The Friedman Brain Institute Announces
2019 FBI Research Scholars

On behalf of the Philanthropic Leadership Council of The Friedman Brain Institute, we are pleased to announce the 2019 recipients of The FBI Research Scholars Awards.

**Fascitelli Research Scholar Award**

Hala Harony-Nicolas, Ph.D., Assistant Professor, Psychiatry

Implication of the hypothalamic oxytocin system in autism-associated social deficits

The proposed study aims to examine the effect of a mutation in the ASD high-risk gene, SHANK3, on the brain oxytocin system, which modulates social behavior. We will test, in rats, how Shank3 mutation affects the function of oxytocin-producing neurons in the brain and the central release of the oxytocin hormone. We will also test whether impaired function of the oxytocin system underlies social behavior deficits, caused by Shank3 mutation.

**Nash Family Research Scholar Award**

James Murrough, MD, Associate Professor, Psychiatry and Neurosciences

Laurel S. Morris, PhD, Post-Doctoral Fellow, Mood and Anxiety Disorders Center

Brain-computer interface (BCI) technology for neurocircuit-based treatment of depression in humans

Major depressive disorder (MDD) is the world’s largest health problem, and current available treatments fail at relieving symptoms for many patients. True precision medicine will require a more individualized approach to treatment, directly targeting core psychopathology. We intend to conduct a non-invasive protocol for direct and individualized brain activity regulation in people with depression using brain-computer interface technology. The use of this brain-computer interface technology will provide a critical next step in directly targeting neural circuit dysfunction in a non-invasive, individualized manner.

**Satter Research Scholar Award**

Sarah Stanley, PhD, Assistant Professor, Medicine, Endocrinology, Diabetes and Bone Disease and Neuroscience

Ultrasound as a novel method for neuromodulation

The proposal aims to optimize and validate a new method for controlling the activity of targeted nerve cells through the use of a novel ultrasound method. In pilot work, we find that ultrasound treatment can be targeted to activate defined cells that are engineered to express a certain type of ion channel and ultrasound-sensitive nanoparticles. Our project aims to build on these findings to optimize the tools in vivo and then apply them to manipulate specific peripheral nerves in vivo, possibly ushering in new treatments for a range of conditions, including diabetes and obesity.

**Mount Sinai Research Award**

Erin L. Rich, MD, PhD, Assistant Professor, Neuroscience

Kanaka Rajan, PhD, Assistant Professor, Neuroscience

Peter H. Rudolph, PhD, Assistant Professor, Neuroscience and Psychiatry

Wireless neural recording of social behavior in freely moving non-human primates

This proposal will combine wireless recording methods with computer vision algorithms to establish an integrated system for studying neural activity in freely and socially behaving monkeys. These approaches will provide a framework for understanding the neural basis of behaviors applied with traditional task-based neurophysiology, such as sleep and social interaction. They could also be used to identify neural mechanisms underlying superordinate behavioral states, such as motivation or mood-like states.

**Joseph and Nancy DiSabato Research Scholar Award**

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Peter H. Rudolph, PhD, Assistant Professor, Neuroscience and Psychiatry

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**Sundaram Research Scholar Award**

Henrietta A. Szotkowski, PhD, Assistant Professor, Psychiatry

Yasmin Hurd, PhD, Assistant Professor, Neuroscience and Psychiatry

Daniel Stein, MD, Assistant Professor, Neuroscience and Psychiatry

The effects of cannabis on the epigenetic state of human sperm with implications for multigenerational inheritance

Our previous studies demonstrated that delta-9-tetrahydrocannabinol (THC) exposure leads to cross-generational alterations in sperm behavior, cranial synapsis, and epigenetic dysregulation in THC-exposed animal sperm. A critical question is whether reprogramming occurs in the human germline that could initiate such transmission. The proposed pilot project will investigate male germline epigenetic mechanisms and stress-related pathways in human cannabinoid users. It has high clinical relevance given the widespread use of marijuana by men of childbearing age.

**Katz / Martin Scholar Award**

Kristen Brember, PhD, Assistant Professor, Neuroscience, Psychiatry and Genetics and Genomic Sciences

Ian Stavemaker, PhD, Assistant Professor, Pharmacological Sciences and Neuroscience

CRISPR activation screens to identify factors for stem cell maturation

Genetic risk factors for psychiatric diseases are greatly enriched for genes expressed during cortical development, and there is a critical need to more comprehensively understand regulators of the developmental process. This project is designed to screen and apply a forward genetic CRISPR-based screening platform to interrogate cell type-specific mechanisms of neural maturation and activity regulation.

**Dyal Research Scholar Award**

Maria de las Mercedes Perez-Rodriguez, MD, PhD, Assistant Professor, Psychiatry

Julie Spitzer, PhD, Assistant Professor, Psychiatry

Daniel Katz, MD, Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

Joshua Hamburger, MD, Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

Jeffrey Zahr, MD, Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

Veerle Bergink, MD, PhD, Assistant Professor, Psychiatry and Obstetrics, Gynecology and Reproductive Sciences

Shanna H. Swan, PhD, Assistant Professor, Environmental Medicine & Public Health

Pance Roussos, MD, PhD, Assistant Professor, Genetics and Genomic Sciences and Psychiatry

Cerebrospinal fluid (CSF) biomarkers of mother-infant social behavior

This study aims to assess cerebrospinal (CSF) fluid oxytocin and vasopressin levels in pregnant woman during labor to elucidate the neurochemical processes underlying maternal caregiving behavior and to find biomarkers that predict mother-infant social behavior. Maternal caregiving behavior is impaired in mice, with postpartum depression or substance use disorders, and in those exposed to psychosocial stress. The results of this study can uncover biomarkers to identify mothers at high risk of impaired caregiving behavior, and discover potential targets for interventions to enhance maternal caregiving behavior.