Icahn School of Medicine at Mount Sinai

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-machine interface with ultra-high field MRI for neurocircuit-based treatment of depression in humans

The ventral tegmental area (VTA) is a major source of dopamine in the brain and its activity mediates reward-learning, motivation, volition and affective tone– all faculties that are disturbed in major depressive disorder (MDD). We intend to conduct the first non-invasive protocol for direct and individualized VTA activity self-regulation in humans with MDD using brain-machine-interface technology with ultra-high field 7-Tesla MRI. We expect that successful VTA self-regulation will lead to improved symptoms in MDD.

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 μ-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 reprograming 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

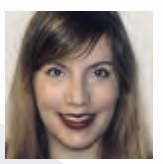
Ian Slaymaker, PhD
Assistant Professor, Neuroscience and Pharmacological Sciences

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



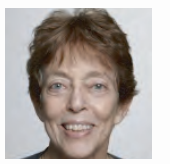
Julie Spicer, PhD
Assistant Professor, Psychiatry

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.