The Friedman Brain Institute

15th Anniversary Celebration

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Innovation and Translation in Brain Sciences

Highlighting the Next Generation of Leaders in Neuroscience



Icahn School The Friedman of Medicine at Brain Institute Mount Sinai

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The Friedman Brain Institute

For the past 15 years—through the unprecedented growth that put the Institute on par with the very best, long-established institutions in the field—it has been very rewarding for me to know that our research is being translated into therapies that benefit our patients. Over the years, we have recruited some of the most innovative researchers to Mount Sinai, and today, they have the imagination and skills to make the groundbreaking discoveries that will have a lasting impact on human health.

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Richard A. Friedman

Co-Chairman, Boards of Trustees, Mount Sinai Health System

Image by Mustafa M. Siddiq, PhD

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THE FRIEDMAN BRAIN INSTITUTE

Fifteen Years of Excellence at The Friedman Brain Institute

The challenge has always been monumental, and perhaps this is the most formidable frontier in science: How to unlock the secrets of the brain's countless neural pathways to understand brain function and dysfunction, to improve the diagnostic tools of neuroscience, and to discover more effective therapies and eventually cures for brain disorders.

The brain is the body's most complex organ by a very wide margin, its circuitry consisting of about 100 billion neurons, another 100 billion non-neuronal glial cells, and perhaps 100 trillion synaptic connections among these neurons that have the capacity to continually strengthen or weaken specific neural pathways in response to life's experiences. Developing effective therapeutics requires that we improve our understanding of brain function at the molecular, cellular, and systems levels.

The Icahn School of Medicine at Mount Sinai, for decades a leader in neuroscience research, has been fortified over the past 15 years by a thriving and still growing Friedman Brain Institute. With considerable investment in talent, our many hundreds of scientific explorers, clinicians, and trainees have made extraordinary contributions to scientific knowledge and to the development of several new approaches and technologies. And today, we have spectacular new tools—artificial intelligence, genomics, advanced imaging, and computational biology—that are being integrated into our neuroscience research.

Our vast research and clinical capabilities place us at the center of today's exciting neuroscience inflection point. We are more optimistic than ever that the growing arsenal of new tools to study the bidirectional relationships across molecules, cells, and circuits, and the dedication of scientists and clinicians like ours, will lead to major advances in understanding and treating brain disorders in the next decade and, just as important, training tomorrow's leaders in this most important of endeavors. Nothing would have a greater positive impact on humanity than conquering these illnesses.

> Eric J. Nestler, MD, PhD Paul J. Kenny, PhD

The Friedman Brain Institute Leadership Team

Eric J. Nestler, MD, PhD Director, Friedman Brain Institute

Schahram Akbarian, MD, PhD Chief, Division of Psychiatric Epigenomics

Priti Balchandani, PhD Director, Advanced Neuroimaging Research Program

Joshua B. Bederson, MD Chair, Department of Neurosurgery

Joseph Buxbaum, MSc, PhD Director, Seaver Autism Center

John F. Crary, MD, PhD Neuropathology Brain Bank and Research CoRE

Kristen Dams-O'Connor, PhD Director, Brain Injury Research Center

Samuel Gandy, MD, PhD Director, Center for Cognitive Health

Alison M. Goate, D. Phil Director, The Ronald M. Loeb Center for Alzheimer's Disease

Patrick R. Hof, MD Dorothy and Irving Regenstreif Professor

George W. Huntley, PhD Director, Neuroscience PhD Graduate Training Area Yasmin Hurd, PhD Director, Addiction Institute at Mount Sinai

René Kahn, MD, PhD Chair, Department of Psychiatry

Paul Kenny, PhD Chair, Nash Family Department of Neuroscience Director, Drug Discovery Institute

Helen S. Mayberg, MD Director, Center for Advanced Circuit Therapeutics

lan S. Maze, PhD Director, Center for Neural Epigenome Engineering

Scott J. Russo, PhD Director, Center for Affective Neuroscience and Brain Body Research Center

Anne Schaefer, MD, PhD Professor, Nash Family Department of Neuroscience

Paul Slesinger, PhD Vice-Chair, Nash Family Department of Neuroscience Director, Center for Neurotechnology and Behavior

Nadejda Tsankova, MD, PhD Director, Neuropathology

Barbara G. Vickrey, MD, MPH Chair, Department of Neurology

Nan Yang, PhD Director, Alper Center for Neural Development and Regeneration

The Friedman Brain Institute Agenda

8:30 am | Arrival and Registration

9:00 am | Opening Remarks

Dennis S. Charney, MD Dean, Icahn School of Medicine at Mount Sinai

9:10 am | Welcome and Introduction

Eric J. Nestler, MD, PhD Director, Friedman Brain Institute

9:30 am | Planary Speaker

Denise Cai, PhD "Memory stability and flexibility across the lifetime" Introduced by Schahram Akbarian, MD, PhD

10:10 am | Break

10:25am | Panel: The Human Brain Laboratory

Priti Balchandani, PhD, Alex Charney, MD, PhD, Xiaosi Gu, PhD, Ignacio Saez, PhD, Daniela Schiller, PhD

Moderated by Yasmin Hurd, PhD and Helen Mayberg, MD

The Friedman Brain Institute Agenda

11:15 am | Planary Speaker

Towfique Raj, PhD

"Using Integrative Functional Genomics to Decode the Mechanisms of Neurodegeneration"

Introduced by Panos Roussos, MD, MS, PhD

11:55 am | Lunch

1:10 pm | Panel: The Future of Neuroscience

Silvia DeRubeis, PhD, Fanny Elahi, MD, PhD, Nadejda Tsankova, MD, PhD, Hiro Morishita, MD, PhD

Moderated by Alison Goate, DPhil

2:00 pm | Planary Speaker

Nan Yang, PhD "Neuronal Autophagy and Schizophrenia: Explorations through Human Stem Cell-Derived Models"

Introduced by Sarah Millar, PhD

2:40 pm | Panel: The Future of Neurotherapeutics

Yizhou Dong, PhD, Daniel Wacker, PhD, James Murrough, MD, PhD, Anne Schaefer, MD, PhD

Moderated by Paul Slesinger, PhD and Rachel Yehuda, PhD

The Friedman Brain Institute Agenda *continued*

3:30 pm | Break

3:45 pm | Planary Speaker

Erin L. Rich, MD, PhD "Neural circuits and mechanisms for social cognition" Introduced by Peter Rudebeck, PhD

4:25 pm | Panel: The Future of Neuroscience - Students & Postdocs

Arianna Davis (Gu Lab) | MD/PhD Student Michael B. Fernando (Slesinger Lab) | PhD Student Joe Zaki (Cai Lab) | PhD Student Miguel Rodriguez de los Santos (Breen Lab) | Postdoctoral Fellow Jennifer Chan (Maze Lab) | Postdoctoral Fellow Carmen Romero-Molina (Goate Lab) | Postdoctoral Fellow Moderated by Ian Maze and George Huntley

5:15 pm | Closing Remarks

Paul Kenny, PhD Chair, Nash Family Department of Neuroscience

5:45 pm | Adjourn for Reception



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Since its creation in 2008, the Friedman Brain Institute has developed into a remarkable, and powerful, academic umbrella that fosters research collaborations across the Mount Sinai neuroscience communities. For a team of neuroscientists conducting large-scale, multidisciplinary research on the comprehensive cytoarchitecture and connectomics of the human and non-human primate brain in the context of agerelated vulnerability and neurodegenerative disorders, the Friedman Brain Institute provides an essential infrastructure to promote access to technologies not usually available at the level of a single laboratory, in our case particularly in multiomics, brain imaging and in novel artificial intelligence-based analytical approaches. It has been the key conduit to establish a strong network of synergistic collaborations supported by the outstanding scientific and clinical expertise of our many colleagues within the institution and globally.

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Patrick R. Hof, MD

Professor Neuroscience, Ophthalmology and Geriatrics and Palliative Medicine Director Glickenhaus Center for Successful Aging and the Kastor Neurobiology of Aging Laboratories

The Friedman Brain Institute Centers

Advanced Neuroimaging Research Program Director: Priti Balchandani, PhD

Alper Center for Neural Development and Regeneration Director: Nan Yang, PhD

Alzheimer's Disease Research Center (NIA-funded Center) Director: Mary Sano, PhD

Bonnie and Tom Strauss Movement Disorders Center Director: Susan Bressman, MD and Brian Kopell, MD

Brain and Body Research Center Director: Scott J. Russo, PhD

Brain Injury Research Center of Mount Sinai Director: Kristen Dams-O'Connor, PhD

Center for Affective Neuroscience Director: Scott J. Russo, PhD

Center for Computational Neuroscience Interim Director: Helen S. Mayberg, MD

Center for Computational Psychiatry Director: Xiaosi Gu, PhD

Center for Disease Neurogenomics Director: Panos Roussos, MD, PhD, MS

Center for Engineering and Precision Medicine Director: Priti Balchandani, PhD and Jonathan S. Dordick, PhD

Center for Glial Biology of Mount Sinai/CUNY Director: Anne Schaefer, MD, PhD and Patrizia Casaccia, MD, PhD Center for Molecular Integrative Neuroresilience Director: Giulio M. Pasinetti, MD, PhD

Center for Neural Epigenome Engineering Director: Ian S. Maze, PhD

Center for Neurotechnology and Behavior Director: Paul Slesinger, PhD

Center for Parkinson's Disease Neurobiology Director: Zhenyu Yue, PhD

The Center for Psychedelic Psychotherapy and Trauma Research Director: Rachel Yehuda, PhD

Center for Recovery from Complex Chronic Illness Director: David Putrino, PhD

Collaborative Study of the Genetics of Alcoholism (COGA) (NIAAA-funded Center) Director: Alison M. Goate, DPhil

Depression and Anxiety Center for Discovery and Treatment (DAC) Director: James Murrough, MD

Glickenhaus Center for Successful Aging Director: Patrick R. Hof, MD

Jeff and Lisa Blau Adolescent Consultation Center for Resilience and Treatment Director: Alexander Charney, MD, PhD

Light and Health Research Center Director: Mariana Figueiro, PhD

The Friedman Brain Institute Centers

Mark Lebwohl Center for Neuroinflammation and Sensation Director: Brian S. Kim, MD

Transcriptional Mechanisms of Drug Addiction (NIDA Program Project Grant) Director: Eric J. Nestler, MD, PhD

Mount Sinai Center for Transformative Disease Modeling Director: Bin Zhang, PhD

Mount Sinai Epilepsy Program Director: Madeline Fields, MD and Lara Marcuse, MD

Nash Family Center for Advanced Circuit Therapeutics Director: Helen S. Mayberg, MD

Neuropsychoimaging of Addiction and Related Conditions Research Program (NARC) Director: Rita Z. Goldstein, PhD

Neurosurgery Simulation Core Director: Joshua B. Bederson, MD

Sinai BioDesign Director: Benjamin Rapoport, MD, PhD

The Lipschultz Center for Cognitive Neuroscience Director: Erin L. Rich, MD, PhD and Peter H. Rudebeck, PhD

The Ronald M. Loeb Center for Alzheimer's Disease Director: Alison M. Goate, DPhil

The Seaver Autism Center for Research and Treatment Director: Joseph D. Buxbaum, PhD

The Friedman Brain Institute Training Tomorrow's Leaders

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"Neuroscience research training in the 21st century requires hands-on experience with collaborative, multi-team and multidisciplinary approaches. The FBI is a model training environment that integrates high-impact science, collaborative investigators and diverse experimental questions, model systems and translational applications, ensuring our trainees today are the scientific leaders of tomorrow"

> George W. Huntley, PhD Director Neuroscience PhD Graduate Training Area Profesor Nash Family Department of Neuroscience

The Friedman Brain Institute Training Tomorrow's Leaders

Postdoctoral fellows are the lifeblood of biomedical research. The neuroscience community at Mount Sinai is very proud of the outstanding postdoctoral researchers who as part of their advanced training help drive our basic, translational, and clinical research into better understanding the brain and nervous system and treating neurological and psychiatric disorders. Our postdoctoral fellows, who represent the broadest range of cutting-edge experimental approaches and diverse personal backgrounds, benefit from robust scientific support and comprise a close and collaborative community of scholars.

Neuroscience Postdoctoral Association

The Neuroscience Postdoctoral Association was founded in 2019 with the goal of enhancing the personal and professional experiences of postdoctoral fellows in the Friedman Brain Institute at the Icahn School of Medicine at Mount Sinai. The Association host a variety of events ranging from social events to professional development discussions and welcome the participation of all Neuroscience postdocs.

Neuroscience Mentorship Distinction Award (NMDA)

2023 | Silvia De Rubeis, PhD 2022 | Hala Harony-Nicolas, PhD 2021 | Deanna Benson, PhD 2020 | Mark Baxter, PhD 2019 | Kristen Brennand, PhD 2018 | George W. Huntley, PhD 2017 | Scott J. Russo, PhD

Robin Chemers Neustein Postdoctoral Fellowship Award

2022 | Jennifer Chan, PhD 2021 | Angélica Torres-Berrío, PhD 2020 | Kirstie A. Cummings, PhD 2019 | Pinar Ayata, PhD 2018 | Lorna Farrelly, PhD 2017 | Catherine Jensen Peña, PhD 2015 | Elizabeth Heller, PhD 2014 | Allyson Friedman, PhD

Doft Family Postdoc Innovator Award

2023 | Mate Kiss, PhD and Antonio Aubry, PhD 2022 | Adele Mossa, PhD and Angélica Torres Berrío, PhD

Exceptional Achievement Postdoc Award

2023 | Anthony Lacagnina, PhD 2022 | Zac Pennington, PhD 2021 | Shea Andrews, PhD and Yulin Zhao, PhD

Exemplary Citizenship Award

2023 | Denise Cai, PhD and Peter Rudebeck, PhD 2022 | Zac Pennington, PhD

DiverseBrains Award

2023 | Jacqueline Beltran and Trevonn Gyles 2022 | Aya Osman, PhD and Ashley Cunningham

The Friedman Brain Institute Training Tomorrow's Leaders

Philip Hausfeld Memorial Scholarship Award

2023 | Arthur Godino 2022 | Katherine Meckel 2021 | Nick Upright 2020 | Lucy Bicks 2019 | Carla Golden 2018 | Ashley Lepack 2017 | Josefa Sullivan 2016 | Bridget Matikainen 2015 | Hannah Cates 2014 | Sam Golden 2013 | Jessica Walsh 2011 | Eric Bloss

"BRAIN" Award (Best Record of Achievement in Neuroscience)

2023 | Austin Baggetta 2022 | Sarah Banker 2021 | Alexandra Munch 2020 | Lauren Vetere 2019 | Michael Leventhal 2018 | Denise Croote, Sasha Fulton and Katherine Leclair 2017 | Kavya Devarakonda 2016 | Lucy Bicks 2015 | Meghan Flanigan

PhD in Neuroscience **BY THE NUMBERS**

Neuroscience at the Icahn School of Medicine at Mount Sinai



in Research Dollars Per Pl among U.S. medical schools, AAMC

Per Neuroscience PhD Student Average #1st author publications Average # of publications







Pl's

 Phipop

 in Neuroscience

 80
 Students enrolled

 90%
 Students continue on to do postdocs

 12
 Students supported by individual fellowships

 12
 Students supported by NH training grants

130 PIs in the Neuroscience Training Program 45 PIs in the NeuroscienceDepartment

The Friedman Brain Institute Diversity in Neuroscience

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Compared with two decades ago, women are now better represented among medical and graduate students, postdocs, and assistant professors. However, despite gains, we still have a smaller than desired number of senior women faculty and far fewer faculty from under-represented minority groups-at Mount Sinai and nationwide. Recent studies continue to document implicit biases in the scientific workplace, and concerns remain around quality of life issues and obstacles to faculty retention and promotion that affect everyone. At the Friedman Brain Institute, we are driving an ongoing discussion - now in its tenth year designed to formulate positive steps through which we can make progress in these areas. We cannot solve societal issues, but perhaps we can serve as a smaller focus group and demonstrate the kinds of tangible actions that lead to real improvements.

Eric J. Nestler, MD, PhD

Nash Family Professor of Neuroscience Director, The Friedman Brain Institute Dean for Academic Affairs Icahn School of Medicine at Mount Sinai Chief Scientific Officer Mount Sinai Health System

Mission Statement

Our goal is to support highly innovative and productive research in basic, translational, and clinical neuroscience by promoting an exciting, equitable, diverse and inclusive environment that empowers all members of our community to contribute to scientific discovery and clinical translation. Our goal is to generate an environment that fosters creative approaches to fully understand brain and nervous system function and develop therapies and cures for disease and eventually preventive measures. We commit to listening to and learning from the many diverse voices of our community in order to remove barriers to opportunities and success for everyone.

The Friedman Brain Institute

The Friedman Brain Institute Outreach

Mentoring in Neuroscience Discovery (MiNDS)

Determined to bring engaging and accessible neuroscience education to East Harlem public schools, Lauren Friedman and fellow graduate students launched SNOP, the Sinai Neuroscience Outreach Program in 2011. In its initial stages, the program focused on planning classroom lessons, running family science nights, and hosting the annual Brain Awareness Week Fair. In 2015, SNOP re-branded itself as MiNDS (Mentoring in Neuroscience Discovery) and continued to expand its influence citywide. The program, now directed by Denise Croote, PhD, Instructor in the Department of Neuroscience, hosts a series of public lectures, sheep brain dissections, laboratory tours, brain fairs, and classroom courses. MiNDS has expanded its reach to multiple NYC public schools and has participated in several city-wide programs, including the Intrepid's Goals for Girls Fair, the Team Cindy 5K, and the World Science Festival's City of Science Fairs as well as assisted with the Art of the Brain exhibit and Storytelling show.

Center for Excellence in Youth Education (CEYE)

Since 1975, the Center for Excellence in Youth Education (CEYE) has made a difference in the lives of thousands of students from New York City schools, thanks in part to the creative contributions of our faculty, staff, students, and postdoctoral trainees. Through a wide range of education pipeline programming, we open doors for students from underrepresented groups and economically disadvantaged homes. In so doing, they are changing the face of science, medicine, and other health care professions.

Storytelling

Stories surround us. Everyone has a story to tell, whether it's about how we came to be the way we are, a challenge, a triumph... or even a catastrophe. The power of storytelling is that it makes what we have to say relatable and gives us the ability to appeal to the values of others. As scientists, we can use storytelling to communicate our passion for science, our drive, our successes and failures – to our friends and families, potential donors, study sections, and the public.

2023 Stories of Brain and Beyond

A special Mount Sinai storytelling event in which five scientists shared true, personal stories of their scientific paths. Created through a collaboration between The Friedman Brain Institute and The Story Collider, and spearheaded by neuroscience postdoctoral fellow Aya Osman, PhD, Instructor in the department of Pharmacological Sciences, and Abha K Rajbhandari, PhD, Assistant Professor of Psychiatry, and Neuroscience, this event was performed live, on-stage, at Caveat, a New York City performance space. From the tragic to the hilarious, the storytellers explored the deeply human side of science.

The Friedman Brain Institute Emerging Scholars

Mount Sinai Emerging Scholars Program

Spearheaded in 2023 by Instructor's Aya Osman, PhD and Zachary Pennington, PhD, the Friedman Brain Institute and the Nash Family Department of Neuroscience sponsor a scholarship opportunity for advanced graduate students, from underrepresented backgrounds, who are looking to pursue postdoctoral work in the field of neuroscience. Up to two selected recipients are invited to give a talk, in-person, at Mount Sinai, network with faculty, and receive a \$1000 honorarium (in addition to travel expenses). The Emerging Scholars Program has been a huge success with four awardees to date.

2023 Awardees

Kay Nisbett NIH/National Institute on Drug Abuse, and George Koob Lab

Najah Walton Tufts University, Jamie Maguire Lab

2022 Awardees

Brianna George Wake Forest University School of Medicine, Sara Jones Lab

Lilyana Quigley University of Texas Southwestern Medical Center at Dallas, Lenora Volk Lab

Image by Ni-ka Ford

The Friedman Brain Institute Art of the Brain

Art transports us, engages us, provokes thought, summons deep emotions, mirrors experience, and, most often, is simply beautiful.

Whether viewing art or creating art, the relationship between art and the brain is undeniable.

Inspired by neuroscience research at the Friedman Brain Institute, the Art of the Brain exhibition, created and curated by Veronica Szarejko, is a collection of photographs, illustrations and sculptures that celebrate the beauty of the brain as seen through the eyes of some of the world's leading researchers and medical illustrators. With the aid of the latest technological advances, scientists are better able to understand how the brain works and to accelerate the development of new treatments for many brain disorders. Whether an "accidental" element or an intended consequence, the byproduct of this research, the pieces that make up the Art of the Brain exhibition, offer an "explosion of vibrant colour and intricate detail, evoking chaos and calm, beauty and pain..." An experience that "is about being human; the remarkable microscopic activity that makes us living, feeling beings—cognition, emotion, sensation, perception."

Born from the Art of the Brain exhibition, the Art of the Brain Lecture series features an exciting array of experts from within the science and art communities who explore the intersection of art and neuroscience and the variety of ways in which this convergence impacts people on both a neurological level and the level of human experience.

Image by Yuko Hara, PhD

The Friedman Brain Institute Philanthropy

FBI Philanthropic Leadership Council

Rich Friedman

Joshua Nash

Marc Lipschultz

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Jane Martin

Hirschell Levine

Adam Shaprio

Jane Zenker

Leslie Rubin

Andy Alper

Anton Levy

Lisa Blau

Jacob Doft

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In almost no time, the Department of Neuroscience has been ranked among the top four National Institutes of Health-funded departments in the nation, publishing extraordinary research and developing new therapies for some of the world's most debilitating diseases. This speaks to the promise of their work and a collaborative commitment to expand our understanding of the complexities of the brain. This gives me great confidence they will be leaders in the next exciting wave of discoveries.



Joshua Nash

Trustee, whose generosity over the years led to the creation of the Nash Family Department of Neuroscience