

A NEW CHAIR



René S. Kahn, MD, PhD

René S. Kahn, MD, PhD, a world-renowned researcher in brain disease, has returned to the Mount Sinai Health System after more than 20 years, as Chair of the Department of Psychiatry.

Dr. Kahn, the newly appointed Esther and Joseph Klingenstein Professor of Psychiatry, has dedicated his career to studying psychotic disorders, particularly the origins and treatment of schizophrenia. Most recently, he served as Professor of Psychiatry and Director of the Brain Center Rudolf Magnus at the University Medical Center Utrecht in the Netherlands.

The author of 800 research papers and book chapters, he has made major findings that have helped inform clinical work in the field. One of his seminal discoveries was that schizophrenia starts in the early teenage years, earlier

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Mount Sinai Participates in Landmark Study of Adolescent Brain Development

The Icahn School of Medicine at Mount Sinai will receive \$4.7 million from the National Institutes of Health (NIH) to participate in a five-year, landmark study with 20 other research centers that will examine how childhood experiences and habits affect brain development and, ultimately, social, behavioral, academic, and health outcomes.

The NIH initiative, known as the Adolescent Brain Cognitive Development (ABCD) study, will follow approximately 10,000 children for 10 years, beginning at ages 9 and 10, through adolescence, and into early adulthood. Researchers will use advanced brain imaging, interviews, and behavioral testing to determine how video games, school sports, sleep habits, social media, smoking, alcohol, and drug use interact with each other and with a child's changing biology to alter the development of the brain over the short and long terms.

Rita Goldstein, PhD, Professor of Psychiatry, and Neuroscience, and Chief of the Neuropsychimaging of Addiction and Related Conditions research group and the Brain Imaging

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Autism Research and Community Engagement are Tightly Linked at Mount Sinai's Seaver Center

One Saturday morning each month, the American Museum of Natural History in New York City opens its doors an hour early to welcome a special group of visitors: children with autism and their families. What they experience is more than a simple stroll through the museum's labyrinthine exhibition halls. Specialists at the Seaver Autism Center for Research and Treatment at the Icahn School of Medicine at Mount Sinai have taught museum tour guides and volunteers how to engage and interact with children with autism spectrum disorder (ASD). The Seaver Autism Center has also developed social stories, visual cues, and prompt cards for these visitations and has chosen to tour specific halls (Dinosaurs, North American Mammals, Planet Earth, and Ocean Life) based on their ability to meet the children's sensory needs.

The 3-year-old program has been "hugely successful," says Michelle Gorenstein-Holtzman, PsyD, Assistant Professor of Psychiatry at the Mount Sinai Health System and Director of Community Outreach for the Seaver Autism Center for Research and Treatment. Specialized tours of the museum



Michelle Gorenstein-Holtzman, PsyD

are continually booked, and exhibits are being added to keep up with the program's popularity.

"I think you're going to see more and more museums adopt specialized programs such as this, due to the growing demand," says Dr. Gorenstein-Holtzman. She is helping the Long Island Children's Museum—where she is an advisory board member—develop such a program.

The museum connection is a natural fit for the Seaver Center, which uses community outreach to share its knowledge and resources with patients and families across the tri-state area. Supported by a grant from the UJA Federation of New York, Dr. Gorenstein-Holtzman develops evidence-based social skills programming for children, adolescents, and young adults with ASD. The children's lessons focus on play and conversational skills, while the newly developed young adult curriculum focuses on employment-based social skills.

Citywide outreach also takes the form of a Community Lecture Series held at schools and local meeting halls and a Distinguished



Lecturer Series that shares the latest autism research in areas such as epidemiology, genetics, and early detection that are relevant to caregivers and professionals. "What's unique about the Seaver Center is that we don't confine our research to the lab," says Dr. Gorenstein-Holtzman. "We're continually disseminating our findings to the community so that they have greater meaning."

In addition, the Seaver Center is translating its materials into Spanish and offering its services to Spanish-speaking families. Pilar Trelles, MD, a child psychiatrist and Seaver Clinical Fellow, is the principal investigator on a research project that partners Latino families of children who are newly diagnosed with

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than previously thought, and that the first cognitive symptoms usually precede the first psychosis and visit to the psychiatrist by 10 years. "This is very important because we now know if we want to understand the illness and identify people at risk, we have to look much earlier in the process," says Dr. Kahn.

Using neuroimaging, Dr. Kahn has uncovered progressive changes in the brain over the course of schizophrenia that are linked to its severity. In his new role as Chair, he plans to establish a high-risk clinic to identify and treat individuals at an early age who are likely candidates for a range of psychiatric illnesses, as well as drug abuse. "A specialized clinic of this type will have a major impact scientifically, as well as on the overall health care system, and New York's

population, in particular," he says.

A member of the Royal Netherlands Academy of Science and a former Fulbright Scholar, Dr. Kahn completed a four-year psychiatry residency at The Mount Sinai Hospital and was appointed to the Icahn School of Medicine at Mount Sinai faculty in 1992. He conducted schizophrenia research and served as Research Unit Chief at the James J. Peters VA Medical Center in the Bronx, before returning to the Netherlands. For two decades, Dr. Kahn has maintained an adjunct appointment at Mount Sinai to continue his collaborations with faculty members.

"I am delighted that Dr. Kahn is joining us," says Kenneth L. Davis, MD, President and Chief Executive Officer of the Mount Sinai Health

System. "His medical acumen is evidenced by the honors and accolades awarded to him throughout his noteworthy career."

When Dr. Kahn received an endowed professorship at Mount Sinai's Convocation Ceremony in September, he told the audience that his two professional mentors were Dr. Davis and 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, both of whom have made significant discoveries in neuroscience.

"My two mentors are together," he said, "having built one of the best medical schools in the United States and probably the world, and I am extremely honored to be part of that."



autism with “peer advocates” in their community. The peer advocates are actively engaged parents with special needs children themselves, who have received training from the state. They help newcomers navigate the system, which can often seem complex and overwhelming.

“One of the things that’s important to us is reaching out to minority families, who have little idea what we do or how to access the programs we provide,” says Dr. Trelles. “Peer advocates understand what these families are going through and can relate to them in ways that others can’t. They’re able to give them hope that things are going to get better and that their children are going to get the help they need.”

Smoking and Tourette Syndrome

Children whose mothers smoked ten or more cigarettes a day during pregnancy had a 66 percent greater risk of developing Tourette syndrome (TS) or other chronic tic disorders (CT) than children of nonsmoking mothers, according to research published by the Icahn School of Medicine at Mount Sinai. The children of heavy smokers also had a more than two-fold risk for developing TS and CT in combination with attention-deficit/hyperactivity disorder.

These results represent the largest investigation to date of the link between prenatal smoking and childhood risk for TS and CT. The findings appeared in the September 2016 issue of *The Journal of the American Academy of Child & Adolescent Psychiatry*.

The Mount Sinai team, in collaboration with investigators from Aarhus University in Denmark, analyzed data from the Danish National Birth Cohort, which included information about lifestyle, health, and health behavioral information (including maternal smoking and other substance use) of more than 100,000 women enrolled early in their pregnancies from 1996 to 2002.

“By better understanding the genetic and environmental factors associated with TS we get a more comprehensive picture of the risk architecture, along with the brain systems and brain chemistry that are affected,” says the study’s senior author, Dorothy Grice, MD, Professor of Psychiatry at the Icahn School of Medicine, and Director of Mount Sinai’s Obsessive-Compulsive and Related Disorders Program. “That kind of information, in turn, allows us to figure out ways to either modulate the exposure of individuals or prevent the risk from ever occurring.”

The size and detail of the Danish National Birth Cohort allowed researchers to look at grades of exposure—from light to heavy smoking—and to account for maternal age, maternal mental health, socioeconomic status, partner smoking habits, gestational age, birth weight, and more.

Although the birth cohort is still young, the study suggests that maternal smoking during gestation also increases the risk of obsessive-compulsive disorder (OCD), which is known to share risk factors with TS and CT. “Knowing what the risk factors are will not only help us provide more accurate and earlier interventions, but will support the development of new compounds that offer more effective treatments for TS, CT, and OCD,” says Dr. Grice.

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Core at the Icahn School of Medicine, is Mount Sinai’s principal investigator on the study. Dr. Goldstein and her team will collaborate with Yale University to recruit more than 1,000 children, an effort that will unfold over the next two years through partnerships with public and private schools.

The ABCD study is “a paradigm shift for the brain development study,” says Dr. Goldstein. “Multimodal neuroimaging studies to uncover brain mechanisms that could change over time with development and shed light on health, resilience, and vulnerability factors have not been conducted at this scale before, making this project both exciting and crucially important.”

An additional partnership with BJ Casey,

PhD, the study’s principal investigator at Yale, will enable Dr. Goldstein’s team to study the cortical-subcortical pathways that underlie select behaviors that are crucial during the adolescent years.

“Such early identification of the dynamics of brain states, pathways, and mechanisms is crucial for enhancing the understanding of factors that may contribute to certain behaviors,” says Dr. Goldstein. “We will also be able to identify the brain circuits and pathways that may predispose to or protect against certain risks. The identification of mechanisms underlying resilience has always been an important focus at Mount Sinai.”

Ultimately, the study is expected to

provide parents, school principals and teachers, medical professionals, and public policymakers with useful data to promote the health, well-being, and success of children.

“We know the brain is still developing well into the mid-20s, making it vulnerable to a host of influences,” said NIH Director Francis S. Collins, MD, PhD, in announcing the initiative. “With several NIH institutes and centers working together on this important study, we will be able to learn how a variety of biological events and environmental exposures affect brain development, giving us greater insight into what helps adolescents traverse that potentially tumultuous time to become healthy and productive adults.”

Using Teeth as a Biomarker for Schizophrenia

Lead is known to adversely affect early neurodevelopment in children, but its impact on adult schizophrenia or psychotic illness has been a source of much debate. Scientists from the Department of Psychiatry at the Icahn School of Medicine at Mount Sinai, in collaboration with researchers from the University of Amsterdam, and the Institute of Psychiatry, Psychology, and Neuroscience at King's College London, recently decided to test this connection. Using shed deciduous teeth as potential biomarkers, they reported that an association stemming from early life exposure does exist. Their findings appeared in the August 2016 edition of *European Psychiatry*.

"By using teeth, which act like a chemical repository, we were able to reconstruct exposure from the mother's second trimester through the child's first year of life," says the study's lead author, Amir Modabbernia, MD, a psychiatry research resident at the Icahn School of Medicine. He says previous methods of measuring exposure during the child's development were deemed unreliable because they could not provide direct in utero information.

"When deciduous teeth are forming, enamel and dentine deposition occurs in a rhythmic manner, forming incremental lines akin to growth rings of a tree," says Dr. Modabbernia. "We can then identify parts of the tooth formed at different times by using daily growth rings."

To measure actual exposure, the researchers relied on sophisticated laser ablation inductively coupled plasma mass spectrometry imaging developed by Mount Sinai's Department of Preventive Medicine. This unique technique, says Dr. Modabbernia, allowed them to identify transitions in metal uptake, and made it possible to construct exposure histories.

The proof-of-concept study involved the teeth of nine individuals from Genetic Risk and Outcome of Psychosis (GROUP), a prospective cohort of 1,120 patients with psychotic disorders in the Netherlands, and five healthy controls.

From this data, a significant pattern emerged that linked exposure to lead during early

development with schizophrenia. The data also suggested that the prenatal period is a critical time when exposure to lead can have a substantial impact on intellectual development. In addition to lead, researchers found "critical windows of susceptibility" for several other metals, such as manganese, copper, and zinc, which could have toxic effects on the brain at higher levels.

Dr. Modabbernia says the team's work could pave the way for an even larger study that will dig more deeply into the deleterious effects metals and chemicals may have on mental disorders later in life. "If the association is found to be causal," he adds, "then public health strategies to prevent exposure and/or treatment with chelators, could be very useful in mitigating the risk of mental illness."

Also, Dr. Modabbernia is greatly encouraged by the team's successful use of the tooth biomarker, and its implications on future research. "Our novel biomarker provided, for the first time, direct in utero evidence, and it's quite valuable in assessing environmental exposures during pregnancy," he says.

Eating Disorders Program Integrates New Treatments

In a little more than a decade, the Mount Sinai Health System's Eating and Weight Disorders Program has grown more than six-fold to 6,000 patient visits in 2016, making it the largest and most respected outpatient program of its kind in New York City. Its advanced family-based programs for adolescents and Acceptance-based Mirror Exposure Treatment (A-MET) program for patients with body-image concerns serve as models for other institutions. In 2017, the program expects to roll out new smartphone and telemedicine applications.

"What we do exceptionally well is execute leading-edge, empirically supported treatments for people ages 8 to 80 across the whole weight spectrum," says Tom Hildebrandt, PsyD, Chief of the Eating and Weight Disorders Program. "We've made a particularly strong investment in families and caregivers of people with eating and weight disorders, and provide the only family-based outpatient program in the tri-state area for adolescents. Our goal is not to

pull patients out of their support environment, but treat them as part of the entire family unit so they can get better."

The Mount Sinai Intensive Care Program (MOSAIC) immerses family members in the treatment of loved ones with disorders, such as anorexia nervosa, bulimia nervosa, binge eating, and restrictive food intake. Training includes inviting family members to have meals with MOSAIC staff, who coach them on how to feed their loved ones. According to Dr. Hildebrandt, the intensive therapy "teaches patients and families specific skills on how to get through meals and how to become nutritionally rehabilitated."

The Eating and Weight Disorders Program is comprised of 20 members: psychologists, psychiatrists, mental health counselors, and a dietician. These specialists use



Tom Hildebrandt, PsyD

Enhanced Cognitive-Behavioral Therapy, which teaches patients active coping skills that can lead to symptom reduction and guard against relapse. They also use the A-MET program, which was developed at Mount Sinai, and works by having the patient describe his or her body while looking in the mirror, and having the therapist redirect the language so that it is nonjudgmental.

The use of smartphone technology and telemedicine, which will allow patients to engage in therapy remotely, are in the late stages of development.

"They have the potential to make treatment more convenient and accessible for our patients," says Dr. Hildebrandt. "Our goal is to get people out of the classic psychiatry model of being stuck in an office and, instead, use the latest technology to integrate treatment into their active, daily lives."