Mount Sinai and Sema4 Launch Groundbreaking Asthma Study With Global Pharmaceutical Company

Asthma, a chronic disease of the airways of the lungs, is a growing public health problem that now affects 350 million people and results in about 400,000 deaths worldwide each year. Its diagnosis and treatment remain challenging, however, and debilitating symptoms, such as coughing and shortness of breath, are a major cause behind rising health care costs, missed school for children, and loss of productivity and early disability in adults.

Recently, the Mount Sinai Health System and Sema4—a patient-centered predictive health company and a venture of Mount Sinai—joined with Sanofi, one of the world’s largest pharmaceutical companies, to follow 1,200 Mount Sinai patients to gain unprecedented insights into the biological mechanisms and environmental factors implicated in this condition.

The five-year study—the first of its kind—will collect traditional clinical data, such as electronic medical records and clinical samples, including blood samples and nasal brushings, from patients during their doctor appointments. The data will be analyzed for genomic and transcriptomic information and combined with other data collected using the patient’s mobile phone—environmental data, like air quality and pollen counts, data from the patient’s asthma inhaler, and data from home monitoring of activity and sleep. One of the unique elements of this study is that the research will be incorporated into actual clinical practice, and

New Pathway to Treating Rheumatoid Arthritis Identified

A new gene associated with disease severity in rheumatoid arthritis (RA), has been identified by researchers at the Icahn School of Medicine at Mount Sinai. This finding could provide a new pathway for treatment and a way to measure the prognosis of patients diagnosed with this autoimmune condition.

Through a series of experiments, Péricio S. Gulko, MD, Chief of the Division of Rheumatology, and the Lillian and Henry M. Stratton Professor of Medicine (Rheumatology), and his colleagues showed that Huntingtin-interacting protein 1 (HIP1) is a driver in inflammatory arthritis severity. The findings were published in July 2018 in the *Annals of the Rheumatic Diseases.* “It is known that this gene is expressed in some cancers, but precisely how it contributed to cancer was not known, and it has never been implicated in inflammation or arthritis. So this new discovery, that it regulates cell invasion, is completely novel,” says Dr. Gulko, senior author of the paper.

Péricio S. Gulko, MD, with images of synovial fibroblasts, cells in the joints that are central to his study of rheumatoid arthritis.

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real-world data using remote devices will be integrated with molecular data.

“Despite advances in recent years, we still see many patients struggling with asthma, so there is a tremendous need for innovation to reduce the burden of this disease,” says Linda Rogers, MD, Associate Professor of Medicine (Pulmonary, Critical Care and Sleep Medicine) and Clinical Director of the Adult Asthma Program at the Mount Sinai – National Jewish Health Respiratory Institute. Dr. Rogers is the clinical principal investigator of the study, which is a collaboration among the Respiratory Institute, the Icahn Institute of Genomics and Multiscale Biology, Sema4, and Sanofi.

The Respiratory Institute is uniquely positioned to undertake this research. In addition to the large number of asthma patients that the program treats, the Mount Sinai and Sema4 study team have unparalleled capabilities in specimen analysis, data science, and multiscale biological modeling, allowing researchers to gather large amounts of data more rapidly than using more traditional research methods.

Clinical research teams will deploy advanced analytics on this information to better understand how the disease functions, including what triggers asthma attacks and which patient segments are most likely to respond to certain therapies. “This collection of large amounts of multiple types of data is needed to fully understand asthma—a condition researchers now believe is far more complex than was previously understood—and how best to treat patients,” says Tom Neyarapally, Sema4’s Chief Commercial Officer.

Significantly, gathering and analyzing these kinds of data from patients will demonstrate at the molecular level how their bodies are responding to asthma, says Andrew Kasarskis, PhD, Executive Vice President and Chief Data Officer for the Mount Sinai Health System and a co-principal investigator of the study. For example, analysis of a blood sample will show changes in the cellular activity, such as which proteins are being produced, and a nasal swab may reveal important clues about one’s immune response and what is happening in the lungs. “We will define asthma subtypes clinically, then understand the molecular basis of disease in each subtype in order to discover new therapies and better manage asthma in all our patients,” says Dr. Kasarskis.

Ultimately, adds Erik Lium, PhD, Executive Vice President of Mount Sinai Innovation Partners, “this collaboration may lead to the identification of novel drug targets and the development of groundbreaking therapies to benefit all patients with asthma.”
The Mount Sinai AppLab Forges an Academic Home for Evidence-Based Digital Medicine

As the field of digital medicine rapidly produces novel innovations for a wide patient population, the Mount Sinai Health System’s AppLab is creating applications that provide meaningful benefits to both patients and health care providers.

Led by Ashish Atreja, MD, MPH, FACP, Associate Professor, Medicine (Gastroenterology), and Chief Innovation and Engagement Officer, Icahn School of Medicine at Mount Sinai, the AppLab comprises data scientists, software developers, and population health coordinators whose digital solutions for clinical and research objectives adhere to the stringent, evidence-based safeguards of traditional medicine.

To date, the AppLab has built and validated apps and other digital medicine solutions for numerous diseases and use cases. In 2017, the group launched RxUniverse, a software platform that curates clinically validated health apps. This led to the launch of Rx.Health, a Mount Sinai spinout company focused on seamlessly integrating evidence-based digital tools into health care systems. Commercialization of Rx.Health was led by Mount Sinai Innovation Partners, which facilitates the real-world application of Health System innovations as early as product ideation.

The AppLab has created a dozen stand-alone apps, developed various micro apps on the RxUniverse platform, and participated in more than 25 funded projects. In the past year, it has conducted a project at The Mount Sinai Hospital that monitors recently discharged heart failure patients through an app and connected Bluetooth devices. Through the RxUniverse platform, the AppLab also provides pertinent information and preparatory support for patients prior to colonoscopy procedures. Pfizer Inc. has provided the AppLab with a grant to study ways to improve vaccinations in inflammatory bowel disease patients. Additionally, the AppLab participates in a project with the New York State Department of Health AIDS Institute to improve care among young adults with HIV.

“The proliferation of apps and new technologies makes it difficult to determine what truly has evidence,” says Jason Rogers, Program Manager, Mount Sinai AppLab. “We try to build software solutions that meet the challenge and build a community to share knowledge.”

The AppLab leads one of the many efforts at Mount Sinai to implement digital health solutions. Open-MIC (Mount Sinai Innovation Champions) is a monthly, collaborative group where individuals meet to share their success stories and what they have learned. Additionally, a Mobile Application Executive Committee was recently formed to develop guidelines for app implementation and branding.

Dr. Atreja says he is encouraged by advances in apps such as MyChart and those within the RxUniverse that allow patients to access their own medical records. “In the next few years, we will see the prescription of apps become mainstream,” he adds. But it is essential that they are rigorously tested to prevent potentially harmful technologies from reaching patients.

“We have touched tens of thousands of patients’ lives and feel we can increase that,” says the AppLab’s Program Manager, Mr. Rogers. “It is about building out use cases for particular care pathways and scaling up the engagement so we can help more patients.”

Those interested in launching a mobile app are requested to reach out to Rebecca Lingner, Director, Branding, Mount Sinai Health System (rebecca.lingner@mountsinai.org).
Cloning, the researchers identified gene resistant. Using a technique called positional highly susceptible to RA and those that were patients with RA, they grow out of control, lubricates and nourishes the cartilage, but in all joints and produce the fluid that damage, and this led us to the synovial tissue

The disease causes pain, swelling, and sometimes deformation of joints and affects about 1 percent of the world’s population. In the last 20 years, there have been major advances in the treatment of RA, but the existing treatments immunosuppress patients, increasing the risk for infections. “At my laboratory, we have been looking for alternative strategies,” Dr. Gulko says. “We have focused on understanding the regulation of disease severity and joint damage, and this led us to the synovial tissue and the fibroblasts.” These cells are present in all joints and produce the fluid that lubricates and nourishes the cartilage, but in patients with RA, they grow out of control, invading and destroying cartilage and bone.

Dr. Gulko’s team started with rodent models of arthritis, studying animals that were highly susceptible to RA and those that were resistant. Using a technique called positional cloning, the researchers identified gene variants that control arthritis severity and the behavior of the synovial fibroblasts, finding that HIP1 made the cells highly invasive. Next, the team studied synovial fibroblasts from patients with RA and found that HIP1 was strongly expressed in those cells. To test the finding further, the team used a molecular biology technique to “knock down,” or remove, HIP1 from the cells of RA patients, and found that this significantly reduced the cells’ ability to invade.

The team unexpectedly found further evidence implicating HIP1 while collaborating in a study of RA and epigenetics, the environmental influence on genetics. The study, which was published in May 2018 in Nature Communications, compared the synovial fibroblasts of patients with RA with those from patients with osteoarthritis, which is not considered an inflammatory disease. The researchers were looking for dysregulated genes and pathways that differentiated the two groups of patients. “One key pathway found to be epigenomically dysregulated was the Huntington protein pathway, including HIP1,” Dr. Gulko says.

Going forward, Dr. Gulko has several goals: improving the understanding of how HIP1 regulates disease; finding a way to quantify HIP1 levels in the blood or synovial fluid cells with the aim of creating a predictor of disease prognosis; and developing a drug that would target the HIP1 gene. The ultimate goal is to achieve remission for RA patients. “I treat many patients with rheumatoid arthritis,” Dr. Gulko says, “and all the work that we have done throughout my career has been centered on trying to bring a benefit to these patients.”
National Recognition for Excellence In Inflammatory Bowel Disease

Jean-Frédéric Colombel, MD, whose research has led to some of the most seminal discoveries in Crohn’s disease and ulcerative colitis—chronic inflammatory conditions that damage the gastrointestinal tract—was one of three national recipients of the 2018 Sherman Prize. The award, which recognizes individuals for pioneering achievements that have significantly transformed patient care, was presented by the Bruce and Cynthia Sherman Charitable Foundation at the Advances in Inflammatory Diseases conference Thursday, December 13, in Orlando, Florida.

Dr. Colombel, Director of The Susan and Leonard Feinstein Inflammatory Bowel Disease Clinical Center at Mount Sinai, was lauded for his highly collaborative work bringing together geneticists, microbiologists, epidemiologists, systems engineers, and clinicians to study new concepts in the causes, prognosis, diagnosis, and treatment of inflammatory bowel diseases. He also was honored for mentoring and motivating the next generation of physician scientists.

Said Dr. Colombel: “It’s a long and difficult road ahead, and it will require great collaboration among the world’s top scientists and researchers, but I think we will be able, in the near future, to predict the onset of Crohn’s disease before the first symptom appears, which creates the possibility for one of medicine’s primary aims—preventing disease.”

Mount Sinai Beth Israel Physicians Thanked for Their Exceptional Care

About 150 Mount Sinai Beth Israel physicians recently attended a reception thanking them for the exceptional care they provide to patients. The event, held in December at the National Arts Club, was organized by Dahlia Rizk, DO, President of the Mount Sinai Beth Israel Medical Board. Physicians received service pins and certificates—for up to 50 years of service—and took advantage of a rare opportunity to mingle.

“I saw so many new friends connect, and so many new bonds being made,” says Jeremy Boal, MD, President of Mount Sinai Downtown. “These links keep us strong and contribute to the incredible care we offer as a network and system.”

Carnegie Hall Fundraiser Supports Mount Sinai West Program

The Mount Sinai Health System, along with the UN Chamber Music Society at the United Nations and members of the New York Philharmonic Orchestra, partnered to host a benefit concert at Carnegie Hall (see photo) on Tuesday, January 15, in support of the Helen Sawaya Fund at Mount Sinai West, a philanthropy program whose mission is to enhance the experience of cancer patients through art, music, reflexology, and more. The fund was established in 2005 by Gabriel A. Sara, MD, Assistant Professor of Medicine (Hematology and Medical Oncology), Icahn School of Medicine at Mount Sinai, and his friend from high school, Fuad Sawaya, in memory of Mr. Sawaya’s wife, Helen, who had been a cancer patient at Mount Sinai West.

Says Dr. Sara, “Our program addresses the emotional component of the disease and helps alleviate the stress of treatment. It has had an unbelievable impact on patients’ lives and on staff experience. Art and music, especially, reach us where words cannot.”
Mindfulness and Stress Reduction
This program provides techniques to relieve stress and promote physical and mental well-being. The class is free, but space is limited. For reservations, email mickie.brown@mssm.edu.

Sponsored by the Marie-Josée and Henry R. Kravis Center for Cardiovascular Health.

Thursday, February 21
6 - 7 pm
234 East 85th Street, Lower Level

Friedman Brain Institute Neuroscience Seminar Series
Steve Finkbeiner, MD, PhD, Director and Senior Investigator, Center for Systems and Therapeutics, Gladstone Institutes, and Professor of Neurology, and Physiology, University of California, San Francisco, presents “Harnessing Human Brain Disease Models with Robotics and Deep Learning to Find Causes and Treatments.”

Thursday, February 7
1 - 2 pm
Hess Center, Seminar Room A, Second Floor

Grand Rounds / Medicine
Yasmin Hurd, PhD, Director, Addiction Institute at Mount Sinai, and Professor of Neuroscience, Pharmacological Science, and Psychiatry, presents “Neurobiology of Addiction.”

Tuesday, February 12
8:30 - 9:30 am
Hatch Auditorium

Grand Rounds / Population Health Science and Policy
Josiah Mueller, RN, BSN, MHS, Director, Health Care Analytics, Mount Sinai Health System, presents “An Introduction to the Centers for Medicare & Medicaid Services Bundled Payment Programs.”

Tuesday, February 12
1 - 2 pm
Icahn Medical Institute, Goldwurm Auditorium

Seminar Series / Occupational Medicine
Amita Toprani, MD, MPH, Medical Director, Bureau of Environmental Disease and Injury Prevention, New York City Department of Health and Mental Hygiene, presents “Population-Based Perspectives on Worker Health.”

Friday, February 15
8 - 9 am
Annenberg, Fifth Floor Felt Room

“A Conversation With a Women’s Health Trailblazer”
Vivian Pinn, MD, the first Director of the Office of Research on Women’s Health, National Institutes of Health, will be featured on Monday, February 11, in “A Conversation With a Women’s Health Trailblazer,” a panel event in celebration of Black History Month. Dr. Pinn will also be keynote speaker at The Blavatnik Family Women’s Health Research Institute’s inaugural symposium on that day. In the panel, Dr. Pinn will discuss public health issues with Elizabeth A. Howell, MD, MPP, Director of The Blavatnik Family Women’s Health Research Institute, and Gary C. Butts, MD, Chief Diversity and Inclusion Officer for the Mount Sinai Health System. The panel is sponsored by the Institute, along with the Office of Academic Development and Enrichment, The Patricia S. Levinson Center for Multicultural and Community Affairs, and the Office for Diversity and Inclusion. A reception is to follow.

Monday, February 11
4 - 5 pm
Hess Center, Davis Auditorium

RSVP is required, at amy.balbierz@mountsinai.org or 212-659-9187.

Mobile Food Ordering App

Busy schedules should not get in the way of grabbing lunch, and now they do not have to! Morrison Food Services at The Mount Sinai Hospital recently launched Nourish, a mobile food ordering app. Preorder food from the Plaza Café and Starbucks located in Guggenheim Pavilion.

Download “Nourish Ordering” in the App Store or text NOURISH to 99299

The Mount Sinai Health System complies with applicable Federal civil rights laws and does not discriminate, exclude, or treat people differently on the basis of race, color, national origin, age, religion, disability, sex, sexual orientation, gender identity, or gender expression.