

# 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

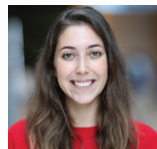
### Implication of the hypothalamic oxytocin system in autism-associated social deficits

The proposed study aims to examine the effect of a mutation in an 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  
Neuroscience



**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



**Cheuk Ying Tang, PhD**  
Associate Professor,  
Radiology, Neuroscience  
and Psychiatry

### 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 vitro 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.

## Sundaram Research Scholar Award



**Wenfei Han, MD, PhD**  
Assistant Professor,  
Neuroscience



**Zhenyu Yue, PhD**  
Professor, Neurology  
and Neuroscience

### The role of the gut-brain axis in the etiology of Parkinson's disease

Our studies will apply novel circuit-mapping technologies to study the role of the vagus nerve in the etiology of sporadic Parkinson's disease. We will determine whether gut-to-brain vagal sensory fibers participate in the transmission of Parkinson's disease-related pathogens from gastrointestinal organs to brain. These studies will also allow us to test the idea of gastrointestinal vagal denervation as potential early intervention of Parkinson's disease.

## Mount Sinai Research Scholar Award



**Daniel Wacker, PhD**  
Assistant Professor,  
Pharmacological Sciences  
and Neuroscience



**Marta Filizola, PhD**  
Sharon & Frederick A. Klingenstein-  
Nathan G. Kase, MD Professor,  
Pharmacological Sciences  
and Neuroscience

### Empowering structure-based discovery of new medicines to combat the opioid epidemic

Developing safer medications to treat opioid addiction or severe pain without life-threatening side effects has been severely obstructed by a poor mechanistic understanding of how clinically used analgesics bind to and activate the  $\mu$ -opioid receptor (MOR). The Wacker and Filizola labs aim at elucidating the molecular details of how the clinically used opioids fentanyl and methadone interact with MOR, using a novel combination of X-ray crystallography and machine learning predictions.

## Joseph and Nancy DiSabato Research Scholar Award



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



**Kanaka Rajan, PhD**  
Assistant Professor,  
Neuroscience



**Peter H. Rudebeck, 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 rarely studied 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.

## Richard and Susan Friedman Research Scholar Award



**Henrietta A. Szutorisz, PhD**  
Assistant Professor,  
Psychiatry



**Yasmin Hurd, PhD**  
Professor, Neuroscience  
and Psychiatry



**Daniel Stein, MD**  
Chief, Division of Reproductive  
Endocrinology

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

Our previous studies demonstrated that delta9-tetrahydrocannabinol (THC) exposure leads to cross-generational alterations in reward behaviors, striatal synaptic plasticity 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 cannabis users. It has high clinical relevance given the widespread use of marijuana by men of childbearing age.

## Katz / Martin Scholar Award



**Kristen Brennand, PhD**  
Associate Professor,  
Neuroscience, Psychiatry  
and Genetics and  
Genomic Sciences



**Ian Slaymaker, PhD**  
Assistant Professor,  
Neuroscience and  
Pharmacological Sciences

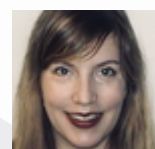
### CRISPR activation screens to identify factors for stem cell maturation

Genetic risk factors for psychiatric disease 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 engineer and apply a forward-genetic CRISPR-based screening platform to interrogate cell type specific mechanisms of neuronal maturation and activity regulation.

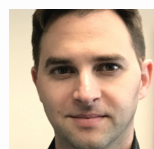
## Dyal Research Scholar Award



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



**Julie Spicer, PhD**  
Assistant Professor,  
Psychiatry



**Daniel Katz, MD**  
Assistant Professor,  
Anesthesiology,  
Perioperative &  
Pain Medicine



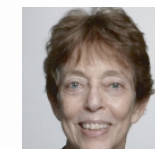
**Joshua Hamburger, MD**  
Assistant Professor,  
Anesthesiology,  
Perioperative &  
Pain Medicine



**Jeffrey Zahn, MD**  
Assistant Professor,  
Anesthesiology,  
Perioperative &  
Pain Medicine



**Veerle Bergink, MD, PhD**  
Professor Psychiatry  
and Obstetrics,  
Gynecology and  
Reproductive Science



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



**Panos Roussos, MD, PhD**  
Associate 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 women 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 mothers 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.