Department of Psychiatry

2022 Chair’s Report
Mount Sinai’s Department of Psychiatry is one of the most productive in the nation. We are ranked No. 7 in National Institutes of Health (NIH) funding for psychiatry, and in 2021 we published more than 850 papers, completed more than 800,000 outpatient visits, and received $49 million in active grants. We have over 300 faculty, with seven highly cited researchers, and seven who are members of the National Academy of Medicine.

We also launched three new centers last year that represent the future of psychiatry.

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We also launched three new centers last year. Collectively, these new programs represent the future of psychiatry and demonstrate Mount Sinai’s commitment to innovating to meet the needs of our patients.

The Center for Psychedelic Psychotherapy and Trauma Research studies unconventional treatment methods such as MDMA-assisted psychotherapy for post-traumatic stress disorder (PTSD), depression, and anxiety in veterans and civilians. The U.S. Food and Drug Administration designated this therapy as a breakthrough treatment for PTSD in 2017, and trials are underway to learn more about this promising option. We plan to expand our research to study other psychedelic-assisted psychotherapies using compounds such as psilocybin. Using computational genetics, molecular biology, and neuroimaging, we hope to accelerate the understanding of how, when, and for whom these treatments work.

In another future-looking endeavor, we established the Center for Computational Psychiatry. The center is one of the world’s first integrated programs to study how quantitative tools and methodologies can improve the diagnosis and treatment of mental health issues, such as addiction, eating disorders, autism, and personality disorders. Since its inception a decade ago, computational psychiatry has become one of the fastest growing and most exciting areas in neuropsychiatry. Our new center will leverage rich clinical resources and computational expertise across departments to link brain mechanisms to behavior and develop life-changing treatments for those with psychiatric disorders.

Most recently, we launched the Jeff and Lisa Blau Adolescent Consultation Center for Resilience and Treatment. This novel clinical research center will focus on schizophrenia, a devastating mental illness that typically emerges before or during adolescence. The center will serve as a clinical and research platform to increase our understanding of schizophrenia, improve treatments for patients with the illness, and develop new interventions for those at increased risk. We envision the center providing a paradigm shift for the field, combining state-of-the-art clinical care with groundbreaking research using the latest tools in clinical data science, artificial intelligence, and genomics.

It has been a busy year for our department, and we are proud of our achievements. To learn more about our research and clinical programs, please visit icahn.mssm.edu/psychiatry.
An estimated three-quarters of all psychiatric disorders debut prior to or during adolescence. To address this, in October 2021, Mount Sinai established the Jeff and Lisa Blau Adolescent Consultation Center for Resilience and Treatment. The Center will initially focus on schizophrenia, a devastating mental illness that affects 1 percent of the population and has been resistant to breakthroughs in diagnosis, treatment, and prevention.

“Psychiatric disorders are illnesses of the young, and the Blau Center addresses the window of vulnerability that exists in the second decade of life through a strong clinical and research platform,” says René S. Kahn, MD, PhD, Esther and Joseph Klingenstein Professor and Chair, Department of Psychiatry and Behavioral Health System, who will serve as inaugural Director of the Center. “We’re grateful to Jeff and Lisa Blau for recognizing the gravity of the problem and for providing generous funding that will increase our understanding of psychiatric disorders and set the stage for innovative new treatments for patients with these lifelong conditions.”

The Blau Center will combine clinical work and scientific research to ensure patients have the most comprehensive care and that researchers have the most advanced tools in clinical data science, artificial intelligence, neuroimaging, and genomics.

“We’re committed to accelerating novel therapeutic development by leveraging the considerable knowledge of genetics we’ve gained over the past 15 years,” says Alexander Charney, MD, PhD, Assistant Professor of Psychiatry, Genetics and Genomic Sciences, Neuroscience, and Neurosurgery, and Executive Director of the Blau Center. “And most importantly, we won’t be afraid to take some risks.”

Dr. Kahn, an internationally known expert on the neurobiology of schizophrenia, echoes that perspective. “We’re using the same drugs with the same mechanisms of action that were developed in the 1950s, and therefore we need innovative new therapeutics. We believe the Blau Center can set itself apart by pushing the boundaries of discovery in ways no other institution has yet done.”

Over the past decade, Dr. Charney’s lab has used genomic data to dissect the clinical features of schizophrenia and bipolar disorder. He is a strong advocate of using this method to develop experimental therapeutics for early phase clinical trials. In fact, clinical trials will be pivotal to the work of the Blau Adolescent Consultation Center. Scientists there will initiate and participate in large, multisite studies examining and validating treatment interventions in psychosis and schizophrenia. “We have two or three genes that we believe are very promising, and our goal is to implement a first-in-human therapeutic for several mental illnesses,” says Dr. Charney.

Researchers at the Center will launch comparative studies of drugs on the market to determine and provide valuable guidance around those that work and those that do not and what can be done to improve them for adolescents and young adults. In addition, machine learning experts will mine hospital health records of young patients spanning many years to inform treatment protocols.

Another novel approach will be physically moving the Blau Center’s research into the clinic. Social workers, for example, will partner with research teams, and research coordinators will communicate regularly with all of the Center’s physicians, including residents. “At an academic center such as Mount Sinai, clinical practice and research need to be one and the same,” Dr. Charney says. “This is a huge programming goal of ours, which we believe will help to change the culture of how we work and, ultimately, the treatment and progression of psychiatric illness.”

Illustration by Jessica Johnson (www.jessicajohnsonart.com).
Combining Clinical and Computational Research Provides an Unprecedented View of the Brain

The unique pairing of two highly specialized research centers of excellence at the Icahn School of Medicine at Mount Sinai has generated some of the nation’s most integrative applied research into the brain for treating complex neuropsychiatric disorders. By leveraging the Center for Computational Psychiatry with the deep brain stimulation (DBS) scientific expertise of the Nash Family Center for Advanced Circuit Therapeutics (C-ACT), Mount Sinai is producing a growing body of transdisciplinary research, including innovative new studies about the use of DBS for obsessive-compulsive disorder (OCD) and treatment resistant depression (TRD).

“The synergy of research and clinical care catalyzed by the co-localization of clinicians and neuroscientists at C-ACT is enabling us to systematically interrogate the various brain circuits that underlie severe psychiatric illnesses during DBS treatment,” says Helen Mayberg, MD, Founding Director of C-ACT, and Professor of Neurology, Neurosurgery, Psychiatry, and Neuroscience at the Icahn School of Medicine at Mount Sinai. “We have organized our human research questions around ongoing surgical neuromodulation treatments, drawing on a wide range of experts, including those in psychiatry, neurology, neurosurgery, radiology, engineering, and neuroscience.” This effort would not have been possible without the dedication and support from the Department of Neurosurgery and the clinical Center for Neuromodulation at Mount Sinai West.

A critical partner for new discoveries in this growing field is the Center for Computational Psychiatry—one of the first integrated centers in the world to study how algorithms and big data can improve mental health diagnosis and treatment. “Dr. Mayberg’s team brings human DBS and clinical psychiatric experience to the table, while our group brings basic neuroscience and computational experience,” says Xiaosi Gu, PhD, Director of the Center, and Associate Professor of Psychiatry, and Neuroscience. “It’s a truly balanced partnership.”

The area of OCD is emblematic of their joint success. Dr. Mayberg says, “C-ACT’s ongoing imaging and electrophysiological studies in the surgical OCD treatment studies at Mount Sinai West have made important advances in recent years, but new computational approaches will take this work to the next level. Dr. Gu’s group was able to provide that advantage, which in turn helped us secure a major new grant, with opportunities for many additional projects across other disorders treated with DBS.”

Dr. Gu and Vincenzo Fiore, PhD, Assistant Professor of Psychiatry, have also joined forces with the OCD research group at C-ACT on a new National Institute of Mental Health grant led by co-principal investigators Martijn Figee, MD, PhD, Associate Professor of Psychiatry and Neurosurgery; and Ki Sueng Choi, PhD, Assistant Professor of Neurosurgery, Diagnostic, Molecular, and Interventional Radiology. Other key investigators on the project include Allison C. Waters, PhD, Assistant Professor of Psychiatry, and Neuroscience; and Brian Kopell, MD, Professor of Neurosurgery, Neurology, Psychiatry, and Neuroscience.

The team has refined the surgical approach to a well-established clinical DBS target for OCD, a complex white matter fiber bundle called the anterior limb of the internal capsule (ALIC), with encouraging new results. Their challenge, however, has been to better define the specific pathways that travel through the ALIC that mediate specific symptom changes and optimal clinical outcomes in OCD patients treated with DBS.

Dr. Gu’s and Dr. Fiore’s computational expertise adds an important quantitative behavioral readout of these pathways’ specific stimulation effects, building on imaging studies by Drs. Choi, Figee, and Kopell, and electrophysiological signatures defined by Dr. Waters. Together, the team will construct a comprehensive network blueprint, or “atlas,” for OCD using the association of white matter structural connections, electrocortical responses, and behavioral outcomes to refine DBS surgery and guide DBS treatment delivery in order to maximize clinical outcomes for patients.

This innovative, transdisciplinary research approach, now being tested in treatment-resistant OCD and depression (two of the most challenging psychiatric disorders), has already provided important new scientific insights with direct impact on DBS treatment and patient outcomes. As this collaboration continues to grow and mature, the opportunities for development of additional neuroscience-informed circuit therapeutic treatment options for other severe psychiatric disorders will lead to profound implications for the future of patient care.
Vital Discoveries in the Use of Ketamine for PTSD

Adriana Feder, MD
Associate Director for Research, World Trade Center Mental Health Program
Associate Professor, Psychiatry

Mount Sinai continues to gain global recognition for its groundbreaking research into the use of ketamine for PTSD. For the first time in a randomized controlled trial, research published in The American Journal of Psychiatry has demonstrated the effectiveness of repeated ketamine infusions for treating PTSD, and how changes in the brain's neurocircuitry may be at the root of that improvement. That seminal work has paved the way for additional research to determine if the robust response seen in patients with chronic PTSD can be maintained over longer periods, such as months or even years.

"Two-thirds of participants in the ketamine group showed significant clinical improvement, and some of them had an amazing response," says Adriana Feder, MD, Associate Professor of Psychiatry, and first author and principal investigator of the study, which was conducted at the Depression and Anxiety Center for Discovery and Treatment at Mount Sinai. "We observed a rapid improvement in PTSD symptoms, including a reduction in the intensity and number of memory intrusions and nightmares, decreased avoidance of trauma reminders, and increased ability to enjoy activities and feel closer to others."

The clinical trial included 30 participants with chronic and severe PTSD. Participants had experienced their disorder for an average of 15 years, with almost half reporting sexual assault or molestation as their primary trauma. Half of the trial participants were randomly assigned to receive six infusions of intravenous ketamine over two consecutive weeks and the other half received six infusions of the psychoactive placebo control midazolam over the same period of time. Researchers observed significantly higher improvement in PTSD symptoms in the ketamine group compared to the midazolam group, an improvement that was maintained for an average of four weeks following the course of six infusions. Participants in the ketamine group reported feeling less panicked, greater peace, and an enhanced ability to handle negative thoughts.

While ketamine has been used as an anesthetic for more than 50 years, it was not until 2014 that its potential efficacy for PTSD was identified in a study led by Dennis S. Charney, MD, Anne and Joel Ehrenkranz Dean, Icahn School of Medicine at Mount Sinai and President for Academic Affairs, Mount Sinai Health System. "The data presented in our current study replicates and builds upon our initial findings about ketamine for PTSD and indicates that in addition to being rapid, ketamine's effect can be maintained over several weeks," Dr. Charney says.

An estimated 6 percent of the U.S. population is affected by PTSD, but only two medications have been approved by the U.S Food and Drug Administration to treat the disorder, sertraline and paroxetine, both selective serotonin reuptake inhibitors. Moreover, at least one-third of people with the disorder do not respond to these medications. For those who do respond — even partially — improvement in symptoms can take weeks or months.

Little is known about the mechanisms underlying response to ketamine in patients with PTSD, but a neuroimaging study conducted by Dr. Feder’s team in a subset of participants who completed her repeated ketamine trial sheds light, for the first time, on ketamine-related changes in neurocircuitry functioning associated with PTSD symptom improvement.

Preliminary findings, published in Neuropsychopharmacology from analyses conducted by first author Agnes Norbury, PhD, at the time a postdoctoral fellow at Mount Sinai working with Dr. Feder, revealed that ketamine-related PTSD symptom improvement was associated with increased inhibition of the amygdala (the part of the brain's limbic system involved in the initial processing of emotions, including fear) by the ventromedial prefrontal cortex. This increase in "top-down regulation" of the amygdala by the prefrontal cortex was observed while patients viewed emotional faces, suggesting that ketamine might improve PTSD symptoms, in part, by modulating responses to social signals of threat.

Findings like these have set the stage for further research to determine how the rapid and clinically significant improvement seen in PTSD patients in response to ketamine can be sustained over longer periods.

Mount Sinai is now studying whether a course of ketamine infusions combined with trauma-focused psychotherapy can result in more sustained improvement in PTSD symptoms. Dr. Feder says, "Pre-clinical studies have suggested that ketamine might enhance fear extinction learning. Our team is now beginning to examine whether this effect of ketamine can potentially be leveraged by combining infusions with psychotherapy for PTSD that is thought to work, in part, through extinction learning."
A Psychiatry-Specific Approach to Diversity, Equity, and Inclusion

Diversity, equity, and inclusion (DEI) within Mount Sinai’s Department of Psychiatry goes well beyond the reinforcement of the Mount Sinai Health System’s core institutional values. Working closely with the Health System’s Office for Diversity and Inclusion (ODI), the Department’s 40-member DEI Steering Committee stands as a tailored, psychiatry-specific initiative to foster fundamental improvement and change in a field whose past shortcomings have been top of mind among faculty in recent years.

Dolores Malaspina, MD, MS, MSPH, is Professor of Psychiatry, Genetics and Genomic Sciences, and Neuroscience, and Co-Chair of the Committee. She says, “It is absolutely vital to us that we train residents, students, and psychiatrists on the sensitive issues of social justice and diversity, as well as the elimination of race-based discrepancies in the diagnosis and treatment of our patients. We’re equally committed to having racially and ethnically diverse faculty and trainees who reflect the community we serve and are helping to evaluate and tailor our department’s recruitment practices around that essential need.”

“There’s been a longstanding history of systematized racism and oppression in our field, for which the American Psychiatric Association and the American Psychological Association have issued apologies,” says Shilpa Tauisque, PhD, Assistant Professor of Psychiatry, and Co-Chair of the Committee. “That’s given us full permission, as well as the responsibility, to openly discuss all forms of racism, bias, and...
discrimination with our patients, trainees, faculty, staff, colleagues, and our leaders."

The Committee has organized wide-ranging activities, including a lecture series open to the public. The series features speakers from diverse backgrounds presenting on challenges in mental health care faced by providers, patients, and the community. For example, the inaugural lecturer in January was psychologist Hawthorne Smith, PhD, an outside expert in refugee trauma and the survival of torture.

In addition, the Committee works with ODI to implement Mount Sinai’s system-wide initiatives such as “Chats for Change,” which facilitates informal discussions among colleagues that are held within medical units during staff breaks. Committee members have also provided spontaneous support to Asian-American students and faculty who have been targets of hatred and violence in New York City.

On a broader scale, the Committee is evaluating and developing policies and practices that will move the needle in four areas that are critical to the Department of Psychiatry: recruitment and retention, trainee and faculty education and training, delivery of clinical services, and diversity in research.

Offering a welcoming environment for a culturally and racially diverse faculty is a major priority. "We need to recruit them, retain them, and draw on their vast wisdom," says Dr. Malaspina. "In those ways, we demonstrate that we’re a progressive department where underrepresented faculty in medicine want to be."
Helping Employees Develop Resilience Goes Well Beyond COVID-19 at Mount Sinai

Early in the pandemic, the Mount Sinai Health System created the Center for Stress, Resilience and Personal Growth to help frontline health workers cope with the psychosocial trauma they were experiencing. Today, the program is more popular than ever, as employees enroll in workshops that help them build strength and resilience into their professional and personal lives. The Center has gained national visibility and stature as well, and serves as a model for other institutions.

“We’ve evolved from being COVID-oriented to addressing issues that enable people to do their jobs well, find meaning in their work, and feel part of a team,” says Deborah Marin, MD, Director of the Center for Stress, Resilience and Personal Growth, and George and Marion Blumenthal Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai. Under Dr. Marin’s leadership, the Center has grown in size to include 15 psychiatrists, psychologists, and social workers. “There’s always been a need for a program like this that can help people navigate the daily stressors of their jobs by building resilience. Instead of making it an add-on, though, we’re integrating the program into the training curricula for residents, fellows, nurses, physicians, and other health care workers at Mount Sinai.”

The success of the effort is evident in the more than 180 virtual and in-person workshops conducted to date. Each workshop consists of five meetings focused on different resilience topics, such as realistic optimism, facing fears, the importance of social support and resilience role models, and meaning and purpose. No two workshops are the same.

“One of the reasons for our success is that before holding a workshop we meet with key stakeholders, such as nurse managers, residency program directors, and wellness champions, to learn about their concerns and challenges,” says Jonathan DePierro, PhD, the Center’s Clinical and Research Director and Assistant Professor of Psychiatry. Dr. DePierro leads many of the sessions with Craig Katz, MD, Clinical Professor of Psychiatry, Medical Education, and System Design. He says, “We want the workshops to be relevant to them, instead of a boilerplate offering.”

For the 20 residency and fellowship programs that have joined forces with the Center so far, that tailoring includes offering employees a greater understanding about the biology of resilience—including its underlying physiology. Nursing units whose members face increasing rates of burnout and exhaustion are also making room in their hectic schedules for the group workshops. In July, nurse managers and educators at Mount Sinai West appeared on CBS This Morning to discuss their positive experience with the program.

More than 1,000 Mount Sinai employees have also downloaded an app known as the Wellness Hub to access the benefits of the Center for Stress, Resilience and Personal Growth on their smartphones. Developed in partnership with the Hasso Plattner Institute for Digital Health at Mount Sinai, the Wellness Hub allows users to assess their well-being through confidential tools, including a depression and anxiety screener, and to engage in self-guided activities to improve well-being.

In October 2020, the Center started a confidential faculty practice, supplementing MSHS’s ability to provide timely evidence-based behavioral health care to all Mount Sinai faculty, staff, and trainees. More than 350 employees have experience with the program.

Complex Case: Atypical Psychosis and the Value of an Individualized Approach

A 26-year-old man hospitalized for acute psychosis was found 11 days later to have a cerebral venous sinus thrombosis (CVST)—a rare form of stroke—that challenged clinicians to pinpoint the actual source of his psychiatric symptoms and determine the most effective course of medication. His eventual return to normalcy after the discontinuation of all medicines holds an instructive lesson for professionals about the treatment of a condition that crosses the line between psychological and neurological.

In October 2020, the young man, who had no prior psychiatric history, was brought to The Mount Sinai Hospital by his family after experiencing auditory hallucinations, along with paranoid and suicidal ideation over several days. While still in the hospital a week-and-a-half later, he developed a severe headache with vomiting. An MRI showed thrombosis of two sinuses on the right side of his brain, for which anticoagulation therapy was started. He was also given the psychiatric medicines aripiprazole, fluoxetine, mirtazapine, and lithium at therapeutic doses.

After a slight improvement five weeks into his hospitalization, he was discharged to a step-down program at Mount Sinai known as the Partial Hospital Program with daily group therapy. His medication regimen was also changed: lithium and mirtazapine were discontinued, and aripiprazole was cross-titrated to ziprasidone. The patient continued to hear disturbing voices...
have benefited from this service across more than 2,500 visits, largely over telehealth platforms to lower barriers to engagement.

The Center has also expanded its reach outside Mount Sinai. One effort involves training faith-based leaders in New York City’s Bronx and Harlem neighborhoods to deliver resilience workshops to members of their congregations, many of whom were deeply affected by COVID-19. Dr. Marin says this program builds upon the relationships she began cultivating four years ago as Director of the Center for Spirituality and Health at Mount Sinai. Forty workshops have been held so far, with initial funding from a private foundation. The Center is also building partnerships with outside institutions facing similar challenges. According to Dr. DePierro, “Building resilience to help employees handle challenges in their lives is clearly a growing field, and we’re helping to pave the way with the clinical, research, and educational work we are doing now.”

throughout the day, however, leading to demoralization. His mother told doctors that he would stare into space and constantly appear lethargic. She was upset that he was still symptomatic after an aggressive course of treatment.

In January 2021, Susan Kahane-Pierre, MD, Assistant Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai, became the patient’s psychiatrist after he completed the partial hospitalization program. Concerned about his persistent symptoms, she switched him from ziprasidone to the antipsychotic haloperidol, and within a day the young man’s auditory hallucinations had ceased.

His slowness did not improve, however, even with a subsequent reduction of haloperidol and fluoxetine. At that point, the patient’s mother—who was in constant touch with the doctors—requested that both medicines be discontinued. Dr. Kahane-Pierre discontinued them with close monitoring. The patient’s reactivity, gait, hygiene, and vision immediately normalized, and his family reported a return to “his usual outgoing self” and general state of well-being. Since then, the patient has continued a return to good health with no psychiatric medicines and a resolution of the thrombosis with no signs of permanent damage, as documented by imaging.

With his health and confidence on the upswing, the patient started a full-time job. Auditory and tactile hallucinations did return, however, and have persisted without other signs or symptoms of psychosis. He feels much more able to cope with them and more able to function than last winter and has been able to maintain full-time work. The team referred him to the National Alliance of Mental Illness’s (NAMI) hearing voices group and has planned further screening tests for possible medical causes of atypical psychosis.

“At this point, it does not seem likely that the CVST caused the psychosis, as there were no signs of parenchymal damage and other neurological deficits from the CVST, and as hallucinations have persisted months after the thrombosis cleared,” says Dr. Kahane-Pierre. “The psychosis appears to be an atypical form of psychosis characterized solely by auditory and tactile hallucinations. While antipsychotic medication is extremely helpful and life-changing for many patients, this case serves as a reminder of how some cases of first episode psychosis can be managed with timely discontinuation of antipsychotic medication and with ongoing psychiatric monitoring and support.”
Lotje de Witte, MD, PhD, Assistant Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai, and her lab have become leading experts in the rapidly expanding field of cerebral organoids. Their work is adding to a body of knowledge about how the human immune system and its resident microglia contribute to neurodegenerative and neurodevelopmental disorders.

Dr. de Witte’s stem cell-derived organoid models are, for the first time, allowing scientists to study the cellular development and intercellular interactions among microglia and other cell types within a 3D human brain microenvironment. This has led to the discovery that these cells can innately develop within cerebral organoid models, providing a vivid window with which to study the structural, functional, and molecular mechanisms underlying microglia development, function, and dysfunction in the human brain.

Scientists have known for some time that the immune system is involved in neurological and psychiatric conditions, and the mechanistic insights now offered by organoid models could potentially lead to screening for, and the development of, important new therapies for patients. Cerebral organoids are generated by culturing embryonic stem cells or induced pluripotent stem cells into small balls of human brain-like tissue. With the help of a biochemical cocktail of proteins and minerals they grow and self-assemble in the lab dish, mimicking development of the fetal brain in the womb and forming specialized central nervous system regions such as cortex, hippocampus, and retina.

A major thrust of Dr. de Witte’s research is exploring the impact of the environment on disease. “We know that disorders such as autism and schizophrenia are partially caused by genetic factors, but cerebral organoids are allowing us to study their interaction with environmental triggers,” she says. In a study now underway, the team is exposing cerebral organoids to dietary changes in amino acid composition and has observed a reduction in cell size, as well as the upregulation of inflammatory pathways. Through such findings, the researchers hope to learn what cellular and molecular mechanisms are disrupted in neurodegenerative and neurodevelopmental diseases.

“I think we’re close to finding these mechanisms in Alzheimer’s disease and autism, and especially in the syndromal forms of neurodevelopmental disorders,” Dr. de Witte says. “And once we know which molecular pathways are affected we could be a step closer to screening for drugs that could mediate those pathways.”

The key to these breakthroughs will be the development of human organoid models that allow them to answer specific questions about the human brain. How are microglia involved in the development of human neurons and astrocytes, including processes such as neurogenesis and synaptic pruning? Can these models be optimized to help scientists better understand the role of microglia, macroglia, and neurons in neurodevelopmental diseases, particularly those such as autism and schizophrenia that have a clear genetic component?

“Cerebral organoids are very new and very exciting, and one of the biggest challenges facing the field is making sure our models are as robust as possible,” says Dr. de Witte. “Once we’ve mastered that we’ll be in a better position to know how neuron-microglia interactions impact the development, physiology, and pathology of the human brain.”
Physician-Scientist Training: Bridging the Gap Between Medicine and Research

The Department of Psychiatry has created a robust pipeline of physician-scientist training programs that provide residents and fellows with the resources and support they need to turn patient experience into valuable research.

“Treating patients who have psychiatric illnesses triggers ideas for trainees that might inform their research,” says Antonia New, MD, Professor of Psychiatry, Director of the Psychiatry Residency Program, and Vice Chair of Education for Psychiatry. In addition, the popularity of neuroscience among college students makes it more important than ever for Mount Sinai to encourage advanced-training opportunities for physicians to “become fluent in the languages of both medicine and research.”

Mount Sinai’s Psychiatry Residency Program offers a four-year physician-scientist track built on flexibility and specialization. Flexibility means giving trainees the maximum elective research time while they are completing the clinical training required for board certification. Trainees are expected to develop a research niche and complementary clinical expertise.

“Our physician-scientist track trainees will typically focus their research on an illness, such as schizophrenia, and we’ll facilitate specialized training in that disorder by enriching their clinical caseload with patients with that diagnosis,” says Maria de las Mercedes Perez-Rodriguez, MD, PhD, Assistant Professor of Psychiatry and Assistant Training Director for Research. “Our goal is for them to start sowing the seeds of an independent research career, and that means carving out their professional niche early on.”

Residents in the physician-scientist track also benefit from being able to work with a vast pool of faculty mentors within Mount Sinai, including geneticists, neuroscientists, molecular biologists, neurologists, and neurosurgeons. In 2021, Mount Sinai’s Department of Neuroscience was ranked No. 2 in National Institutes of Health (NIH) funding, and the Department of Psychiatry was ranked No. 7. This “think tank” environment even extends outside the walls of Mount Sinai; one recent graduate had a mentor at Rockefeller University.

Mount Sinai’s Friedman Brain Institute is another important resource for residents. “Unlike other institutions where specialties are sequestered in silos that are spread across multiple campuses, The Friedman Brain Institute provides trainees with multidisciplinary learning opportunities under one roof,” says Dr. Perez-Rodriguez, who is herself a graduate of the physician-scientist program at Mount Sinai. “These departments are in constant conversation, and you’ll often see a neurosurgeon working with a neurologist or a psychiatrist with a basic scientist. These interactions result in the kind of cross-pollination and exchange of ideas that can lead to groundbreaking research.”

By the time residents emerge from four years of physician-scientist training, many are prepared to launch careers as principal investigators with their own labs. Dr. New says Mount Sinai has been successful in training physician-scientists to receive a coveted NIH Research Career Development Award (“K award”) to continue their early career research. “Among the goals of our program is to graduate trainees who are ready to secure a Career Development Award, and we’ve had tremendous success in that domain,” she says.

The Department of Psychiatry has also been successful in keeping highly sought-after physician-scientists within the Mount Sinai-fold upon graduation, with a retention rate of more than 50 percent within the past five years. “We know what it takes for physicians to succeed and to launch their careers in research,” Dr. New says. “We’re essentially building a pipeline that stretches from medical school to faculty so we can offer all the elements of world-class training within our institution.”

For physician-scientists who need additional research training after their psychiatry residency, the Department of Psychiatry recently launched a postdoctoral T32 fellowship titled Training the New Generation of Clinical Neuroscientists. “Our NIMH-funded T32 is designed to train mental health clinicians to lead original translational research in serious mental illness and to bridge the gap between basic neurobiology and clinical disease,” says Dr. Perez-Rodriguez.

Through this fellowship, she hopes to train more clinical neuroscientists who can translate the most recent advances in neuroscience into better care for patients with serious mental illnesses.
Endowed Professorships in Psychiatry

Endowed chairs are among the highest honors conferred in academic medicine and represent an investment in each faculty member’s continued success. In 2021, two professors from the Department of Psychiatry received this honor: Rita Goldstein, PhD, and Rachel Yehuda, PhD.

**Rita Goldstein, PhD**
Chief, Neuropsychomaging of Addiction and Related Conditions Program
Professor, Psychiatry, Neuroscience

Dr. Goldstein’s Neuropsychomaging of Addiction and Related Conditions Research Program at Mount Sinai studies human brain function related to behavior, cognition, emotion, and personality, with a focus on drug addiction. Recognized nationally and internationally for her neuroimaging and neuropsychological studies in drug addiction, Dr. Goldstein formulated a theoretical model known as Impaired Response Inhibition and Salience Attribution (iRISA). Multiple neuroimaging modalities—including MRI, EEG/ERP, PET—and neuropsychological tests are used to explore the neurobiological underpinnings of IRISA in drug addiction and related conditions. Dr. Goldstein’s model has drawn considerable scientific attention. Widely cited reviews of this work were published in the *American Journal of Psychiatry* and *Nature Reviews Neuroscience*. Her research has helped facilitate the development of interventional modalities to improve cognitive and emotional function, leading to better treatment outcomes in drug addiction and other chronically relapsing disorders of self-regulation.

Mentoring is a high priority for Dr. Goldstein, and she has trained everyone from postdoctoral fellows to graduate, undergraduate, and high school students. Her trainees have published many first authorship manuscripts in top psychiatry and neuroscience journals and have become principal investigators on their own National Institutes of Health-funded grants at leading institutions.

**Rachel Yehuda, PhD**
Director, Center for Psychedelic Psychotherapy and Trauma Research
Vice Chair, Veterans Affairs for Psychiatry and Professor, Psychiatry, Neuroscience

Dr. Yehuda’s Center for Psychedelic Psychotherapy and Trauma Research at Mount Sinai integrates sophisticated brain imaging and molecular neuroscience in post-traumatic stress disorder (PTSD) with clinical trials using psilocybin and MDMA-assisted psychotherapy and other related medicines, and also serves as a leader in training and education in the psychedelic-assisted psychotherapy space. A recognized expert in the field of traumatic stress studies, Dr. Yehuda’s research previously focused on the study of the enduring effects of trauma exposure in multiple populations such as combat veterans, Holocaust survivors, victims of interpersonal violence, and 9/11 survivors and first responders. These studies have examined the relationship between the biological and psychological changes associated with trauma.

Dr. Yehuda’s pioneering work has resulted in an understanding of the epigenetic changes associated with trauma and PTSD, and the molecular alterations associated with intergenerational trauma. Her laboratory has investigated novel treatment approaches for PTSD and the biological factors that may contribute to differing treatment outcomes in order to develop personalized medicine strategies for treatment-matching in PTSD, resulting in an approved U.S. patent for a PTSD blood test. Her laboratory is also using advances in stem cell technology to examine PTSD gene expression networks in induced neurons.