures is limited. Here, the aim is to utilize these three imaging modalities along with a battery of cognitive-behavioral assessments, to define a syndrome-specific profile of brain-based correlates that can serve as a set of sensitive markers for intervention effects

Key Words: MRI, neurogenetic syndromes, ADHD

*If this type of research interests you and you would like to participate or just find out more, please contact Dr. Monica Siqueiros at msiquei@stanford.edu and/or visit the BRIDGE Lab website: <https://web.stanford.edu/group/bridgelab/>

Opportunity with Dr. Allan Reiss laboratory

Lab Mentor: Dr. Lara Foland-Ross

Project Title: Investigating the influence of genes and hormones on male adolescent neurodevelopment

Project Description:

At the Center for Interdisciplinary Brain Sciences Research (CIBSR), we investigate neurodevelopment in children and teens and strive to understand how changes in behavior and cognitive function are associated with longitudinal alterations in brain function and structure. We are currently conducting a study of adolescent neurodevelopment in males with Klinefelter syndrome – a genetic condition that is characterized by an extra X chromosome (47,XXY). In this longitudinal research project, we use genetics, hormones, MRI, and behavioral assessments to better understand the role of sex chromosomes and gonadal hormones in shaping the brain and executive and socio-emotional function. This project represents a wonderful opportunity for students interested in exploring the influence of genes and/or pubertal hormones on adolescent neurodevelopment and behavior.

Key Words: MRI, puberty, brain, genetics, depression, anxiety, cognition, adolescence

*If this type of research interests you and you would like to participate or just find out more, please contact Dr. Lara Foland-Ross at lfoland@stanford.edu and/or visit the study website: <https://med.stanford.edu/bgapstudy/about.html>.

Opportunity with Dr. Allan Reiss laboratory

Lab Mentor: Dr. Stephanie Van Riper

Project Title: Functional Neuroimaging of the Cognitive Load of Exercise in Attention-Deficit/Hyperactivity Disorder

Project Description:

The Brain Exercise and Fitness (BRExFit) Lab, under the direction of Dr. Allan Reiss, is looking for undergraduates to assist in research related to the neurobiology of cognition in children and adolescents with neurodevelopmental disorders. This work will involve using functional Near-infrared Spectroscopy (fNIRS) to measure brain activity before, during, and after exercise. A variety of experimental techniques are employed and will thus provide students with a diverse experience that spans multiple disciplines including neuroscience, psychology, exercise physiology, and computer science. The overall aim of this research is to develop exercise protocols that may benefit individuals with cognitive dysfunction such as attention deficit/hyperactivity disorder (ADHD) and Autism.

Key words: cognitive function, exercise, neuroimaging, ADHD

*Interested students and/or those who would like to learn more information can contact Dr. Stephanie Van Riper at vanriper@stanford.edu.