Two strains of human herpesvirus—human herpesvirus 6A (HHV-6A) and human herpesvirus 7 (HHV-7)—are found in the brains of individuals with Alzheimer’s disease at levels up to twice as high as in those without Alzheimer’s, according to findings published June 21, 2018, in *Neuron* by a team of Icahn School of Medicine at Mount Sinai researchers. These common viruses, best known for causing roseola, a skin rash in children, can also be present in the brain and remain inactive for years. They also can cause encephalitis and other chronic disorders.

It is the first study to use an entirely data-driven approach to examine the impact of viruses on Alzheimer’s—and to identify potential disease-associated roles of these particular viruses, which was an unexpected discovery. The researchers had been comparing genetic data in healthy and postmortem Alzheimer’s brains to identify possible new drug targets for Alzheimer’s disease when their complex computations revealed the unusually high levels of the viral genomes.

“This study represents a significant leap forward in our understanding of how viruses may play a role in Alzheimer’s disease,” says the study’s senior author, Joel Dudley, PhD, Mount Sinai Professor in Biomedical Data Science, and the Director of the Icahn School of Medicine’s Institute for Next Generation Healthcare. “We were able to not only measure these viruses using computational techniques but also build

The Mount Sinai team that used an experimental treatment was led by interventional neuroradiologist Alejandro Berenstein, MD, and included Michelle Sorscher, RN, MSN, Clinical Program Manager, Neurosurgery.

When, in early 2017, the teacher of 14-year-old Shawn Svoboda called to say he was falling asleep in class, his mother wasn’t overly concerned, considering it typical teenage behavior. However, when the teacher called a second time that same day to emphasize she thought this was something out of the ordinary, his mom requested that their pediatrician order a sleep study, as she had noticed subtle changes in Shawn, such as snoring, pulsating neck veins, muffled voice, clumsiness, and headaches, all of which she had chalked up to changes of puberty.

The results showed Shawn was suffering from central sleep apnea at the rate of 150 episodes per hour, and a brain MRI was immediately scheduled at their local hospital in Springfield, Massachusetts. The MRI showed an extensive, potentially lethal, arteriovenous (AV) fistula—an abnormal connection between an artery and a vein—at multiple sites in the brain, creating a complex tangle of blood vessels in the dura.
More than 120 high school, college, and graduate students aspiring to a broad range of careers in health participated this summer in internships and talent pipeline programs throughout the Mount Sinai Health System. Two units of the Office for Diversity and Inclusion (ODI)—Corporate Health System Affairs and the Center for Excellence in Youth Education (CEYE)—supported initiatives to provide opportunities in medicine, science, health administration, real estate, and technology to students from underrepresented backgrounds.

“The experience that I’ve had at Mount Sinai has helped me target what type of biomedical engineer I want to become in the future,” says Awa Bagayoko, who participated in CEYE’s Nanotechnology course. “The program also reaffirmed my interest in medicine.”

This year marked the beginning of a formal partnership between Mount Sinai and the New York City Department of Education (DOE) to offer internships to high school students in the departments led by Kumar Chatani, MBA, Executive Vice President and Chief Information Officer, Mount Sinai Health System; and Kenneth Holden, Senior Vice President, Real Estate Services & Facilities. “Twenty-six interns gained hands-on experiences in information technology; planning, design, and construction; engineering; and property management,” says Shana Dacon, MPH, MBA, Assistant Director, Office for Diversity and Inclusion. “We will continue to work with the DOE to expand opportunities for students during the academic year.”

Fourteen more students—from high school to graduate school—had internships in clinical departments, patient experience, population health, and diversity management, supported by ODI in partnership with organizations including America Needs You; the All Stars Project, Inc.; the Greater New York Hospital Association; the Institute for Diversity and Health Equity; and Prep for Prep.

This year, ODI also launched Lesbian, Gay, Bisexual, and Transgender Young Queer Urban Teens for Health (LGBT YQUTH) in Medicine—a talent pipeline program for careers in health care. In the program, ODI staff and members of the Icahn School of Medicine at Mount Sinai’s Stonewall Alliance student group gave informational talks to LGBT youth organizations throughout the city. “In June, we welcomed participants from the talks to the pilot ‘Saturday at Sinai’ event,” says Richard Cancio, MPH, Program Manager for LGBT Health Services, Mount Sinai Health System. The free event included interactive activities; a tour of The Mount Sinai Hospital; and a panel of public health researchers, nursing and medical students, and graduate school alumni.

CEYE’s six-week summer internship programs attracted 75 high school students from across New York City. Students participated in the Fruit Fly Genomics or Nanotechnology research courses; the Clinical Internship program; or the Lloyd Sherman Scholars program, a two-year biomedical research program for young men of color.

CEYE’s research courses met daily, with students receiving lecture-based instruction coupled with activities in the Icahn School of Medicine’s teaching laboratories, where projects included studying the behavior of fruit flies kept in isolation, and exploring silver nanoparticles and their medical implications. Clinical Internship participants were matched with faculty and staff and shadowed them in jobs throughout The Mount Sinai Hospital. In the Lloyd Sherman Scholars program, first-year participants took a Biotechnology course, and second-year scholars were placed in mentored research labs. In another two-year program, 14 interns who worked in labs during the school year returned in the summer to continue their work, assisting in areas of study including ovarian cancer survival rates and engineered cardiac tissue. All of the research interns plan to submit their summer work to the upcoming New York City Science and Engineering Fair.

“My internship showed me how hands-on science is,” says Brandon Soto, a first-year Sherman Scholar. “It also showed me that there are a lot of problems in the world that can be solved with science.”
Stars of Hope Commemorate 9/11 Anniversary

For three days in August, faculty and staff at the Selikoff Centers for Occupational Health invited patients and visitors to create stars of hope—wooden stars with messages of support and encouragement—to adorn their walls and lift the spirits of the people who are treated there.

Located in The Mount Sinai Hospital, the Selikoff Centers focuses on the diagnosis and treatment of occupational diseases and is home to Mount Sinai’s World Trade Center Health Program Clinical Center of Excellence, which cares for more than 22,000 people who were part of the clean-up effort at Ground Zero after the attacks on 9/11. In the immediate aftermath of the attacks, responders were exposed to harmful toxins that have resulted in significant health consequences.

The Selikoff Centers’ project was a joint effort with the New York Says Thank You Foundation, which created the “Stars of Hope®” program to empower and inspire people and communities throughout the world that have been impacted by violence and natural disasters.

During the week of 9/11, the stars that were created in August will be displayed on a Tree of Hope located in the Annenberg lobby. Star makers included Mount Sinai staff, from left: Ivyany Moncion, Jasmin Vazquez, Gabriella Villacis, and Nimota Subair.

Experimental “Brain Glue” Helps Save the Life of a Teen Patient (continued from page 1)

or outer covering of the brain. Shawn was then referred for a genetics consult and a cardiology workup and met with a pediatric neurosurgeon in Connecticut.

After performing a brain angiogram, the neurosurgeon told Shawn’s parents that the condition was more extensive than originally believed and recommended that they take him to The Mount Sinai Hospital, to be seen by Alejandro Berenstein, MD, Professor of Neurosurgery, Radiology, and Pediatrics, at the Icahn School of Medicine at Mount Sinai, and Director of the Pediatric Cerebrovascular Program. Dr. Berenstein is a world-renowned interventional neuroradiologist who has vastly expanded the understanding and treatment of vascular abnormalities in the brain, pioneering the use of innovative substances to incrementally block off these abnormal blood vessels.

Without treatment, Dr. Berenstein says that Shawn was at risk for developing more neurological deficits, seizures, hemorrhage, or stroke. “He was a walking time bomb,” says his mom, Bonnie Kmon, RN, and an oncology certified nurse. Typically, Dr. Berenstein would treat an AV fistula by injecting a standard medical-grade super glue—a lava-like embolism agent—through a catheter to seal the blood vessel, guided by real-time X-ray imaging. Shawn’s situation was more complex: the extensive quantity needed would appear black in the X-ray, making it impossible for the surgical team to see what they were doing.

Dr. Berenstein was familiar with a different, liquid embolic super-glue substance being used outside of the United States called PHIL™ (Precipitating Hydrophobic Injectable Liquid), which is less dense and, using iodine, appears grey, instead of black, on an X-ray, making it possible to clearly see the areas being treated. However, PHIL has not yet been approved by the U.S. Food and Drug Administration (FDA), so Dr. Berenstein and his team successfully petitioned the FDA to grant approval for a single patient compassionate use of PHIL, making Mount Sinai the first institution in the nation to use this agent.

Dr. Berenstein was able to block off the abnormal blood vessels a few at a time. The procedure had to be done in stages to allow the brain and heart to adjust to new blood-flow patterns. It took seven eight-hour procedures, over the course of more than a year, to complete treatment, and Shawn’s road to recovery was not an easy one. He developed blood clots in his brain on two separate occasions, had one grand mal seizure, and now needs to receive twice-daily injections of a blood thinner. Amazingly, he has suffered no significant neurological deficits, his sleep apnea has completely resolved, he has better balance, is performing wonderfully in school, and no longer suffers from headaches. His genetics workup also showed that he suffers from PTEN Hamartoma Tumor Syndrome, which will require him to have continual yearly monitoring for other medical problems.

“Shawn’s recovery has been extraordinary,” says Dr. Berenstein. “Time will tell, but I expect this to be a permanent fix and I think he’ll continue to do very well.” Shawn’s mom echoed his assessment, and is grateful, she says, to Dr. Berenstein and his “phenomenal” team of doctors and nurses who cared for Shawn throughout his journey.

Dr. Alejandro Berenstein receives financial compensation as a consultant for MicroVention, the manufacturer of the Precipitating Hydrophobic Injectable Liquid System (PHIL).
How Viruses May Play a Role in Alzheimer’s Disease

How Viruses May Play a Role in Alzheimer’s Disease (continued from page 1)

out the networks in which these viruses are operating and influencing known Alzheimer’s genes.”

The study was enabled in part by powerful new molecular profiling data released by the National Institute on Aging (NIA) Accelerating Medicines Partnership-Alzheimer’s Disease, a collaboration among industry, government, and nonprofit organizations dedicated to identifying new targets for preventing or treating the disease. Using those data, the team conducted computer mapping of four brain regions from more than 600 samples from the Mount Sinai Brain Bank, which for the last 56 years has been examining postmortem brain tissue from donors for Alzheimer’s-related research.

As the study progressed, the team found the higher levels of HHV-6A and HHV-7 viruses, which was subsequently confirmed using data from brain banks in three other major NIA Alzheimer’s Centers. Researchers also discovered that the viruses appeared to accelerate the development of Alzheimer’s-related plaques and tangles in the brain.

“Our team was initially quite skeptical about these findings,” says the study co-senior author, Sam Gandy, MD, PhD, Mount Sinai Professor in Alzheimer’s Research and the Director of the Center for Cognitive Health and NFL Neurological Care at Mount Sinai. “Gradually, we became convinced that what we were seeing is a real property of Alzheimer’s brains in several internationally recognized brain banks, and that we ought to report it, even if we cannot completely explain what these viruses are doing in the brain.”

Although the study does not prove a direct causal role between these herpesviruses and Alzheimer’s disease, or indicate what activates the viruses, the findings do lend credence to the hypothesis that these herpesviruses may trigger progression of dementia in Alzheimer’s. This work also opens new avenues for the identification of subpopulations and biomarkers, which would not only make it easier to diagnose and determine a person’s risk of developing Alzheimer’s but also possibly create opportunities to use existing antiviral drugs and drugs that stop the brain’s immune cells from responding to these viruses.

“We have been inundated with letters and emails from people sharing stories about viral infection and Alzheimer’s disease in their personal or family life, and that is an impetus for us to find an effective therapy as soon as we can,” Dr. Dudley says.
Around the Health System

Beth Oliver, DNP, Heart Health Leader

The American Heart Association (AHA) New York City recently named Beth Oliver, DNP, Senior Vice President of Cardiac Services, Mount Sinai Health System, as its new President of the Board of Directors. Ms. Oliver is the first nurse to hold the position and is the only nurse to have been a member of the organization’s Board of Directors, which she joined in 2006. Since then, Ms. Oliver has been involved with multiple initiatives that champion heart health, including the Wall Street Run & Heart Walk.

Additionally, Ms. Oliver was the first nurse in New York City to receive the Heart and Stroke Lifesaver Award from the AHA for outstanding support of the organization’s mission to build lives free of cardiovascular diseases and stroke. “I am passionate about helping the AHA continue to raise awareness about heart health and tackle health disparities in the city,” she says.

Mount Sinai Hosts Diversity Summit

The Mount Sinai Health System recently hosted the National Diversity Council’s inaugural Tri-State Health Care Diversity Summit at the Corporate Services Center, bringing together nearly 100 health care administrators and diversity and inclusion professionals from across the region. The Council, a nonprofit organization that advances inclusiveness in the private, public, and nonprofit sectors, presented the Health System with an Excellence Award for its deep commitment to diversity and inclusion in the workplace and surrounding communities. Showing respect and understanding for people of all backgrounds improves patient satisfaction—benefitting both patients’ well-being and a medical institution’s bottom line, panelists said. “This inaugural event provided a valuable forum for sharing and learning,” says Mary Koshy, MPA, Associate Director, Office for Diversity and Inclusion, Mount Sinai Health System. “The Council received such positive feedback that we were asked to host the event again next year.”

In Support of Individuals With Disability

Dozens of Mount Sinai Health System employees, patients, and volunteers participated in the fourth annual Disability Pride Parade NYC on Sunday, July 15. Wearing cobalt blue and magenta capes emblazoned with the word “superhero,” the group carried a Mount Sinai Rehabilitation Center banner along the nine-block parade route, which extended from Madison Square Park to Union Square Park.

The Disability Pride Parade NYC was launched in 2015 by jazz musician Mike LeDonne in honor of his daughter, Mary, who was born with Prader-Willi syndrome, a genetic disorder that impairs development. Each year, the parade celebrates inclusivity and supports individuals with disabilities.

Summertime Luau at The Mount Sinai Hospital

The Plaza Café at The Mount Sinai Hospital was transformed into a colorful luau on Tuesday, July 24, courtesy of Food Services. As Hawaiian music played, employees snapped pictures at a photo booth and dined on chicken and shrimp kabobs, coconut chicken, chocolate lava cake, cinnamon doughnuts decorated with paper pineapple leaves, and an assortment of tropical smoothies.

Left, Michele Steinberg, Food Services marketing intern and event organizer, and Valerie Shirley, Regional Marketing and Retail Director for the food vendor Morrison Healthcare.
Save the Date!
SINAInnovations
Icahn School of Medicine at Mount Sinai

7th Annual SINAInnovations
Theme: Innovation in Science and Medicine
As the Icahn School of Medicine at Mount Sinai celebrates its 50th anniversary, this year’s SINAInnovations conference will focus on the school’s historical achievements, current strengths, and plans for continued leadership in biomedicine through interdisciplinary collaboration, innovation, and discovery.

Tuesday, October 23 – Wednesday, October 24
Annenberg, Stern Auditorium
Email: Sinainnovations@mssm.edu
http://icahn.mssm.edu/about/sinainnovations
Registration is free but required.

3rd Annual Mount Sinai Health Hackathon
Creating Novel Technology Solutions for Health Care
Theme: Rare Diseases
A 48-hour fun and high-energy, team-based, multidisciplinary competition focused on creating novel technology solutions for problems in health care.

Free: Pre-Hackathon Workshops
Learn about this year’s theme, discover ideas for projects, and sharpen your technical skills.

Needs Finding Workshop
Thursday, September 20
6 – 9:30 pm
Prototyping Workshop
Saturday, September 22
10 am – 6 pm
Kickstart Workshop
Thursday, October 4
6 – 9 pm

Center for Innovation and Discovery
Annenberg, Fifth Floor
For more information, email health-hackathon@mssm.edu. To register, visit http://bit.ly/SinaiHealthHackathon.

TeamCindy 5k Run for Research
Join the Department of Neurosurgery and TeamCindy, a fundraising arm of the Brain Aneurysm Foundation, at the Fifth Annual Run for Research. To contribute or to join Team Mount Sinai, visit http://bit.ly/TeamCindy2018.

Saturday, September 15
9 am – noon
Riverside Drive and 103rd Street
Registration is $40 for adults and $20 for children 12 and under.

September Is Gynecologic Cancers Awareness Month
All are invited to learn more about gynecologic cancers, risk factors, screening, nutrition, stress-reducing behaviors, and more, in an educational fair sponsored by Women and Children’s Services and the Department of Social Work Services at The Mount Sinai Hospital.

Monday, September 17
11 am – 3 pm
Guggenheim Pavilion

22nd Annual Seaver Autism Center Advances in Autism Conference
Mount Sinai’s Seaver Autism Center for Research and Treatment brings together academic experts in the field of autism, parents, and community groups at its annual Advances in Autism Conference. Scientific and clinical research leaders will provide an overview of precision medicine approaches that stratify individuals with autism into biological subgroups for optimal treatments, focusing on genetics and neurophysiology. Advances in several rare genetic disorders related to autism will also be discussed. Keynote speaker Monica Coenraads, Founder and Executive Director of the Rett Syndrome Research Trust, will present “Rett Syndrome: Roadmap to a Cure.” For more information and to register, please visit http://bit.ly/AnnualConference2018.

Thursday, October 4
9:30 am – 3:30 pm
New York Academy of Medicine
1216 Fifth Avenue