

Yale School of Medicine prepares to welcome its 19th dean

Yale College alumna Nancy Brown has been chair of medicine at Vanderbilt

Nancy J. Brown, MD, has been appointed the next dean of Yale School of Medicine (YSM), effective February 1, 2020.

Brown, who is in line to be the 19th dean of the medical school and first woman to hold the post, joins Yale from Vanderbilt University School of Medicine, where she is Hugh J. Morgan Professor and chair of the Department of Medicine. A 1981 alumna of Yale College, where she majored in molecular biophysics and biochemistry, Brown earned her medical degree at Harvard University. After completing her residency in internal

medicine and fellowship in clinical pharmacology at Vanderbilt, she joined the faculty there in 1992.

The path to leadership that Brown followed at Vanderbilt reflects her passions for pursuing research and nurturing the next generation of physician-scientists. She was chief of the Division of Clinical Pharmacology, which is part of both a basic science department (pharmacology) and a clinical department (medicine).

She served as associate dean for clinical and translational scientist development, establishing the Elliot Newman Society to support the development of physician-scientists, before becoming chair of medicine in 2010. She also co-founded the Vanderbilt Master of Science in Clinical Investigation program to train investigators in patient-oriented research.



Under her stewardship, Vanderbilt's Department of Medicine, which today has more than 900 faculty members and // **Dean** (page 11)

Nancy Brown takes office as dean on February 1. Her early priorities include improving the work climate at the School of Medicine, exploring new opportunities to develop physician-scientists, and supporting Yale's strategic plan for science.

Gift launches Yale autoimmunity center

The Colton Center's mission is to identify and nurture research leading to cures

What do type 1 diabetes, rheumatoid arthritis, systemic lupus erythematosus (SLE), multiple sclerosis, inflammatory bowel disease, and celiac disease have in common? As different as they are in clinical presentation, they share an important characteristic. Each is an autoimmune disease.

More than 80 different autoimmune diseases occur as a result of the immune system attacking the body's own organs, tissues, and cells, causing inflammation and cell death. Some 23.5 million individuals are affected in the U.S., and the diseases' prevalence continues to rise. Scientists lack a clear understanding of the causes of autoimmune disorders, limiting their ability to develop safe, effective treatments and preventives.

With a keen interest in autoimmune disease and a shared vision of finding new therapies,



Joseph Craft is the inaugural director of the Colton Center for Autoimmunity at Yale, established through a gift from philanthropists Judith and Stewart Colton. Diseases that affect some 23.5 million Americans are the focus of the center, which will nurture innovative research with a goal of finding safe, effective treatments and preventives.

philanthropists Judith and Stewart Colton have donated a major gift to establish the Colton Center for Autoimmunity at Yale. Under the direction of Joseph E. Craft, MD,

Paul B. Beeson Professor of Medicine and professor of immunobiology, the center will focus on nurturing the development of new diagnostics, therapies, // **Autoimmune** (page 10)

A new pathology chair is named, will arrive in March



Chen Liu

Chen Liu, MD, PhD, will become chair of the Department of Pathology at Yale School of Medicine and chief of Pathology at Yale New Haven Hospital, effective March 1, 2020.

Liu comes to Yale from Rutgers University, where since 2015 he has been professor and chair of pathology, immunology, and laboratory medicine at New Jersey Medical School and Robert Wood Johnson (RWJ) Medical School and chair of the Center for Dermatology at RWJ Medical School. He is also chief of service at University Hospital in Newark and RWJ University Hospital in New Brunswick and chief of the Division of Oncological Pathology at the Rutgers Cancer Institute of New Jersey.

After obtaining his medical degree at Tong Liao Medical College at Inner Mongolia // **Chair** (page 5)

Medicine@Yale

1 Church St., Suite 300, New Haven, CT 06510-3330
www.medicineat Yale.org

Non-Profit Org.
U.S. Postage

PAID

New Haven, CT
Permit No. 526

INSIDE THIS ISSUE

2 Lifelines

Karen Santucci, MD, believes emergency department care can change the trajectories of young lives, and has made it her calling.

3 Putting genomics to novel uses

The medical school and Yale New Haven Health have launched Generations, an ambitious DNA sequencing project.

11 The value of palliative care

Jennifer Kapo, MD, becomes the first holder of an endowed professorship that honors palliative care and her practice of it.

FOLLOW & SHARE

twitter.com/YaleMed

facebook.com/YaleMed

instagram.com/YaleMed



Karen Santucci

Karen Santucci has been a caring clinician at times when her patients may need her most. Hers is the first face many see when they arrive at Yale New Haven Health pediatric emergency departments in New Haven and Greenwich. She also has been a leading administrator at the School of Medicine and the health system.

ROBERT A. LISAK

Care when a child has a sudden need

A career of treating young patients and seeing that emergency rooms run well

Karen Santucci, MD, professor of pediatrics (emergency medicine) and of emergency medicine, usually has two things in her purse: dollar store items, and snacks. Both carry important significance to her work in the pediatric department at Yale New Haven Children's Hospital, where she performs several roles including section chief of emergency medicine and interim section chief of pediatric oncology and hematology. She also is vice chair for clinical affairs in the Department of Pediatrics at the School of Medicine.

The snacks she keeps with her are for meetings or shifts in the emergency department, to keep everyone energized. The dollar store items she uses as props and prizes during her Friday rounds, which she calls TGIFF—Team Gathering Innovation, Information, Facts, and Fun. Providing for her team and her patients is a cornerstone of Santucci's professional career.

Born near New York City, Santucci was the first in her family to go to college and the first to pursue medicine. She credits watching her firefighter father as early exposure to the world of emergency care.

Santucci received her BS in biology from the College of Mount Saint Vincent. But she almost did not go to medical school—her college advisor urged her not to apply, saying that she wouldn't get in. She accepted a teaching fellowship at New York University instead. Halfway through the year she realized that medicine still called to her, and decided to apply to New York-based medical schools. She was accepted to the State University of New York Downstate College of Medicine, where she also completed her residency before moving to Providence, Rhode Island, to complete a fellowship at Hasbro Children's Hospital.

Santucci always had an interest in pediatrics, but ultimately chose pediatric emergency medicine because she knew that was the only way she could leave some of her work "at the office."

"I knew I had to control when I had patient exposure because I get very invested in them," she says. "Having trusted colleagues to whom I can pass the baton at the end of a shift was a way to have everything in the hospital, but have a family too."

Santucci came to Yale in 1999. That same year she helped design and launch a pediatric emergency medicine fellowship program, which now receives more than 100 applicants a year for two available positions. And that was just the beginning of her influence in the department.

Santucci has been section chief of pediatric emergency medicine since 2010, and until recently served as medical director of emergency pediatrics, before transitioning to vice chair of clinical affairs. Two and a half years ago she was also asked to start a pediatric emergency medicine program at Greenwich Hospital, which is part of Yale New Haven Health. It went live in November 2018. Santucci is supported by 12 pediatric emergency physicians from Yale New Haven Children's Hospital, and says the program is performing extremely well.

"Watching other community hospitals, we recognized over the years that strength in recruiting and retention correlates with having the academic affiliation with Yale," she says. "It's really a landmark event to have 13 of us from Yale working at Greenwich and representing Yale School of Medicine and Yale New Haven Children's Hospital."

Santucci's efforts in Greenwich were recognized this past May, when she was honored at Greenwich Hospital's annual Under the Stars event. But in keeping with her low-key style, she credits most

of her success—and the emergency department's achievements—to her colleagues. "I work with absolute giants," she says. "They're amazing people, and I would do just about anything for them."

The same goes for her patients. Pediatric emergency medicine presents its own special sets of challenges, she says, due to how young incoming patients are and, oftentimes, their fear of doctors. The right knee of Santucci's scrubs is often worn thin from the amount of time she spends kneeling next to beds, comforting both patients and their families. But she also finds treating children to be a more hopeful endeavor than treating some adults.

"One of the beautiful things about pediatric emergency medicine is that we're getting to these children early enough that we might actually be able to change a trajectory," she says. "There's a very different illness set on the adult side."

When she is not in the emergency department, Santucci is running between her offices, juggling her administrative roles. It has been a little tricky, she admits, since she now spends half her time in Greenwich. She is putting in 80-90 hour weeks.

Luckily her family, including her husband and two children aged 23 and 18, are very understanding. "My kids are very supportive of the fact that when I'm not able to be at home, it's because I'm off taking care of someone else's child who needs help," she says.

So far, her two hospital schedules have rarely conflicted, save one evening when Santucci was called by the emergency department at Greenwich when she was on shift at Yale New Haven Children's Hospital. When she finally arrived in Greenwich, a bit flustered but only a few minutes late, she says the staff there had only one question for her: "Does this mean you didn't bring snacks?"

University opens state-of-the-art science building



Anna Marie Pyle

On October 29, the University dedicated the new Yale Science Building (YSB) on the footprint of the former J.W. Gibbs Laboratory.

YSB, which will serve as a central hub for interdisciplinary collaboration on Science Hill, is designed to bring natural light into lab spaces, and contains common areas intended to bring researchers together as they walk through the building. Its approximately 550 occupants include members of the departments of molecular, cellular, and developmental biology; and of molecular biophysics and biochemistry.

It includes a cryo-electron microscopy facility as well as life-microscopy, chemical-synthesis, and insectary and aquatics cores; a quantitative biology center, and physics laboratories.

"This building is completely unique among modern science buildings because of the breadth of scientific endeavor that it is designed to accommodate," said Anna Marie Pyle, PhD, Sterling Professor of Molecular, Cellular, and Developmental Biology, and chair of the YSB Building Committee. "Most important, when the future inevitably comes, the labs inside YSB can be completely dismantled to do new kinds of science that we don't even envision today."

"In 100 years, when people look back to this moment, they will see that this was when we put a stake in the ground for our aspirations in research and education," added President Peter Salovey, PhD '86.

Medicine@Yale

Managing Editor Robert Forman

Contributors Jenny Blair, Riley Davis, Pamela Hartley, Bill Hathaway, Ziba Kashef, Mary Ann Littell, Jill Max, Karen N. Peart, Kathleen Frey Raven, Jim Shelton, Ashley P. Taylor, Kevin Wang, William Weir, and Sarah C.P. Williams

Design Jennifer Stockwell

Web Coordinator/Proofreader Cheryl Violante

Medicine@Yale is published four times each year by: Yale School of Medicine, Office of Communications 1 Church Street, Suite 300, New Haven, CT 06510-3330 Telephone: (203) 785-5824 Fax: (203) 785-4327

Email medicine@yale.edu

Website medicineatyale.org

Copyright ©2019 by Yale University. All rights reserved.

If you have a change of address or do not wish to receive future issues of *Medicine@Yale*, please write to us at the above address or via email at medicine@yale.edu.

Postal permit held by Yale University, 155 Whitney Avenue, New Haven, CT 06520

Yale SCHOOL OF MEDICINE

Robert J. Alpern, MD
Dean and Ensign Professor of Medicine

Roopashree Narasimhaiah
Associate Vice President for Development & Alumni Affairs (203) 436-8504

Mary Hu
Associate Dean for Communications and Chief Communications Officer



Printed on recycled paper ♻️

Billingsley is named Smilow Cancer Hospital's chief medical officer

Kevin G. Billingsley, MD, has been named chief medical officer at Smilow Cancer Hospital and professor of surgery at Yale School of Medicine, effective January 2020.

Billingsley comes to Yale from Oregon Health and Sciences University (OHSU), where he has been medical director of the OHSU



Kevin Billingsley

Knight Cancer Institute among other senior positions.

At Smilow and Yale New Haven Health, he will oversee quality and patient-safety initiatives, evaluate

and optimize multidisciplinary team structure, assist with facilities/space planning, and support the research mission.

Billingsley earned his medical degree at Johns Hopkins School of Medicine and trained in surgical oncology at Memorial Sloan Kettering Cancer Center.

Headway is made on averting renal cysts



Yale researchers have discovered how the polycystin 2 (PC2) gene alters the energy status of cells when PC2 is mutated to cause autosomal dominant polycystic kidney disease (ADPKD), an inherited condition with no cure.

Barbara Ehrlich, PhD, professor of pharmacology and of cellular and molecular physiology, and colleagues used high resolution microscopy as well as animal models to study the impact of PC2 mutations on mitochondria, which generate cellular energy.

They discovered that PC2 normally acts to limit the physical interactions between the mitochondria and endoplasmic reticulum (ER)—another cellular organelle where proteins are produced and modified. When PC2 is mutated, the team reported May 7 in *Science Signaling*, interactions between the ER and mitochondria increase.

This leads to more signaling on the surface of the mitochondria, more energy production, more mitochondria, and—in response to the increased energy—proliferation of kidney cells to form harmful cysts. Blocking the excess energy production in mitochondria, Ehrlich and her colleagues found, stopped the production of new cells in cysts.

New clues to heart muscle thickening

Hypertrophic cardiomyopathy (HCM), in which the heart muscle grows too thick and contracts too hard, is often caused by mutations in the cardiac form of the muscle protein myosin. But Stuart Campbell, PhD, associate professor of biomedical engineering and of cellular and molecular physiology, suspected that changes to the extracellular matrix (ECM), the scaffolding that supports cells, might contribute to HCM.

To test that hypothesis, Campbell and his team took diseased heart muscle from pigs that serve as animal models of HCM, chemically removed the cells, and seeded the decellularized and diseased matrix—as well as a control matrix from healthy pigs—with healthy human heart cells generated in cell culture.

As Campbell and his team reported July 24 in *JACC: Basic to Translational Science*, the diseased matrix was stiffer than its healthy counterpart, and the tissue that resulted from the seeding of healthy cells onto diseased matrix exhibited the contractile defects of HCM.

The stiff diseased matrix may have triggered the hypercontractility in the healthy heart cells, the authors suggest. Future work will investigate how the ECM affects contractility, Campbell says.

DNA sequencing to guide research, care

Program anticipates participation by many patients who can learn their own cancer and heart risks and help uncover broader trends

At a ceremony at Yale Center for Clinical Investigation on September 4, Yale School of Medicine and Yale New Haven Health System officially launched Generations, one of the largest DNA sequencing projects of its kind in the United States. The aim is to enroll more than 100,000 patients in and near Connecticut, whose DNA will then be analyzed by Yale scientists to develop useful data for predicting, preventing, and treating what may eventually be hundreds of gene-related conditions.

Its architects envision Generations as a benefit to both the clinic and the laboratory. Its most immediate application may be for the actual volunteers who donate blood samples for analysis. If their genetic information suggests elevated risk for specific conditions related to cardiac disease or cancer—conditions that are considered “actionable” by the medical community—health professionals at Generations will inform them. “What we can do right now is we can give back to 2% to 3% of people information that they wouldn’t otherwise know about serious life-threatening risks that they can do something about. That’s revolutionary,” says Michael F. Murray, MD, professor of genetics and director of clinical operations for Yale’s Center for Genomic Health, who is in charge of Generations.

Murray was recruited to Yale after building a similar program at Geisinger Health System in Danville, Pennsylvania. He says genomic information collected there indicating elevated breast cancer risk was revealing. “We have very clear examples of some patients who had cancer detected at a very early stage, and cured, and will never have to suffer with the disease. That’s life changing for them.”

Changing the lives of people with conditions unrelated to cancer or heart disease will take longer. For instance, since effective therapies do not yet exist for Alzheimer’s, volunteer donors will get no information on their risk for that. “We can’t currently intervene on Alzheimer’s,” says Murray. “There is no treatment or prevention for it.” Generations will only inform volunteer donors of their genetic risk when research makes a condition treatable. For this year’s donors, that could mean being notified years from now. “There are 20,000 genes,” says Murray. We’re giving back information on between 10 and 100 genes. That leaves more than 99% that we’re not attending to because we don’t know what to do yet about conditions they might cause.”

Murray says Yale’s location will produce a scientifically meaningful cohort of participants. “Connecticut is the fourth closest match to the U.S. population in the census data for ethnicity and race,” he notes. “This is a great place to pilot genomic medicine.” That, he says, will allow Generations to make great strides in a field where existing data tend to be skewed. “The datasets are very biased toward Europeans. We know that could mean missed opportunities when you try to apply that information to somebody from a different part of the world.”

As patterns related to specific diseases and demographic groups are found, Yale practitioners will then put their findings into practice for patients of Yale Medicine and the Yale New Haven Health System. “We learn from every patient whom we treat within the health center,” says Brian R. Smith, MD, professor and chair of laboratory medicine, deputy dean for scientific affairs, co-director of the Yale Center for Clinical Investigation, and co-principal investigator of the Yale Clinical and Translational Science Award Program. “As a consequence of that, we do a better job with the next patient we treat, and on and on.”

One exciting thing to learn will be why certain people who carry a disease-causing gene mutation do not become ill. “I think a big question is why some people with the same mutation get a disease and others don’t,” says Antonio Giraldez, PhD, chair and Fergus F. Wallace Professor of Genetics, who says evaluating healthy people will be as important as analyzing those who have symptoms. “If you only study the people who have the disease, you cannot discover what protects you.”

Clinical trials and other patient studies will also be more efficient to construct because potential participants are already in the database.

Daniel L. Jacoby, MD, associate professor of internal medicine (cardiovascular medicine) and director of the

comprehensive heart failure and cardiomyopathy programs, treats patients with cardiac amyloidosis, which occurs when deposits of an abnormal protein called amyloid take the place of normal heart muscle and affect heart function. Jacoby, Edward J. Miller, MD, PhD, associate professor of medicine and radiology, and Nikolaus Papoutsidakis MD, PhD, instructor of medicine (cardiology), are also investigating how the condition progresses. They anticipate that data from Generations will be a foundation for that work.

Jacoby notes that the condition, which disproportionately affects African Americans, is often misdiagnosed as hypertensive heart disease and treated as such. “The usual medications that are used to treat heart failure don’t actually work in cardiac amyloidosis,” he says. “Beta blockers and ACE inhibitors can make things worse.”

Jacoby expects the Generations information to be life-enhancing, by minimizing misdiagnoses and symptoms that go untreated while steering treatment in the right direction. “If you’re 25 years old and you go into the Generations Project and you find out you have the associated mutation, a couple of



At the official launch of Generations on September 4, (l-r): Richard Lisitano and Marna Borgstrom of Yale New Haven Health (YNHH), Dean Robert Alpern, Keith Churchwell of YNHH, Michael Murray, and Brian Smith. Generations is one of the largest DNA sequencing projects of its kind in the United States and hopes to enroll more than 100,000 volunteer participants.

things are going to happen. One is you’re going to know, and we’ll keep close tabs. If something starts to come up, we can begin treatment right away. Second, there’s a fair chance that one of your parents will have the gene, and, in fact, have some clinical problems related to it that they may not previously have been aware of. And they’ll be able to get treatment.”

“I think genetic discovery within the next five to 10 years will become as routine as a blood test at birth” Giraldez says. He predicts that childhood maladies could also become a prime focus. “That might be ADHD, autism, or other genetic conditions, which present more suddenly and can have irreversible effects if not treated promptly. It is hard for a family to learn that, but it’s also hard when you have to jump from doctor to doctor for a diagnosis or when some kids might not be easily diagnosed.”

Genomic analysis may also help clinicians customize medication regimens. Rebecca Pulk, PharmD, clinical coordinator for pharmacogenomics at Yale New Haven Health, looks forward to providing actionable results that can improve care. “Genes linked to metabolic and transporter pathways have known population based variations that affect medications,” she explains. “An example finding would be the *DPYD* gene which codes for the enzyme dihydropyrimidine dehydrogenase. Fluorouracil, a chemotherapy used in GI and breast malignancies, relies entirely on this enzyme for clearance. Patients receiving fluorouracil who genetically do not produce functional versions of this enzyme are at risk of life-threatening bone marrow toxicity. Through identification of those at risk for toxicity, lower doses or alternative treatments can be used.”

Generations builds on a heritage of genetics-related firsts at Yale School of Medicine. Robert J. Alpern, MD, dean and Ensign Professor of Medicine, notes that “Yale actually had the foresight decades and decades ago to form the first department of genetics in the country.” Now, he says, “we have the ability to tie it all together, and really participate in what is going to be a revolution in health care, and we’re really looking forward to being a part of it.”

In the words of Antonio Giraldez, who led the recruitment of Michael Murray to Yale, “When we look back at this in 10 or 20 years, it will have been transformative.”

OUT & ABOUT

May 6 At a launch event for **Elevate**, a new policy laboratory housed in the Yale Child Study Center in collaboration with Women's Health Research at Yale, **Chelsea Clinton**, vice chair of the Clinton Foundation, participated in a panel discussion with **Megan Smith**, DrPH, (left), associate professor of psychiatry and in the Yale Child Study Center; and **Kelvin Chan**, PhD, (right), director of the Robin Hood Foundation's Fund for Early Learning.



HAROLD SHAPIRO

May 8 Professor emeritus and former deputy dean **Robert H. Gifford**, MD, (left), traveled to Fort Myers and Wellington, Fla., for **Gatherings with Alumni**. Among those present was **Ellis Webster**, MD '91, an otolaryngologist in Loxahatchee. Gifford made an appeal for alumni support for financial aid to help move the medical school closer to its ambitious goal of eliminating all need-based student loans and replacing them with scholarships.



MICHAEL FITZSOUSA



May 20 Yale School of Medicine's **Commencement** keynote speaker, former U.S. Surgeon General **Vivek Murthy**, MD '03, MBA '03, urged graduates to nurture deep interpersonal connections to counterbalance an "epidemic" of loneliness and isolation in society, especially among physicians. **1.** From left, Murthy; **Robert J. Alpern**, MD, dean and Ensign Professor of Medicine; and Class of 2019 graduate **Michael Boyle**, MD. **2.** More Class of 2019 graduates sharing infectious smiles, from left, **Raysa Cabrejo**, MD; **Herbert Castillo Valladares**, MD; and **Lawrence Chan**, MD.



ANTHONY DECARLO (2)



HAROLD SHAPIRO (3)

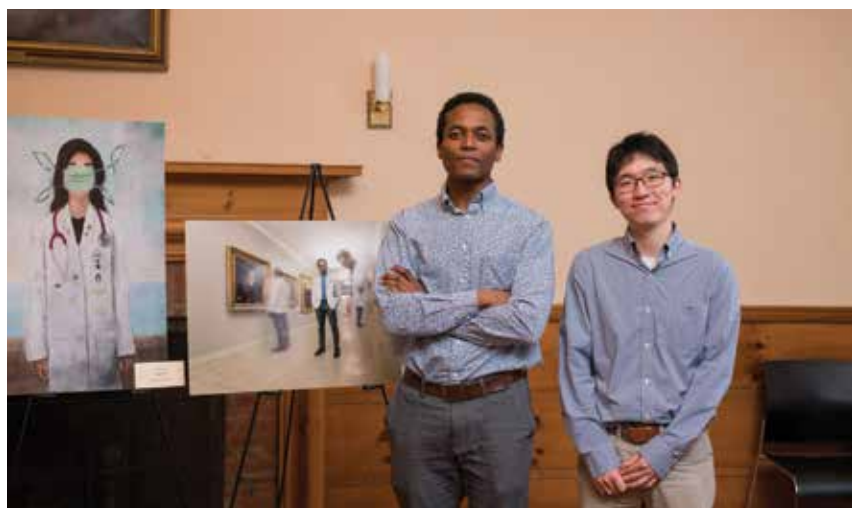
May 31—June 1 Alumni returned to campus for **Reunion**, which featured the dean's State of the School address, awards, and presentations from students and faculty. **1.** Members of the Class of 1999 caught up with each other over an alfresco dinner. **2.** **John Kirk**, MD '94 (right), and **Cynthia Parenteau**, channeled some Yale spirit with pompoms and a cardboard cutout of Handsome Dan. **3.** A panel of alumni shared their experiences in personal career advancement.



ANTHONY DECARLO

June 6 The **Iva Dostanic, MD, PhD, Physician-Scientist Trainee Award**, given in memory of its exceptionally talented namesake who was a trainee at the medical school, was awarded to **Shelli Farhadian**, MD, PhD, assistant professor of medicine (infectious diseases). The honor for Farhadian included presenting

at the Department of Internal Medicine's Medical Grand Rounds. From left, **Pre-drag** and **Dragana Dostanic**, parents of Iva; Farhadian; **Vincent Quagliarello**, MD, professor of medicine (infectious diseases) and clinical chief of infectious diseases, and **Peter S. Aronson**, MD, C.N.H. Long Professor of Medicine (nephrology) and of cellular and molecular physiology.



ANTHONY DECARLO

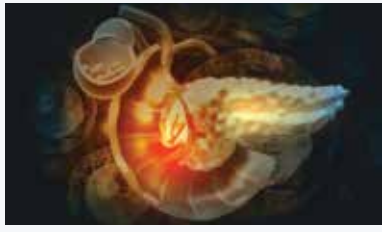
May 23 At the **Marguerite Rush Lerner Creative Writing and Art Contest**, sponsored by the Program for Humanities in Medicine, medical students submitted a total of 85 submissions of poetry, prose, and visual art. **Natnael (Natty) Doilicho** (left), and **David Nam**, both Class of 2022, pose with **Waypoint**, a photograph they arranged together.



ANTHONY DECARLO

July 31 At the **Carl Fellowship Conference**, students and teachers from Native American tribes visited the Yale Child Study Center as fellows during a two-week education immersion program that supports child development and mental health in Native American communities. The fellows were supported by the Charles W. Carl Jr., MD Training Fellowship Fund. From left, **Mark Beitel**, PhD, assistant clinical professor of psychiatry; **Charles W. Carl, Jr.**, MD '63, a psychiatrist in private practice in Massachusetts, who started the fund; **Christopher Cutter**, PhD, assistant professor in the Child Study Center; and **Jordan Barlow**, a grant writer for the Modoc tribe.

A new approach to insulin regulation



When blood sugar rises, beta cells in the pancreas release insulin, causing cells to take in more glucose and keeping blood sugar levels steady. Problems with this feedback mechanism can result in such metabolic disorders as diabetes and hypoglycemia.

Scientists already knew that ATP, cellular fuel produced through glucose breakdown, triggers insulin release, and since the oxidative phosphorylation step (OxPhos) in glucose metabolism produces significant ATP, OxPhos was thought to regulate insulin secretion.

However, research led by Richard G. Kibbey, MD, PhD, associate professor of medicine, indicates that another product of glucose metabolism, mitochondrial GTP (mtGTP), does the same thing—independent of OxPhos.

As reported July 16 in *Cell Reports*, when Kibbey's team overexpressed the protein that makes mtGTP in beta cells, insulin levels increased in vitro. In mice overexpressing the mtGTP progenitor protein, insulin levels also rose, and blood sugar levels dropped. mtGTP also appeared to protect beta cells from metabolic stress. Kibbey says these results point to the mtGTP pathway as a promising new target for diabetes drugs.

Drug may have an ovarian cancer role

In a recent clinical trial, combining the rarely used cancer drug cediranib with the more mainstream drug olaparib treated recurrent ovarian cancer better than olaparib alone—a surprising finding. Now, Yale researchers have discovered exactly how cediranib works and why it might be useful in combination with other treatments.

The team, led by Peter M. Glazer, MD, PhD, chair and Robert E. Hunter Professor of Therapeutic Radiology, and professor of genetics, studied the drug using isolated human cancer cells as well as human tumors in mice. They found that cediranib, in addition to its known role in blocking blood vessel formation, also stops a cellular program called homology-directed DNA repair. Tumor cells rely on this program to repair their DNA when it is damaged by such treatments as radiation or chemotherapy.

While other drugs block molecules involved in homology-directed DNA repair, cediranib works at an earlier stage, affecting the expression of genes involved in the process, the researchers reported May 15 in *Science Translational Medicine*.

Combining cediranib with DNA-damaging agents could deliver a double blow to cancer cells, the new results suggest.

A gift funds innovative Lyme research

Instead of targeting the Lyme bacterium, the goal is to block the mechanism of infection

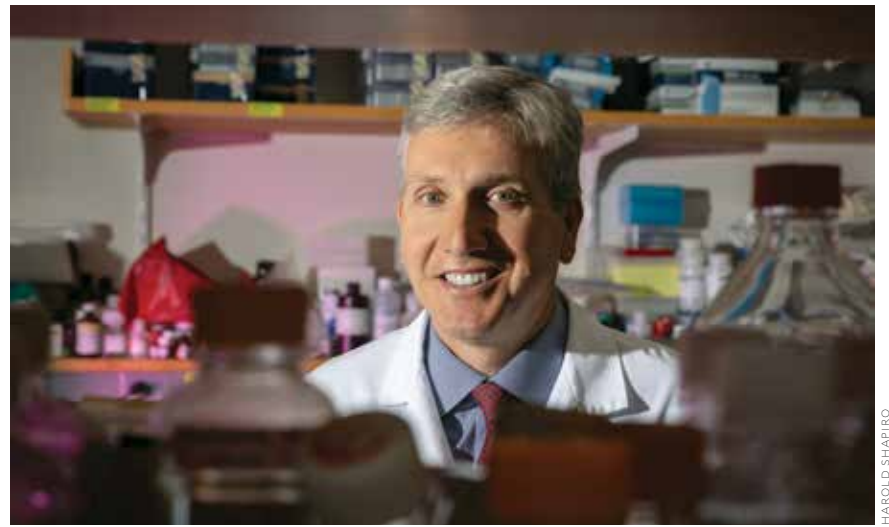
The Steven & Alexandra Cohen Foundation has pledged \$1.8 million over three years to fund Lyme and tickborne disease research by Erol Fikrig, MD, Waldemar Von Zedtwitz Professor of Medicine (Infectious Diseases) and professor of epidemiology (microbial diseases) and of microbial pathogenesis. The gift will fund Fikrig's novel approach to developing an anti-tick vaccine. Instead of trying to target the Lyme disease-causing bacterium, *Borrelia burgdorferi*, as other approaches have, Fikrig plans to target the Ixodes tick that spreads disease, essentially by stymieing the tick's ability to take a blood meal.

"The Steven & Alexandra Cohen Foundation has provided good resources, so we can go at it full steam ahead," says Fikrig, an expert in diseases spread by insects and ticks who also is chief of the Infectious Diseases Section of the Department of Internal Medicine and a Howard Hughes Medical Institute investigator.

"Let's say you're drinking a drink out of a straw, and the straw gets clogged," Fikrig explains. "That's what we're trying to work on—blocking [the tick] from feeding."

When ticks first bite, they inject proteins that prepare a favorable environment for a meal—the event during which various pathogens can be transmitted to the host. These proteins block blood clotting, inflammation, and immune responses. Fikrig's vaccine would prevent them from functioning, encouraging the tick to give up, drop off, and look for another mammal to bite.

Unlike with a mosquito, which can inject pathogens immediately after biting, it takes a tick up to 48 hours after biting before introducing *Borrelia* into the host. That delay gives researchers



HAROLD SHAPIRO

their opening. In studies of guinea pigs, Fikrig's lab has already found that the animals can resist tick bites based on immunity to proteins that the tick produces in the first 24 hours of attachment. Such immunity not only prevents the tick from feeding, but also impairs infection with *Borrelia*.

That discovery lines up with another line of evidence from people living in areas endemic to Lyme disease: Those who have been bitten often by ticks that don't carry *Borrelia* seem to acquire some protection from the parasites over time. "Many will tell you ticks don't bite them as well as they used to," Fikrig says. These people's bodies may be creating antibodies to the ticks' salivary proteins.

Fikrig's lab is currently examining thousands of tick-saliva proteins to find the most promising targets. Once they have cloned 15 to 20, the team will begin testing them in animal models.

"This is an innovative approach to stopping Lyme infection, which remains very difficult both to diagnose accurately and to treat effectively," says Alexandra Cohen, who launched the Cohen Lyme & Tickborne Disease Initiative in 2015. "Lyme is one of the fastest-growing diseases in the United States and is terribly debilitating for far too many people who are infected."

With support from the Steven & Alexandra Cohen Foundation, Erol Fikrig is taking a novel approach to preventing ticks from spreading Lyme disease.

Approximately 300,000 people contract Lyme disease in the U.S. each year, and the numbers are thought to be increasing. Most live in the Northeast and upper Midwest, a distribution likely to expand with climate change. The disease can cause short-term flulike symptoms and rash; over the long term, it can cause facial paralysis; arthritis; inflammation of the heart, brain, or spinal cord; and fatigue, among other problems. Symptoms can persist long after antibiotic treatment. A previous human Lyme vaccine called LYMERix that targeted *Borrelia burgdorferi* sold poorly and was withdrawn from the market in 2002.

Since its inception in 2001, the Stamford, Connecticut-based Steven & Alexandra Cohen Foundation has funded projects in multiple areas, including Lyme and tickborne disease, underserved communities, children's health and education, the arts, and sustainability. Inspired by Alexandra Cohen's personal struggle with Lyme disease, the foundation has committed over \$60 million to more than two dozen projects addressing prevention, diagnosis, treatment, education, and ecology.

// **Chair** (page 1) University of Nationality in China, Liu did postgraduate training at Peking Union Medical College. He went on to receive his PhD in pathology from the University of Pennsylvania School of Medicine. He completed his residency in anatomical and clinical pathology at Hahnemann University Hospital, an oncological pathology fellowship at MD Anderson Cancer Hospital, and postdoctoral training at Scripps Clinic.

Before joining Rutgers, Liu was professor and vice chair of pathology, immunology, and laboratory medicine at the University of Florida, where he also held an endowed chair in gastrointestinal and liver research. In his role as chair at Yale, he will succeed Jon S. Morrow, PhD, MD, chair and Raymond Yesner Professor of Pathology.

Liu is motivated by a desire to bring the most innovative research to medicine. He says he chose to specialize in pathology "because it's really a bridge department. You can do transformational research, bringing discovery to the bedside, and the bedside to

discovery. That's the part that really excited me."

As a well-recognized gastrointestinal and liver pathologist, he provides expert consultations for physicians and patients. He has several patents and pending applications for his research, which focuses on the epigenetic drivers that cause liver cancer in a virally infected or alcohol-exposed liver. This work has contributed to the understanding of liver cancer carcinogenesis and biomarker discovery for early diagnosis and therapeutic targets. He also is using immunotherapy to treat liver cancer, specifically engineering T cells and natural killer (NK) cells to boost their anti-cancer activity, which will soon be tested in a clinical trial. His research programs have been continuously funded by the National Institutes of Health (NIH) and other agencies since 2003.

At Rutgers, Liu led the integration of pathology and dermatology programs, expanded dermatology clinics, and increased the size of the dermatology residency program. He also established the Immunology Division, the Center

for Medical Microbiology, and the Center for the Studies of Stillbirth and Early Infant Death. During the past four years, the department doubled the number of faculty, and significantly increased clinical revenue, NIH funding, and academic productivity.

Liu is a lifetime fellow of the College of American Pathologists and a two-time recipient of the Technology Innovator Award from the University of Florida. He has received awards for teaching and mentoring from the University of Florida, Howard Hughes Medical Institute, and NIH.

At Yale, he plans to continue to pursue innovative research while educating the next generation of investigators and physicians. His goal is to provide exceptional patient-centered care and capture new opportunities in the changing health care landscape. "Yale's Department of Pathology has a great reputation and a group of very distinguished world-class faculty and staff," Liu says. "With that foundation, I think we can further elevate its distinction nationally and internationally."

Grants and contracts awarded to Yale School of Medicine

July 2018–March 2019

Federal

Clara Abraham, NIH, *Functional Outcomes of Inflammatory Bowel Disease Associated Variants*, 4 years, \$2,294,633 • **Fuad Abujarad**, NIH, *Feasibility of Virtual Coaching in making Informed Choices on Elder Mistreatment Self-Disclosure (VOICES)*, 3.6 years, \$1,494,862

Serap Aksoy, NIH, *Molecular Aspects of Tsetse and Trypanosome Transmission*, 5 years, \$4,103,771 • **Christopher Anderson**, NIH, *Human Tissue Engineered Pulsatile Conduits Using Engineered Heart Tissue of Defined Composition and Fiber Orientation*, 3 years, \$133,572 • **Amy Arnsten**, NIH, *Preclinical Assessment of GCP11 Inhibitors for Cognition and Tau Pathology*, 4.8 years, \$3,755,936

Paul Aronson, DHHS, *Development and Pilot Trial of a Web-Based Tool to Facilitate Shared Decision-Making with Parents of Febrile Infants*, 3 years, \$460,170 • **Peter Aronson**, **Lloyd Cantley**, **Joseph Craft**, **Shuta Ishibe**, **Shrikant Mane**, **Dennis Moledina**, **Patricia Preisig**, **Stefan Somlo**, **Francis Wilson**, NIH, *George M. O'Brien Kidney Center at Yale*, 5 years, \$3,982,508 • **Peter Aronson**, NIH, *Roles of SLC26 Transporters in Urinary Oxalate Excretion and Kidney Disease*, 4.8 years, \$2,774,337 • **Craig Bailey**, **Marc Brackett**, Institute of Education Sciences (IES)/U.S. Department of Education, *Promoting School Readiness through Emotional Intelligence: An Efficacy Trial of Preschool RULER*, 5 years, \$3,243,018 • **Stephen Baldassarri**, NIH, *Understanding Factors that Influence Electronic Cigarette Nicotine Delivery Through PET Imaging of Beta-2 Nicotinic Acetylcholine Receptors*, 5 years, \$983,335 • **Daniel Barson**, NIH, *Developmental Participation of VIP Interneurons in Cortical Dynamics*, 2 years, \$58,548 • **Jean-Denis Beaudoin**, NIH, *Analysis of the Molecular Machinery Regulating Gene Expression during Vertebrate Development*, 2 years, \$230,700 • **Amy Bei**, NIH, *Employing Genetic and Genomic Surveillance to Reveal Mechanisms of Malaria Parasite Persistence*, 3 years, \$414,315 • **Chyrell Bellamy**, NIH, *Peer Wellness Enhancement for Patients with Serious Mental Illness and High Medical Costs*, 1.7 years, \$661,500 • **Anton Bennett**, NIH, *Institutional National Research Service Award*, 5 years, \$1,699,865 • **Joerg Bewersdorf**, NIH, *An Integrated Imaging System for High-throughput Nanoscopy of the 4D Nucleome*, 2 years, \$660,001 • **Shivani Bhatt**, NIH, *Investigating the Role of Glucocorticoid Function in PTSD*, 3 years, \$127,068 • **Michael Bond**, NIH, *Development of a Tumor-Specific PROTAC*, 4 years, \$119,276 • **Alfred Bothwell**, NIH, *Thrombocyte Regulation of Anti-Parasite Immunity*, 5 years, \$2,093,750 • **Martina Brueckner**, NIH, *Cilia in Heart Development and Disease*, 7 years, \$5,212,390 • **Gabriela Buccini**, NIH, *Pathways to Scale Up Integrated Early Childhood Development Programs*, 2 years, \$250,818 • **William Cafferty**, NIH, *Temporal Profiling of Corticospinal Motor Neurons Reveals Novel Therapeutic Targets for Spinal Cord Injury*, 2 years, \$460,625 • **Christina Camell**, NIH, *Macrophage Inflammation Activation and the Mechanism of Lipolysis Resistance in Aged Adipose*, 11 months, \$101,499 • **Lloyd Cantley**, **Peter Aronson**, NIH, *Methods in Nephrologic Research*, 5 years, \$2,414,761 • **Richard Carson**, NIH, *A Program for Innovative PET Radioligand Development and Application: A Translational Toolbox for Treatments for Mental Health*, 3 years, \$3,536,103 • **Sreeganga Chandra**, NIH, *Role of Glucosylsphingosine in Parkinson Disease and Dementia with Lewy Bodies*, 4.8 years, \$2,480,685 • **Sandy Chang**, DoD, *Role of BRIT1 in Suppressing Genomic Instability and Triple Negative Breast Carcinogenesis*, 3 years, \$1,256,250 • **Herta Chao**, NIH, *Neurocognitive Changes from Long-Term Androgen Deprivation Therapy in Prostate Cancer Patients*, 5 years, \$1,956,331 • **Marek Chawarski**, NIH, *Implementation of Seek, Test, Treat & Retain Strategies among People Who Inject Drugs in Malaysia*, 4.9 years, \$2,798,783

Sidi Chen, NIH, (PQ4) *Novel Tools For In Vivo Study of Genetic Interactions in Cancer Progression*, 5 years, \$2,865,835; NIH, *High-throughput In Vivo Genetics for Immunotherapy Target Discovery*, 4.9 years, \$2,512,500

Keith Choate, NIH, *Mechanisms of Revertant Mosaicism in Ichthyosis with Confetti*, 5 years, \$2,483,768 • **Hyung Chun**, DoD, *Role of Endothelial Dysfunction as a Key Pathogenic Driver of Hypertrophic Cardiomyopathy*, 1.5 years, \$333,778; NIH, *Role of Endothelial Regulation of Fatty Acid Uptake in Metabolic Dysfunction*, 4 years, \$2,114,240 • **Andrew Cohen**, NIH,

Dementia and Decision-Making for Older Adults without Surrogates, 4.8 years, \$1,178,480 • **Daniel Colón-Ramos**, NIH, *Powering the Brain: The Cell Biology of Neuroenergetics*, 4.8 years, \$5,862,500 • **Elizabeth Connors**, NIH, *Selecting and Testing Implementation Strategies to Advance Measurement-based Care in School Mental Health*, 4 years, \$638,820 • **Joseph Contessa**, NIH, *Regulation of N-linked Glycosylation in Mammalian Cells*, 2 years, \$658,654 • **Philip Corlett**, NIH, *Neurocomputational Mechanisms of Auditory Hallucinations*, 2 years, \$404,250 • **Kelly Cosgrove**, **Sherry McKee**, **Marina Picciotto**, NIH, *Sex-Appropriate Treatment Development for Alcohol Use Disorders*, 1.9 years, \$450,722

Kelly Cosgrove, **Robert Malison**, NIH, *Neuro-immune Disruption in Opioid Use Disorder*, 2 years, \$209,375 • **Chris Cotsapas**, NIH, *Shared Genetics and Risk Factors Between Epilepsy and Psychiatric Disease*, 5 years, \$2,452,828 • **Joseph Craft**, NIH, *Follicular Helper T Cell Function in Autoimmunity*, 4 years, \$1,326,600; NIH, *Pathogenic Lymphocytes in Lupus Nephritis*, 2 years, \$445,978

Larry Davidson, SAMHSA, *Mental Health New England Technology Transfer Center (MH-NETT)*, 5 years, \$4,538,806 • **Maggie Davis**, NIH, *Dysregulation in Mglur5 as a Marker of BPD and Suicide Related Endophenotypes*, 5 years, \$983,483 • **J. Lucian Davis**, NIH, *Human-centered Design and Communities of Practice to Improve Delivery of Home-based TB Contact Investigation in Uganda*, 5 years, \$3,642,351 • **Catherine Deatherage**, NIH, *Reconstitution of Retromer Dependent Cargo Sorting*, 2 years, \$122,784 • **Jonathan Demb**, NIH, *Functional Circuitry of Long-Range Connections in the Retina*, 3.8 years, \$2,012,746

Andrew Dewan, **Suzanne Leal**, NIH, *Detecting Pleiotropic Effects Through Integration of Omics Data*, 4 years, \$2,833,492 • **Sabrina Diano**, NIH, *Intercellular Mechanisms of Microglia Activation in Diet-induced Obesity*, 4.8 years, \$3,385,902 • **Katie Digianantonio**, NIH, *Probing the Mechanism by which TRIM5 Proteins Sense HIV Capsid Assemblies*, 10 months, \$59,038 • **Gail D'Onofrio**, SAMHSA, *The Yale MAT Training Program: Expanding Treatment Access*, 3 years, \$449,746 • **Gail D'Onofrio**, **Patrick O'Connor**, NIH, *Yale Drug Use, Addiction and HIV Research Scholars (DAHRS)*, 5 years, \$2,606,682 • **Vincent Duong**, NIH, *Tenofovir Inhibition of Human Mitochondrial Polymerase Primpol and Mechanisms of Antiviral Therapy-driven Nephrotoxicity*, 3 years, \$93,858 • **Stephanie Eisenbarth**, **James Surprenant**, NIH, *Immune Mechanisms Regulating Allergy*, 5 years, \$3,069,880 • **Irina Esterlis**, NIH, *In Vivo Imaging of a Neural Marker of Suicidal Behavior in Bipolar Disorder*, 5 years, \$3,935,570 • **Guido Falcone**, NIH, *Genetic Analyses of Radiological Severity, Short-Term Functional Outcome and Long-Term Health Status in Spontaneous Intracerebral Hemorrhage*, 5.7 years, \$1,187,214

Shelli Farhadian, NIH, *Understanding the Cellular Basis for Persistent Immune Activation in the Central Nervous System During Virologically Suppressed HIV*, 3.9 years, \$770,281 • **Shawn Ferguson**, NIH, *Axonal Endo-lysosome Transport Mechanisms that Regulate APP Processing*, 4.7 years, \$2,093,750; NIH, *Molecular Mechanisms that Match Lysosome Function to Cellular Demand*, 4.1 years, \$1,373,500 • **Erol Fikrig**, **Albert Shaw**, NIH, *Circadian Rhythms and Innate Immune Response in Aging*, 5 years, \$2,416,813 • **Clare Flannery**, NIH, *Obesity-driven Endometrial Hyperplasia in Postmenopausal Women: Synergistic Role for Insulin and Estrone*, 5 years, \$2,336,929 • **James Freeman**, NIH, *Safety and Effectiveness of Left Atrial Appendage Closure in Atrial Fibrillation (SAFELY-AF)*, 11 months, \$656,551

Charles Fuchs, **Brinda Emu**, **Lisa Fucito**, **Ann Haberman**, **Beth Jones**, **Shrikant Mane**, **Ravinder Nath**, **David Rimm**, **Amer Zeidan**, NIH, *Cancer Center Support Grant*, 5 years, \$23,291,480 • **Charles Fuchs**, NIH, *Yale Cancer Center; NCTN LAPS*, 6 years, \$4,397,760 • **Jorge Galán**, NIH, *Predocortical Training Program in Microbial Pathogenesis*, 5 years, \$1,190,090 • **Gigi Galiana**, NIH, *Distinguishing Lipid Subtypes by Amplifying Contrast from J-Coupling*, 2 years, \$460,625

Patrick Gallagher, **Peter Glazer**, **Mark Saltzman**, NIH, *Nonenzymatic Gene Editing in Treatment of Hereditary Spherocytosis*, 3.8 years, \$2,437,234 • **Joel Gelernter**, NIH,

Genetics of Alcohol Dependence in African Americans: Recruitment, 5 years, \$1,952,611

Wendy Gilbert, NIH, *RNA Pseudouridylation During Flavivirus Infection*, 2 years, \$502,500

Thomas Gill, **Heather Allore**, **Thilinie Bandaranayake**, **Xi Chen**, **Guido Falcone**, **Shelli Farhadian**, **Terrri Fried**, **John Hwa**, **Janice Hwang**, **Manisha Juthani-Mehta**, **Insoo Kang**, **Morgan Levine**, **Becca Levy**, **Brienne Miner**, **Joan Monin**, **Margaret Pisani**, **Vincent Quagliariello**, **Maor Sauler**, **Albert Shaw**, **Hongyu Zhao**, NIH, *Claude D. Pepper Older Americans Independence Center at Yale*, 5 years, \$6,356,005 • **Antonio Giraldez**, NIH, *Functional Analysis of Autism Risk Genes During Neural Development Using Single Cell Seq.*, 4.9 years, \$2,924,347 • **Michael Girardi**, **Marcus Bosenberg**, **David Hafler**, **Ruth Halaban**, **Harriet Kluger**, **Shuangge Ma**, **David Stern**, **Qin Yan**, NIH, *Yale SPOR in Skin Cancer*, 5 years, \$4,824,996 • **Emily Goldberg**, NIH, *Impact of Ketone Bodies on Age-Related Inflammation and Healthspan Extension*, 2 years, \$202,998 • **Elena Gracheva**, NSF, *Molecular Basis of Cold Tolerance*, 1.1 years, \$300,001 • **Daniel Greif**, DoD, *Cell Type-Specific KLF4 Regulation of Lung Fibrosis*, 3 years, \$1,162,741; NIH, *Vascular Disease Pathogenesis: The Interface of Smooth Muscle and Immune Cells*, 4 years, \$2,288,212 • **Daniel Greif**, **Carlos Fernandez-Hernando**, NIH, *Aging and Clonality in Atherosclerosis*, 1.9 years, \$460,625

Carlos Grilo, NIH, *Cognitive-Behavioral and Pharmacologic Treatment of Binge Eating Disorder*, 4.9 years, \$3,572,024 • **Eduardo Groisman**, NIH, *Control of Carbohydrate Utilization in the Prominent Gut Bacterium Bacteroides Thetaiotaomicron*, 3.7 years, \$1,328,478 • **Murat Gunel**, **Angeliki Louvi**, **Ketu Mishra**, NIH, *Functional Validation of Intracranial Aneurysm Risk Genes*, 5 years, \$3,014,549 • **Jiankan Guo**, **Lloyd Cantley**, NIH, *Generation of Macrophage Activation State-Specific Genetic Tools by a Synthetic Biology Approach*, 2 years, \$460,625

Junjie Guo, NIH, *Molecular and Cellular Determinants of RNA Repeat-associated Properties*, 4.7 years, \$2,512,500 • **Romi Gupta**, NIH, *Personalized Therapy for p16-Deficient Melanoma*, 2 years, \$83,750 • **Stephanie Halene**, DoD, *Mechanisms of Bone Marrow Failure and Leukemia Progression in Primary Human Fanconi Anemia Stem Cells in a Novel FA PDX Model*, 2 years, \$662,124 • **Ali Hamodi**, NIH, *Development of Cortical Circuits Using Multi-scale Optical Imaging in Awake Mice*, 3 years, \$190,477 • **Michelle Hampson**, **Ilan Harpaz-Rotem**, NIH, *Neurofeedback of Amygdala Activity for PTSD*, 1.9 years, \$1,154,287

William Hancock-Cerutti, NIH, *Investigating the Lipid Transport Properties of VPS13C at Membrane Contact Sites in Relation to Parkinson's Disease Pathogenesis*, 2 years, \$58,608

Michael Hanna, NIH, *Investigation of ER-endosome Contact Site Dysfunction Underlying Pathomechanism of Hereditary Spastic Paraplegia*, 3 years, \$150,851 • **Nicola Hawley**, NIH, *Development of Samoan-specific Fetal Growth References and an Assessment of Their Diagnostic Ability*, 1.9 years, \$183,324 • **Robert Heimer**, DHHS, *Outcomes from the Continuation of Methadone Treatment for Opioid Use Disorder in the CT Corrections System*, 1 year, \$444,471 • **Kevan Herold**, NIH, *Mechanisms of Autoimmune Diabetes in Patients Treated with Immune Checkpoint Inhibitors*, 2 years, \$251,250 • **Erica Herzog**, DoD, *Cell Type-Specific KLF4 Regulation of Lung Fibrosis*, 3 years, \$1,019,978 • **Ansel Hillmer**, NIH, *Imaging the Opioid Response to Cannabis Smoking*, 1 year, \$251,250 • **Michael Hines**, NIH, *Computer Methods for Physiological Problems*, 3.8 years, \$1,465,624 • **Joy Hirsch**, NIH, *Mechanisms of Dynamic Neural Coupling during Face-to-Face Expressions of Emotion*, 4.8 years, \$2,033,148

Ya-Chi Ho, NIH, *Role of Clonal Expansion in HIV-1 Persistence*, 5 years, \$2,894,524 • **Tamas Horvath**, **Xiao-Bing Gao**, NIH, *Hypocretinergic Control of Cocaine Abuse*, 4.8 years, \$2,416,018

Yingqun Huang, NIH, *H19 Long Noncoding RNA in Hepatic Gluconeogenesis Regulation*, 3 years, \$1,243,776 • **Henry Huang**, NIH, *PET Radiotracers to Image the Enzyme 11beta-hydroxysteroid Dehydrogenase-1 (11beta-HSD1)*, 1.9 years, \$1,631,066 • **Shuta Ishibe**, NIH, *Yale Summer Undergraduate Medical Research (Yale SUMR)*, 5.2 years, \$604,658 • **Yasuko Iwakiri**, DoD, *Hemodynamic Changes and Pancreatitis*, 1.5 years, \$335,000 • **Elizabeth Jonas**, NIH, *Mitochondrial Ion Channels in Hypoxic Neurons*, 3 years, \$1,115,480 • **Elizabeth Jonas**, **Rachel Perry**, NIH, *Regulation of Tumor Growth and Metabolism by Hyperinsulinemia and Inflammation*, 4 years, \$689,305 • **Arie Kaffman**, NIH, *PU.1 as a Putative Master Regulator of Neurodevelopmental Abnormalities of ELS*, 2 years, \$557,556 • **Kristopher Kahle**, NIH, *Modulation of Choroid Plexus Immuno-Secretory Function to Restore Cerebrospinal Fluid Homeostasis in Hydrocephalus*, 4.9 years, \$1,832,030 • **Naftali Kaminski**, NIH, *Normal*

Aging Lung Cell Atlas (NALCA), 4 years, \$2,661,807 • **Naftali Kaminski**, **Ivan Rosas**, NIH, *Epithelial Protective Effects of Thyroid Hormone Signaling in Fibrosis*, 5 years, \$3,227,151 • **Insoo Kang**, NIH, *Aging and IL-7 Mediated CD8+ T Cell Survival*, 4.8 years, \$1,842,500 • **Alanna Kaplan**, NIH, *Tumor-selective Inhibition of DNA Repair using pHLIP*, 3 years, \$108,072 • **Rachel Kaspari**, NIH, *Novel Insights into the Role of the Hypothalamic-Pituitary-Thyroid Axis in Skeletal Muscle Adaptive Thermogenesis*, 2 years, \$72,875 • **Dionna Kasper**, NIH, *Defining miR-223-dependent Mechanisms Regulating Hematopoietic Stem Cell Production from Endothelium*, 2 years, \$205,432 • **Trace Kershaw**, NIH, *Understanding Relapse and the Impact of Social Networks and Geographic Settings During Treatment for Alcohol-Related Problems*, 4.9 years, \$3,485,717

Kenneth Kidd, **Curt Scharfe**, National Institute of Justice, *Better Forensic Markers: Microhaplotypes and Ancestry SNPs*, 1.5 years, \$1,083,499 • **Daniel Kim**, NIH, *Exploring the Innate Sensors Underlying Cancer Immunosurveillance*, 3 years, \$109,608 • **Megan King**, NIH, *Remodeling of the Structure and Function of the Nuclear Lamina by LINC Complex-Dependent Tension*, 4.2 years, \$1,340,000 • **Megan King**, **Simon Mochrrie**, **Corey O'Hern**, NSF, *EFRI CEE: Sculpting the Genome by Design: Epigenetic and Chromatin Looping Inputs to Measure and Manipulate Chromatin Organization and Dynamics*, 5.1 years, \$1,899,968 • **Steven Kleinstein**, NIH, *Computational Tools for the Analysis of High-Throughput Immunoglobulin Sequencing Experiments*, 4 years, \$1,673,023

John Krystal, NIH, *The 4th International Conference on Applications of Neuroimaging to Alcoholism (ICANA-4)*, 1 year, \$25,000 • **Priti Kumar**, NIH, *T Cell-targeted Lentiviral Vectors with Cas9/RNP for the In Vivo Gene Therapy of HIV/AIDS*, 4.9 years, \$3,669,702 • **Priti Kumar**, **Karen Anderson**, NIH, *Long-acting Combination Antiretroviral Therapy for HIV/AIDS*, 2 years, \$598,150 • **Alex Kwan**, NIH, *Frontal Cholinergic Signals During Value-Based Decision-Making*, 1.9 years, \$460,625 • **Themis Kyriakides**, NIH, *Bulk Metallic Glass Nanomoulding for Glucose Sensors*, 3.9 years, \$1,658,091 • **TuKiet Lam**, NIH, *High Resolution Tandem Mass Spectrometer to Meet Growing Demand for Proteomics at Yale*, 1 year, \$572,240 • **Michael Leapman**, NIH, *Understanding the Adoption and Impact of New Risk Assessment Technologies in Prostate Cancer Care*, 4 years, \$1,017,668 • **Eli Lebowitz**, **Dylan Gee**, NIH, *Brain Response Associated with Parent-Based Treatment for Childhood Anxiety Disorders*, 2 years, \$1,516,350 • **Francis Lee**, NIH, *Non-hormonal Function of Locally Delivered PTH for Rescue of Impaired Fracture Healing*, 5 years, \$2,404,806 • **Daeyeol Lee**, **Weiji Ma**, NIH, *CRCNS: Neural Basis of Planning*, 11 months, \$523,874 • **Katie Leiby**, NIH, *Regeneration of Distal Lung Epithelium via Epithelial-Mesenchymal Co-Culture and Modulation of Wnt Signaling*, 3 years, \$106,779

Ifat Levy, NIH, *Decision Making and Learning Under Uncertainty in Aging*, 1.9 years, \$757,408; NSF, *Decision Making Under Uncertainty Across the Lifespan: Cognitive, Motivational and Neural Bases*, 3 years, \$801,045

Chiang-Shan Li, NIH, *A Cholinergic Mechanism of Impulsive Response in Young Adult Cigarette Smokers*, 2 years, \$400,725 • **Zeyan Liew**, NIH, *Neurodevelopmental Effects of Perfluorinated Chemicals*, 2.9 years, \$822,632

Young Lim, NIH, *Exploring the Mechanism of Genetic Reversion in Ichthyosis with Confetti*, 1 year, \$29,244 • **Janghoo Lim**, NIH, *Regulation of Inhibitory Interneuron Development*, 1.9 years, \$460,625 • **Kasia Lipska**, **Victor Montori**, NIH, *QBSafe: A Novel Approach to Care for Older, Complex Adults with Type 2 Diabetes*, 1.9 years, \$466,802 • **Chi Liu**, **Michael Casey**, NIH, *Personalized Task-Based Respiratory Motion Correction for Low-Dose PET/CT*, 5 years, \$3,220,474 • **Carrie Lucas**, NIH, *Novel Signaling Roles for the DNA Damage Response Kinase CHK1 in TCR/ITAM Signaling*, 5 years, \$2,340,351 • **Alexandra MacColl Garfinkel**, NIH, *Mitochondrial Energetics Define Cardiac Patterning and Early Development*, 3 years, \$107,764 • **Robert Malison**, NIH, *Clinical Neuroscience Research Training in Psychiatry*, 5 years, \$1,326,745; NIH, *Imaging Synaptic Density in the Opiate Addicted Brain using 11C UCB J PET*, 2 years, \$460,625 • **Mark Mamula**, **Kevan Herold**, NIH, *Autoimmunity to Protein Modifications in Checkpoint Inhibitor Induced and Spontaneous T1D*, 2 years, \$167,500

Kathleen Martin, **Patrick Gallagher**, NIH, *Coordinated Regulation of Vascular Smooth Muscle Phenotype by p300, CBP, and TET2*, 3.9 years, \$2,198,243 • **Sherry McKee**, SAMHSA, *Collaborative Care Model for Reentering Offenders: The Living-Free Program*, 5 years, \$2,125,000 • **Ruslan Medzhitov**, NIH, *Role of GDF15 in the Regulation of Host Tolerance to Inflammation*, 5 years, \$2,093,750

Wajahat Mehal, NIH, *Inhibition of Sterile Inflammation by Digoxin in Alcoholic Hepatitis*, 4.8 years, \$1,206,325 • **Thomas Melia, Patrick Lusk**, NIH, *Defining the Nucleophagy Mechanism: Opening New Doors for Aging Research*, 1.9 years, \$459,815 • **Jaimie Meyer**, SAMHSA, *CHANGE: Comprehensive Housing and Addiction Management Network for Greater New Haven*, 5 years, \$1,933,368 • **Verica Milivojevic**, NIH, *The Role of Neuroactive Steroids in Stress, Drug Craving, and Drug Use in Cocaine Use Disorder*, 5 years, \$912,980 • **Kyle Mohler**, NIH, *Investigating Mechanisms of Kinase-Mediated Cell Migration in Aggressive Glioblastoma*, 3 years, \$178,586 • **Dennis Moledina**, NIH, *Identification of Non-Invasive Biomarkers and Indices for Diagnosis of Drug-Induced Acute Interstitial Nephritis*, 4.9 years, \$919,510 • **Joan Monin**, NIH, *A Daily Self-Regulation Intervention for Persons with Early Stage Alzheimer's Disease and Related Dementias and their Spouses*, 2 years, \$472,585; NIH, *Attachment Behaviors in Parent Child Dyads Coping with Early Stage Alzheimer's Disease and Related Dementias*, 4.8 years, \$3,905,935 • **Evan Morris**, NIH, *Does Dopamine Mediate Effects of Stress on Inhibitory Control and Smoking Lapse?*, 4.8 years, \$5,396,413 • **Chima Ndumele**, NIH, *Leveraging Physician Networks to Improve Care and Outcomes for Low-Income Populations*, 3 years, \$1,641,256 • **Lena Nguyen**, NIH, *mTORC1-dependent Translational Control in Developmental Epilepsy*, 3 years, \$183,246 • **Stefania Nicoli**, NIH, *PP1L4 Modulation of Notch Links Neurovascular Malformation to Brain Aneurism*, 5 years, \$1,832,030 • **Stefania Nicoli, Karen Hirschi**, NIH, *miR-223 Regulates Endothelial to Hematopoietic Transition*, 1 year, \$99,999 • **Michael Nitabach**, NIH, *Training Program in Molecular Medicine*, 5 years, \$937,333 • **Stephanie Noble**, NIH, *Improving Reliability and Validity of fMRI Statistical Methods*, 11 months, \$47,551 • **Kevin O'Connor**, NIH, *Novel Approaches for Investigating the Pathology of Myasthenia Gravis Autoantibodies*, 1.9 years, \$395,062 • **Stephanie O'Malley**, NIH, *Human Laboratory Paradigms, Task Order 3, Alcohol Cue Human Laboratory Study Testing ANS-6637*, 1.3 years, \$424,177 • **Stephanie O'Malley, Suchitra Krishnan-Sarin, Marina Picciotto, Jody Sindelar**, NIH, *Yale Center for the Study of Tobacco Product Use and Addiction: Flavors, Nicotine, and Other Constituents (YCSTP)*, 5 years, \$2,803,829 • **John Pachankis, Richard Branstrom, Mark Hatzenbuehler**, NIH, *Biopsychosocial Mechanisms Underlying Internalizing Psychopathology in a Prospective, Population-Based Cohort of Sexual Minority Young Adults*, 4.8 years, \$3,728,011 • **Noah Palm**, NIH, *IgA-Glycosylation: Mediator of Microbial Homeostasis and Intestinal Health?*, 2 years, \$460,625 • **Abhijit Patel, David Zhang**, NIH, *Lung Cancer Screening via Ultrasensitive and Cost-efficient Analysis of Tumor DNA Signatures in Blood*, 4.9 years, \$2,569,966 • **Paulina Pawlica, Ian MacRae**, NIH, *Regulation of microRNA Populations by Oncogenic Viruses*, 2 years, \$180,000 • **Christopher Pedigo**, NIH, *The Srf/Pfn1 Axis in Podocyte Biology*, 1 year, \$59,038 • **Dana Peters**, NIH, *Development of MR-derived Parameters of LV Diastolic Function: Validation and Comparison to LV and LA Fibrosis*, 4 years, \$1,830,429 • **Christopher Pittenger, Alan Anticevic**, NIH, *Brain Network Changes Accompanying and Predicting Response to Pharmacotherapy in OCD*, 5 years, \$751,765 • **Renato Polimanti**, NIH, *Investigating the Systems Genetics of the Patterns of Polysubstance Abuse and Addiction*, 2 years, \$369,450 • **Al Powers**, NIH, *A Hearing Test for Hallucinations: Toward Development of Computational Markers for Early Diagnosis*, 5 years, \$983,201 • **Helen Pushkarskaya, Christopher Pittenger**, NIH, *Evidence Accumulation in Obsessive-Compulsive Disorder During Perceptual and Value-Based Decisions*, 1.9 years, \$460,625 • **Valerie Reinke, John Carlson**, NIH, *Predocutorial Training Program in Genetics*, 5 years, \$3,306,534 • **Joseph Ross**, DHHS, *Yale-Mayo Clinic FDA Center of Excellence in Regulatory Science and Innovation (CERSI)*, 5 years, \$19,867,574 • **James Rothman**, NIH, *Regulation of Membrane Fusion in Exocytosis*, 4 years, \$2,701,702 • **James Rothman, Janice Hwang**, NIH, *Glucoregulatory Hormone Interactions in Diabetes*, 5 years, \$3,300,249 • **Helena Rutherford**, NIH, *Addiction and Parenting: The Role of Aberrant Reward Process*, 2 years, \$251,250 • **Alva Sainz**, NIH, *Regulation of Mitochondrial DNA-Mediated Signaling and its Contribution to Cellular and Organismal Aging*, 4 years, \$147,693 • **Kurt Schalper, Soldano Ferrone**, NIH, *Role of the HLA Antigen Presenting Machinery (APM) in Resistance to Pd-1 Axis Blockade in Non-Small Cell Lung Cancer*, 2 years, \$184,465 • **David Schatz**, NIH, *Function and Evolutionary Origins of the RAG Endonuclease*, 5 years, \$2,626,960 • **Mark Schlesinger**, DHHS, *Yale Training Program in*

Health Services Research, 5 years, \$1,585,341 • **Nenad Sestan**, NIH, *1/2 Cell Type and Region-Specific Regulatory Networks in Human Brain Development and Disorders*, 4.7 years, \$6,470,160; NIH, *Technology for Functional Study of Cells and Circuits in Large Postmortem Brains Ex Vivo*, 3 years, \$2,801,084 • **Juliana Shaw**, NIH, *Arg and Cortactin Regulation of the Arp2/3 Complex and its Role in Dendritic Spine Stability*, 2 years, \$76,740 • **Albert Shaw**, NIH, *Midcareer Award in Translational Immunology of Aging*, 4.7 years, \$937,980 • **Sangini Sheth**, NIH, *Implementation of Inpatient Postpartum Human Papillomavirus Immunization*, 5 years, \$680,328 • **Cynthia Shi**, NIH, *HIV Testing and Partner Notification Services for Women in China*, 2 years, \$89,540 • **Gerald Shulman**, NIH, *Development of Controlled Release Mitochondrial Protonophore (CRMP) as a Novel Treatment for Type-2 Diabetes and Non-Alcoholic Steatohepatitis in Dysmetabolic Non-Human Primates*, 5 years, \$2,692,184 • **Frederick Sigworth**, NIH, *High-throughput Electron Cryo-microscope*, 1.5 years, \$1,950,000 • **Michael Simons, William Sessa, Martin Schwartz, Jiasheng Zhang, Zhenwu Zhuang**, NIH, *Molecular Mechanisms of Arterigenesis*, 4.8 years, \$9,546,298 • **Rajita Sinha**, NIH, *Neuroactive Steroid Potentiation to Decrease Alcohol Craving, Normalize HPA Axis Function and Prevent Alcohol Relapse*, 4 years, \$2,762,370 • **Rajita Sinha, Wendy Silverman**, NIH, *Preventing Childhood Obesity Through a Mindfulness-based Parent Stress Intervention*, 5 years, \$3,518,986 • **Dana Small**, NIH, *Cognitive and Affective Influences on Taste Processing*, 2 years, \$1,056,748 • **Marcella Smith, Peter Adams, Rohan Maharaj, Cruz Nazario, Maxine Nunez**, NIH, *Pediatric ECHORN Cohort Study: Intergenerational Factors that Contribute to Cardiovascular Risk in the Eastern Caribbean*, 4.9 years, \$3,551,824 • **Mark Solomon**, NIH, *Regulation of the Anaphase-Promoting Complex*, 2 years, \$670,000 • **Stefan Somlo**, NIH, *Molecular Modulators of Polycystin Signaling*, 4.9 years, \$2,096,442 • **Donna Spiegelman**, NIH, *Comprehensive Translational Science Analytics Tools for the Global Health Agenda*, 2 years, \$1,362,661; NIH, *New Methods for the Design and Evaluation of Large HIV Prevention Interventions*, 6 months, \$681,715; NIH, *Statistical Methods to Account for Exposure Uncertainty in Environmental Epidemiology*, 4.8 years, \$3,104,464 • **Sandra Springer, Ya-Chi Ho, Yuval Kluger**, NIH, *Evaluating the Role of Opioid Medication Assisted Therapies in HIV-1 Persistence for Persons Living with HIV and Opioid Use Disorders*, 2.9 years, \$2,240,779 • **Mario Strazabosco**, NIH, *CFTR Modulates Innate Immune Response in Biliary Epithelium: Role in the Pathogenesis and Treatment of Cystic-Fibrosis-Related Liver Disease*, 4.9 years, \$2,793,761 • **Stephen Strittmatter**, NIH, *Silent Allosteric Modulation of mGluR5 for Safe and Effective Therapy of Alzheimer's Disease*, 5 years, \$8,244,513 • **Valerie Su**, NIH, *Phosphorylation of ICAP1 Inhibits its Nuclear Accumulation to Modulate Integrin and CCM Signaling*, 3 years, \$103,996 • **Tami Sullivan**, Office of Violence Against Women, *Development, Implementation and Evaluation of an Integrated, Peer-Led, Group Intervention for Survivors of Domestic Violence*, 3 years, \$439,540 • **Patrick Sung**, NIH, *Roles of the Nucleic Acid Motor Protein ZGRF1 in Chromosome Damage Repair*, 5 months, \$209,375 • **Hemant Tagare**, NIH, *DaTscan-based Disease Progression Models for Early-stage Parkinson's Disease*, 3.8 years, \$1,405,183 • **Wenwen Tang**, NIH, *The Role of MAP3K2/3 in Modulating Neutrophil ROS Release and its Translational Potential*, 3.9 years, \$1,675,000 • **Jeffrey Testani, Veena Rao**, NIH, *Urine Galectin-3 as a Biomarker of Cardio-renal Phenotype and Prognosis*, 2 years, \$251,250 • **Christian Tschudi**, NIH, *Mechanism of Infectivity Acquisition in African Trypanosomes*, 5 years, \$2,311,805 • **Federico Vaca**, NIH, *Trajectory Outcomes of Teens that Ride with Impaired Drivers & Drive Impaired*, 5 years, \$2,882,196 • **Federico Vaca, Eduardo Romano**, NIH, *Delaying Licensure: Latino Teens Riding with Impaired Drivers and Impaired Driving*, 2 years, \$479,095 • **Flora Vaccarino**, NIH, *1/3 Chromatin Regulation During Brain Development and in ASD*, 2 years, \$550,583; NIH, *Neurodevelopment of Tourette Syndrome*, 4.9 years, \$2,411,751 • **Christopher Van Dyck**, NIH, *PET Imaging of SV2A and Other Biomarkers in Alzheimer's Disease*, 5 years, \$5,540,440 • **Michelle Van Name**, NIH, *Effect of Adiposity on Hepatic and Peripheral Insulin Resistance and Hepatic Steatosis in Pubertal Adolescents with Type 1 Diabetes*, 3 years, \$587,820 • **Vasilis Vasiliou**, NIH, *Fourth International Conference on Alcohol and Cancer*, 1 year, \$30,000; NIH, *Mouse Models and Metabolomics Tools to Investigate Alcohol Metabolism and Tissue Injury*, 4.9 years,

\$2,605,840 • **Vasilis Vasiliou, Yong Zhu**, NIH, *Summer Research Experience in Environmental Health (SREEH)*, 5 years, \$530,035 • **Eric Velazquez, Robert Mertz**, NIH, *TRANSFORM-HF CCC*, 3.9 years, \$6,098,320 • **Terril Verplaetse**, NIH, *Behavioral and Neurochemical Mechanisms Underlying Stress-Precipitated Drinking*, 5 years, \$814,735 • **Joseph Vinetz**, NIH, *Addressing the Global Burden of Leptospirosis in Two Endemic Countries*, 1.3 years, \$424,613; NIH, *Amazonian Center of Excellence in Malaria Research*, 5.4 years, \$6,154,456; NIH, *Predicting Risk of Human Leptospirios by Environmental Surveillance*, 1.6 years, \$370,145; NIH, *Translational Research Development for Endemic Infectious Diseases of Amazonia*, 2.3 years, \$669,457 • **Narendra Wajapeyee**, DoD, *CA170103-A Druggable Epigenetic Vulnerability Pathway in P53-Deficient Hepatocellular Carcinoma*, 9 months, \$699,999 • **Narendra Wajapeyee, Romi Gupta**, NIH, *A Druggable Chromatin Modifier Pathway in HCC*, 9 months, \$103,485 • **Tong Wang**, NIH, *Defective Flow-dependent Tubule Transport in the Pathogenesis of Kidney Disease*, 3.8 years, \$1,500,938 • **Peng Wang**, NIH, *Mental Illness Stigma as a Risk Factor for Substance Use Among Adults with Depression*, 5 years, \$885,918 • **Emily Wang, Cary Gross**, NIH, *Incarceration and Cancer-Related Outcomes (ICRO)*, 4 years, \$1,788,109 • **Scott Weatherbee**, NIH, *Genetic Analysis of Organ Patterning Defects in Ciliopathies*, 5 years, \$1,955,900 • **Daniel Weinberger, Virginia Pitzer**, NIH, *Predicting and Monitoring Variations in the Effects of Vaccines against RSV*, 4.9 years, \$2,278,103 • **Craig Wilen**, NIH, *Role of Virus-Receptor Interactions in Determining Norovirus Tropism and Pathogenesis In Vivo*, 3 years, \$704,633 • **Samuel Wilkinson**, NIH, *Effects of Electroconvulsive Therapy on Suicide in Geriatrics Patients with Major Depressive Disorder: A Nationwide Cohort Study Using Propensity Score Matching and Instrumental Variable Analysis*, 1.9 years, \$460,625 • **John Wysolmerski**, NIH, *PTHrP and Cancer Cachexia*, 1.9 years, \$405,350 • **Catherine Xie**, NIH, *Complement Induces Inflammasome Assembly in Human Endothelium: Mechanisms and Consequences for Graft Rejection*, 4 years, \$137,838 • **Ke Xu**, NIH, *Defining the Impact of Injection Drug Use on Antiretroviral Therapy and HIV Treatment Outcomes: An (epi)genomic Approach*, 5 years, \$2,415,510 • **Ke Xu, Bradley Aouizerat**, NIH, *Feature Selection of DNA Methylation Biosignatures for Neuropathy with Comorbid Drug Abuse in the Setting of HIV Infection*, 4.7 years, \$1,802,256 • **Henry Yaggi, Nancy Redeker, Kevin Sheth**, NIH, *The Recovery in Stroke Using PAP (RISE UP) Study*, 4.8 years, \$3,594,039 • **Xiting Yan**, NIH, *Deep and Integrative Analysis of RNA Sequencing Data to Identify Pathogenesis Heterogeneity of Chronic Lung Disease*, 2 years, \$414,563 • **Georgia Zarkada**, NIH, *Targeting TGFB Signaling to Treat Ocular Neovascular Disease*, 2 years, \$194,006 • **Sheng Zhang**, NIH, *Imaging the Hypothalamus and Motivation Deficits in Cocaine Addiction*, 2 years, \$404,250 • **Z. Jimmy Zhou**, NIH, *Functional Dissection of New Retinal Circuits*, 4 years, \$2,493,312 • **Yong Zhu**, NIH, *Explore piRNA as a Novel Therapeutics for Hepatocellular Carcinoma*, 2 years, \$400,744

Non-federal

Sarah Abdallah, Howard Hughes Medical Institute, *Uncovering Somatic Mosaic Variants in Obsessive-Compulsive Disorder*, 1.7 years, \$43,000 • **Jean Adnopo**, Child Health & Development Inst. of Connecticut, *CHDI Services FY19 Frometa*, 10 months, \$59,408 • **Jean Adnopo, Karen Hanson**, The Nicholson Foundation, *New Jersey Program Consultation*, 7 months, \$21,398 • **Claudio Alarcon**, The V Foundation for Cancer Research, *Epitranscriptomic Regulation of Cancer Metastasis*, 2 years, \$200,000 • **Yomi Alimi**, Howard Hughes Medical Institute, *Pharmacokinetics and Pharmacodynamics of a Novel Antirenalase Monoclonal Antibody in Mice*, 1 year, \$38,000 • **Heather Allore**, University of Massachusetts Medical School (NIH), *Advancing Geriatrics Infrastructure & Network Growth (AGING) Initiative*, 1.7 years, \$86,967 • **Frederick Altice**, Ukrainian Institute on Public Health Policy (NIH), *Integrating Treatment for Mental Disorders in Methadone Clinics in Ukraine*, 4.9 years, \$135,000; State of CT Dept of Public Health, *Comprehensive Syringe Services Program Delivery in the New Haven Area*, 3 years, \$300,000 • **Anika Anam**, Robert E. Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *The Role of Insulin in Endometrial Cancer Pathogenesis: Metabolic Phenotyping of Women with Endometrial Cancer*, 2 years, \$90,000 • **George Anderson**, Missouri Institute of Mental Health, *Post-traumatic Stress Disorder and Traumatic Brain Injury in Women Survivors of Intimate Partner Violence*, 4 months, \$23,400 • **Sanjay Aneja**,

Mednet (NSF), *An Online Peer-to-Peer Resource for Oncologists to Improve Clinical Trial Knowledge and Enrollment*, 1 year, \$47,979 • **Binod Aryal**, American Diabetes Association, *Defining the Role of Glial ANGPTL4 in Lipid Metabolism in the Brain and Obesity*, 3 years, \$190,114 • **Andrea Asnes**, State of CT Dept of Public Health, *DPH—Child Sexual Abuse Program*, 5 years, \$571,171 • **David Assis**, PSC Partners Seeking a Cure, *An Investigation of Biliary-Immune Interactions and Candidate Drug-Screening Using Novel Bile-Derived Organoid Technology*, 2 years, \$60,000 • **Marc Auerbach**, Baylor College of Medicine (DHHS), *National Emergency Medical Services for Children (EMSC) Resource Centers Demonstration CA*, 1.5 years, \$36,660 • **Craig Bailey**, Tauck Family Foundation, *Expanding Social and Emotional Learning in Bridgeport Early Childhood Settings using RULER*, 5 years, \$831,555; Hartford Foundation for Public Giving, *Supporting Social and Emotional Learning in the Capitol Region's Early Childhood Settings*, 3 years, \$299,739 • **Lilanthi Balasuriya**, American Psychiatric Association, *American Psychiatric Association Minority Fellowship*, 2 years, \$26,070 • **Lauren Baldassarre**, American Heart Association, *Advanced Cardiovascular Magnetic Resonance for Detection of Programmed Cell Death Protein-1 Deficient Myocarditis*, 3 years, \$231,000 • **Susan Baserga**, Breast Cancer Alliance, *Targeting the Nucleolus for Breast Cancer Therapy*, 1 year, \$100,000 • **William Becker**, University of Massachusetts Lowell (NIH), *Identifying Opioid Overdose Predictors using EHRs*, 4.7 years, \$274,158 • **Choukri Ben Mamoun**, University of California, Irvine (NIH), *Hit-to-Lead Development of the Kalihinol Scaffold for Malaria Treatment*, 4.9 years, \$1,172,500 • **Adam Berkowitz**, Children's Hospital of Philadelphia, *Preparing for a Hybrid Trial of Pulse Oximetry De-Implementation in Stable Infants with Bronchiolitis*, 4 months, \$2,000 • **Whitney Besse**, PKD Foundation for Research in Polycystic Kidney Disease, *Genetic Approach to Define Mediators of Polycystin-1 Function in Polycystic Kidney Disease*, 2 years, \$160,000 • **Hal Blumenfeld**, Tel Aviv University, *Pilot Study for a Novel Paradigm to Study Consciousness*, 1 year, \$35,744 • **Dowin Boatright**, Northeast Group on Educational Affairs, *Mistreatment and Microaggression against Sexual Minorities in U.S. Medical Schools*, 1 year, \$3,000 • **Krysten Bold**, Robert E. Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *Evaluating the Feasibility and Efficacy of a Real-Time Smoking Intervention Using Wearable Technology*, 2 years, \$90,000 • **Erin Borchardt**, American Cancer Society, *Investigating the Role of RNA Pseudouridylation in the HCV Life Cycle*, 3 years, \$163,500 • **Angelique Bordey**, Tuberosus Sclerosis Alliance, *In Utero Electroporation for TSC Preclinical Research*, 2.5 years, \$50,393 • **Marcus Bosenberg**, The Salk Institute for Biological Studies (NIH), *Mitochondrial Heterogeneity in Melanoma Tumor and Immune Responses*, 1.5 years, \$48,910 • **Kevin Boyé**, American Heart Association, *On-demand Opening of the Blood-Brain Barrier through Unc5B Regulation*, 2 years, \$104,060 • **Marc Brackett**, Dalio Foundation, *Introducing the Principles and Practices of Emotional Intelligence into Connecticut Schools*, 1.2 years, \$700,000 • **Dena Simmons**, University of Virginia, *Evaluating the Impact of RULER, a School-wide Emotion-focused Intervention, on Teacher Well-being, Classroom Climate, and Students' Academic and Social-emotional Skills in Elementary School*, 5 years, \$845,758 • **Christopher Bunick**, William O. Seery Mentored Research Award for Cancer Research, Bank of America, N.A., Trustee, *Development of the First-in-Class Anti-Cancer Therapeutics Targeting Keratin Intermediate Filaments*, 2 years, \$90,000 • **Jian Cao**, Melanoma Research Foundation, *Targeting KDM5 Histone Demethylases to Boost Immune Response In Melanoma*, 2 years, \$100,000 • **Jessica Cardin, Michael Higley**, Simons Foundation, *Identifying Convergent Neural Circuit Impairments in Autism*, 3 years, \$974,341 • **Grace Carroll**, International Society for Research in Human Milk and Lactation, *Estimating the Cost of Implementing a Maternity Cash-Transfer System in Low- and Middle-Income Countries to Improve Breastfeeding Outcomes*, 8 months, \$9,816 • **Jessica Cerdena**, The Wenner-Gren Foundation for Anthropological Research, *Epigenetic Embodiment of Intergenerational Trauma in Latin American Migrants in New Haven, Connecticut*, 1.2 years, \$19,828 • **Julius Chapiro, Lynn Savic**, Society of Interventional Oncology (SIO), *Molecular Imaging Biomarkers for the Characterization of the Tumor*

Microenvironment Effects on the Immune Response in Liver Cancer Treated with TACE, 2 years, \$100,000 • **Sarwat Chaudhry**, Mayo Clinic of Rochester (NIH), *Unintended Prolonged Opioid Use*, 4 years, \$265,015 • **Arun Chavan**, Cancer Research Institute, *Dissecting the Evolutionary Origin of Lymphocytes*, 3 years, \$175,500 • **Sidi Chen**, Sontag Foundation, *Functional Interrogation of Molecular Drivers in Gliomagenesis*, 4 years, \$600,000 • **Hyung Chun**, American Heart Association, *Translating the Apelinergic Pathway for Cardiometabolic Health*, 3 years, \$300,000 • **Paul Cleary**, University of Connecticut Health Center (DHHS), *State Innovation Model Quality Scorecard*, 7 months, \$67,190 • **Elizabeth Connors**, **Jacob Tebes**, University of Maryland (SAMHSA), *Supplement to the 2018 Mental Health Technology Transfer Center Cooperative Agreements*, 1.1 years, \$22,631 • **Zack Cooper**, National Institute for Health Care Management Foundation, *Why Does the U.S. Overinvest in Technology? The Curious Case of MRI Scanners*, 2 years, \$88,607 • **Zafra Cooper**, Harvard University (NIH), *ESSENCE (Enabling translation of Science to Service to Enhance Depression Care)*, 11 months, \$38,337 • **Peter Cresswell**, **Joanna Pawlak**, Netherlands Organisation for Scientific Research, *Unraveling the Mechanisms Behind Peptide Loading and Editing During Antigen Cross-Presentation: Implications for Cancer and Viral Infections*, 2 years, \$153,724 • **Patrick Cudahy**, American Society of Tropical Medicine and Hygiene, *Biomarkers of Treatment Response and Composition of Multi-drug Resistant Mycobacterium Tuberculosis Strains During Treatment*, 1 year, \$65,000 • **Leslie Curry**, Regents of the University of California, *Linking Health Care and Social Services for Older Adults: Area Agencies on Aging as Key Partners*, 1 year, \$10,767 • **William Damsky**, Dermatology Foundation, *Elucidating and Overcoming Mechanisms of Immunotherapy Resistance in Melanoma*, 2 years, \$110,000; Skin Cancer Foundation, *Elucidating and Overcoming Mechanisms of Immunotherapy Resistance in Melanoma*, 2 years, \$50,000; • **Larry Davidson**, State of CT Dept of Mental Health and Addiction Services (SAMHSA), *Promoting Integrated Care in Connecticut (PIC-CT) 19MHA1044*, 1 year, \$180,000 • **Andrea Diaz Stransky**, American Academy of Child and Adolescent Psychiatry, *Digital Delivery of Parent Training for Disruptive Behaviors: Increasing Access to Care (#2)*, 1.3 years, \$15,000; American Psychiatric Association, *APA SAMHSA Minority Fellowship Travel Funds*, 1 year, \$28,199 • **Weilai Dong**, American Heart Association, *Inspect Genomic Architecture of Congenital Heart Disease by Integrating SNVs and CNVs*, 2 years, \$53,688 • **Rachel Dreyer**, McGill University, *Sex and Gender-related Differences in Access to Care for Premature ACS: Does the Health Care System Matter?*, 1.5 years, \$97,663 • **Deepak D'Souza**, Wallace Research Foundation, *Efficacy and Safety of DMT for Major Depression*, 1 year, \$213,930 • **Nan Du**, American Academy of Pediatrics, *Healthy Child Curriculum for Refugee Families*, 1 year, \$2,000 • **Kathleen Duffany**, Southern Connecticut State University (DHHS), *Racial and Ethnic Approaches to Community Health (REACH)*, 5 years, \$129,825 • **James Duncan**, **Pamela Ventola**, University of California, Los Angeles (NIH), *Parsing ASD Heterogeneity: Neuroendophenotypes of Social Attention and Sensory Responsivity*, 1.6 years, \$179,130 • **James Duncan**, **Denis Sukhodolsky**, University of Virginia (NIH), *Multimodal Developmental Neurogenetics of Females with ASD*, 3.8 years, \$284,981 • **Arijit Dutta**, University of Texas Medical Branch, *Mechanism of R-loop Resolution in the Human Genome via the BRCA1-BARD1-SETX Axis*, 1 year, \$66,055 • **Guido Falcone**, Neurocritical Care Society, *A Cloud Computing-based, Fully Automated Imaging Pipeline to Evaluate Perihematomal Edema in Intracerebral Hemorrhage*, 1 year, \$77,000; University of California, Irvine (NIH), *Genetic Variation, Stress, and Functional Outcomes after Stroke Rehabilitation/The STRONG Study*, 1.2 years, \$17,588 • **Shelli Farhadian**, American Federation for Aging Research, *Neurocognitive Impairment in Older Adults with HIV Infection: A Single Cell Approach*, 2 years, \$120,000; Robert E Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *Central Nervous System Immune Activation During Virologically Suppressed HIV*, 2 years, \$90,000 • **Liana Fasching**, Tourette Association of America (formerly Tourette Association), *Single Nuclei Transcriptome Analysis of Human Striatal Interneurons in Tourette Syndrome*, 1 year, \$50,000 • **Michelle Ferreira**, Melanoma Research Foundation, *Evaluating the Role of the COX2/PGE2 Pathway in Antimelanoma Immunity*, 1 year, \$3,000 • **David**

Fiellin, New York University School of Medicine (NIH), *Reducing Morbidity and Mortality from Overdose, HIV, and Hepatitis C in Opioid-Using Persons*, 1.8 years, \$135,490 • **Erol Fikrig**, University of Maryland (NIH), *Tick Immune Signaling, Microbiota, and Acquisition of Borrelia burgdorferi and Anaplasma phagocytophilum*, 5 years, \$2,093,750; L2 Diagnostics (NIH), *Vaccine for Zika Virus*, 11 months, \$178,212; University of Connecticut Health Center (NIH), *The Role of UBXNs in Antiviral Immunity*, 1.4 years, \$71,935 • **John Forrest**, Medtronic, *Structural Heart Disease Fellowship in Advanced Interventional Cardiology/Cardiac Surgery 2018-2019*, 1 year, \$20,000; Edwards Lifesciences, *Structural Heart Disease Fellowship 2018-2019*, 1 year, \$40,000 • **Marina Freudzon**, Dermatology Foundation, *Understanding the Role of GILT in Malaria Transmission in Skin*, 1 year, \$30,000 • **Gerald Friedland**, Columbia University (NIH), *Impact of a Multimodal Intervention to Reduce Dual Stigma and Improve Treatment Outcomes in HIV/Drug-resistant TB Co-infected Patients in KwaZulu-Natal, South Africa*, 1.8 years, \$33,326 • **Lisa Fucito**, ICF Macro, Inc. (NIH), *Smoke-freeTXT eReferral Program*, 1 year, \$150,000 • **Patrick Gallagher**, University of Pittsburgh (NIH), *Precision Transfusion Medicine*, 4.9 years, \$41,875 • **Suhas Ganesh**, Brain & Behavior Research Foundation (formerly NARSAD), *The Effects of Cannabis Exposure on the Adolescent Human Epigenome- a Longitudinal Study*, 2 years, \$69,824 • **Gael Genet**, American Heart Association, *EndophilinA2 Mediated VEGFR2 Endocytosis Promotes Endothelial Cell Migration*, 1 year, \$56,140 • **Nafiisha Genet**, American Heart Association, *Connexin 43 Regulates Neurogenesis in the Adult Brain Subventricular Zone*, 6 months, \$27,158 • **Janneane Gent**, Mayo Clinic of Rochester, *Olmsted County, Minnesota Air Quality Study (OMAQ)*, 3 years, \$81,556 • **Mark Gerstein**, University of Massachusetts, Worcester (NIH), *Discovery and Validation of Neuronal Enhancers Associated with the Development of Psychiatric Disorders (Psychdac)*, 1.7 years, \$736,904 • **Mark Gerstein**, **Henry Hsia**, Augusta University (Formerly Georgia Regents University) (NIH), *Characterization of Cellular and Molecular Heterogeneity in Human Diabetic Foot Ulcers*, 2 years, \$272,097 • **David Gibb**, American Society of Hematology, *Elucidating Mechanisms of Transfusion-induced Interferon Production and RBC Alloimmunization*, 3 years, \$99,999 • **Thomas Gill**, University of Florida (NIH), *Wearable technology infrastructure to enhance capacity for Real-time, Online Assessment and Mobility Monitoring (ROAMM) of intervening health events in older adults*, 2 years, \$14,504 • **Sarah Goldberg**, Leidos Biomedical Research (Formerly SAIC_Frederick) (NIH), *Predictors of Benefit from Osimertinib with or without Bevacizumab in Patients with EGFR Mutant Lung Cancer and Brain Metastases_15X147702*, 10 months, \$272,128 • **Pallavi Gopal**, Amyotrophic Lateral Sclerosis Association (ALS Association), *Effect of Ataxin-2 Intermediate Length Polyglutamine Expansion on TDP-43 RNP Granule Dynamics*, 2 years, \$200,000 • **Elena Gracheva**, Richard & Susan Smith Family Foundation, Newton, MA, *Regulation of Fluid and Ionic Balance Under Extreme Physiological States in a Mammalian Hibernator*, 2 years, \$300,000 • **Valentina Greco**, Leo Foundation, *The 2019 Gordon Research Conference on Epithelial Differentiation and Keratinization (GRC-EDK)*, 1 year, \$22,384 • **Carlos Grilo**, Drexel University (NIH), *Enhancing Behavioral Weight Loss Interventions for Binge Eating Disorder*, 1.5 years, \$21,663 • **Giovanna Guerrero-Medina**, University of Puerto Rico en Cayey (NIH), *Enhancing Research Training through Empowerment, Resilience, and Civic Engagement*, 2 years, \$168,980 • **Seth Guller**, Imperial College School of Medicine (NIH), *Modulation of Trophoblast Differentiation and Function by Maternal Immune Cell Exosomes*, 1.7 years, \$117,396 • **Junjie Guo**, Brain & Behavior Research Foundation (formerly NARSAD), *Role of FMRP in Synaptic Localization of Neuronal RNAs*, 2 years, \$70,000 • **Junjie Guo**, Muscular Dystrophy Association, *Molecular Determinants of Repeat RNA Foci Formation in C9ORF72-associated ALS*, 3 years, \$297,678 • **David Hafler**, National Multiple Sclerosis Society, *Longitudinal, Single-cell Assessment to Define the Mechanism of B Cell Depletion Therapy in Multiple Sclerosis*, 3 years, \$825,000 • **Brendan Hare**, Brain & Behavior Research Foundation (formerly NARSAD), *Establishing Medial Prefrontal Cortex Rapid Antidepressant Circuits*, 2 years, \$70,000 • **Annie Harper**, Fahs-Beck Fund for Research and Experimentation at The New York Community Trust, *Criminal Justice Related Debt and Mental Health: Barriers to Re-entry and Recovery*, 2 years, \$20,000 • **Shilpa Hattangadi**, Hyundai Hope on Wheels, *Signature*

Molecular Markers in Diamond Blackfan Anemia (DBA) Patients' Blood Cells that Predict Predisposition to Myelodysplasia/ Acute Myeloid Leukemia (MDS/AML), 1 year, \$100,000 • **Harrison Hayward**, American Academy of Pediatrics, *Immigrant Status and Healthcare Resource Eligibility*, 1.2 years, \$2,000 • **Robert Hecht**, The Alliance for International Medical Action, *Nutrition Cost Effectiveness Analyses*, 1 year, \$49,100 • **Ya-Chi Ho**, University of Utah (NIH), *Center for the Structural Biology of Cellular Host Elements in Egress, Trafficking, and Assembly of HIV (Cheetah Center)*, 1.6 years, \$75,000 • **Ellen Hoffman**, United States-Israel Binational Science Foundation, Jerusalem, Israel, *Modeling Autism Risk Genes in Zebrafish*, 5 years, \$135,000 • **Ellen Hoffman**, **Ted Abel**, Simons Foundation, *Translating Drug Discovery in Zebrafish and Mouse Models of ASD Risk Genes*, 3 years, \$742,998 • **Theodore Holford**, Regents of University of Michigan/UMH (NIH), *Center for the Assessment of the Public Health Impact of Tobacco Regulations [(1) Project 1: Comparative Modeling of the Impact of E-cigarettes Use on Smoking and Long-Term Health Outcomes, (2) Project 3: Examining the Health and Policy Impacts of Tobacco-Related Health Disparities Associated with Polyto-bacco Use, (3) Data Analysis and Dissemination Core (DAD)]*, 1 year, \$377,041 • **Henry Hsia**, Plastic Surgery Foundation, *iPSC Based Tissue Engineered Graft for Wound Healing*, 2 years, \$49,998 • **Evelyn Hsieh Donroe**, Rheumatology Research Foundation, *Rheumatoid Arthritis and HIV: Establishing a Comparative Model to Understand the Role of Chronic Inflammation in Systemic Bone Loss*, 2 years, \$100,000 • **Chun Chieh Hsu**, Cancer Research Institute, *Regulation of Translation by the Interferon-induced Antiviral Protein Viperin*, 3 years, \$175,500 • **Jamie Hu**, American Skin Association, *Biodegradable Bioadhesive Nanoparticle (BNP) Drug Delivery in the Treatment of SCC*, 1 year, \$7,000 • **Henry Huang Huang**, Centre for Addiction and Mental Health, *Development of 18F-labeled Radioligands for Synaptic Density Imaging*, 11 months, \$247,615 • **Izuchukwu Ibe**, Orthopaedic Research & Education Foundation, *Metastatic Breast Cancer and the Induction of Bone Resorption*, 1 year, \$5,000 • **Cristian Ionita**, Cure SMA, *SMA Care Center Network*, 1 year, \$60,000 • **Melinda Irwin**, Breast Cancer Research Foundation, *Physical Activity, Diet, Weight and Breast Cancer Survivorship*, 1 year, \$250,001 • **Ryan Jensen**, University of Pennsylvania, *Defining the Molecular Mechanisms Underlying BRCA2 and RAD51 PARP Lesion Processing*, 2 years, \$100,000 • **Raymond Johnson**, L2 Diagnostics (NIH), *Development of a Point of Care Diagnostic Screening Test for Kawasaki Disease*, 1 year, \$67,501 • **Ayana Jordan**, American Academy of Addiction Psychiatry (SAMHSA), *Mentoring Early Career Trainees for Culturally Informed Careers in Addiction Medicine and Addiction Psychiatry*, 2 years, \$239,347 • **Roger Jou**, **Abha Gupta**, Simons Foundation, *2019 Simons Foundation Powering Autism Research for Knowledge (SPARK) Clinical Site Network—Yale University*, 3 years, \$600,000 • **Kellie Jurado**, Charles H. Revson Foundation, *Leveraging Native Immune Functions: Antibody Access to the Central Nervous System*, 11 months, \$100,256 • **Inamul Kabir**, American Heart Association, *Integrin-CD36 Axis in Smooth Muscle Cell Fate and Clonality in Atherosclerosis*, 2 years, \$104,060 • **Amanda Kallen**, Washington University in St. Louis (NIH), *Reproductive Scientist Development Program (K12)-Scholar*, 3 months, \$29,100 • **Rebecca Kamody**, Society of Pediatric Psychology, *Society of Pediatric Psychology Diversity Research Grant: Examining Disordered Eating and Weight Disparities Among Transgender and Gender Nonconforming Youth*, 1 year, \$5,000 • **Erdem Karatekin**, University of Nebraska Medical Center (NIH), *Regulation of Photoreceptor Neurotransmission*, 1.5 years, \$198,233 • **Joy Kaufman**, State of CT Dept of Children and Family Services (SAMHSA), *Evaluation of Connecticut Network of Care (CONNECT) Extension*, 1 year, \$112,687 • **Alfred Kaye**, Brain & Behavior Research Foundation (formerly NARSAD), *Circuit Mechanisms of a Pupillary Biomarker for Stress-induced Hyperarousal*, 2 years, \$70,000 • **Benjamin Kelmendi**, Brain & Behavior Research Foundation (formerly NARSAD), *The Effects of MDMA on Prefrontal and Amygdala Activation in Post-traumatic Stress Disorder*, 2 years, \$69,089 • **Trace Kershaw**, University of Maryland, Baltimore County (NIH), *Preventing HIV/AIDS by Building Capacity to Reduce Stigma Among Providers for Pregnant Women in Rural Haiti*, 1.8 years, \$25,900 • **Brigid Killelea**, Breast Cancer Alliance, *Interdisciplinary Breast Fellowship*, 1 year, \$75,000 • **Robert King**, University of California, San Francisco (NIH), *2/7-Collaborative*

Genomic Studies of Tourette Disorder, 2.2 years, \$122,958 • **Robert King**, Rutgers, The State University of New Jersey, *Rutgers Service Agreement*, 1 year, \$46,056 • **Brandon Kitay**, Association of Directors of Medical Student Education in Psychiatry (ADMSEP), *Proposal for a Clinical Simulation Initiative (CSI) eModule on Electroconvulsive Therapy (ECT)*, 1 year, \$2,500 • **Steven Kleinstein**, United States-Israel Binational Science Foundation, Jerusalem, Israel, *Machine Learning Approaches for Classification of Immunological Repertoires*, 4 years, \$81,000 • **Steven Kleinstein**, Washington University in St. Louis (NIH), *B Cell Receptor Repertoire Sequencing Data Analysis*, 9 months, \$30,050 • **Albert Ko**, Emory University (NIH), *Task Area B Option 3.B; 17-0111*, 1 year, \$14,989 • **Jonathan Koff**, Jackson Laboratory (NIH), *Modulation of Lung Immune Responses to Viral Infection*, 5 years, \$41,860 • **Anthony Koleske**, Dr. Ralph and Marian Falk Medical Research Trust Bank of America, N.A., Trustee, *Modulators of TRIO Guanine Nucleotide Exchange Factor Activities as New Therapeutics for Schizophrenia, Autism, and Related Disorders*, 1.6 years, \$300,000; Broad Institute, *Biochemical and Functional characterization of Disease Associated TRIO Variants*, 1 year, \$135,926 • **Iryna Kolosenko**, American Association of Immunologists, *2019 American Association of Immunologists Fellowship Program for Career Reentry*, 1 year, \$50,760 • **Harlan Krumholz**, **Erica Spatz**, Texas A&M Engineering Experiment Station (NIH), *SCH: INT: A Context-aware Cuff-less Wearable Ambulatory Blood Pressure Monitor using a Bio-Impedance Sensor Array*, 3.8 years, \$34,247 • **Priti Kumar**, University of Wisconsin-Madison (NIH), *Exploiting Natural Post-Integration Barriers to Restrict HIV-1 Replication*, 1.9 years, \$197,927 • **Gary Kupfer**, University of Texas Health Science Center at San Antonio (NIH), *Mechanistic Dissection of the Falconi Anemia Pathway of DNA Damage Response and Repair*, 1.2 years, \$211,219 • **Angela Lek**, University of Massachusetts, Worcester (NIH), *Novel Therapeutics for FSHD*, 1.7 years, \$85,134; Cure Rare Disease (formerly Terry's Foundation for Muscular Dystrophy), *Exploration of Upregulation of Certain Non-muscle Full-length Dystrophin Isoforms*, 1.5 years, \$157,995 • **Monkol Lek**, Jain Foundation, *Application of CRISPR Base Editing in Dysferlinopathies*, 9 months, \$26,670; Neuromuscular Disease Foundation, *GNE Myopathy Biobank*, 1 year, \$83,600 • **Morgan Levine**, University of Southern California (NIH), *Biological Underpinnings of Socioeconomic Differentials In Health And Mortality*, 1.3 years, \$13,390; Glenn Foundation for Medical Research, *Glenn Award for Research in Biological Mechanisms of Aging*, 2 years, \$60,000 • **Chiang-Shan Li**, University of Texas Health Science at Houston (NIH), *Large-scale Network Modeling for Brain Dynamics: Statistical Learning and Optimization*, 1 year, \$28,550 • **Karel Liem**, PKD Foundation for Research in Polycystic Kidney Disease, *Role of Interstitial Cells Renal Cystogenesis*, 2 years, \$160,000 • **Renelle Lim**, The Tumori Foundation, *Underpinnings of Response to Immunotherapy in Uveal Melanoma*, 1.6 years, \$95,560 • **Erika Linnander**, Gavi The Vaccine Alliance, *Implementation of an EPI Management Training Programme—Francophone Africa COHORT 2*, 1 year, \$586,119 • **Alicia Little**, Robert E. Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *Role of T Follicular Helper (Tfh) Cells in Chronic Cutaneous Lupus Erythematosus*, 2 years, \$90,002 • **Yansheng Liu**, Columbia University (NIH), *Elucidation of Combination Drug Perturbations by Molecular Profiling of Colorectal Cancer Signaling Networks*, 1 year, \$90,701 • **Jun Liu**, University of Georgia (NIH), *Role of Cardiolipin in Helicobacter Pylori Flagellar Biogenesis*, 5 years, \$168,000 • **Erin Longbrake**, Cleveland Clinic Foundation, *Central Vein in Multiple Sclerosis Pilot Study*, 2 years, \$12,500 • **Patricia LoRusso**, Translational Genomics Research Institute (TGen) (NIH), *Individualized Monitoring of Treatment Response and Resistance in Patients with Metastatic Melanoma*, 1.5 years, \$50,250 • **Jiesi Luo**, American Heart Association, *Xenogeneic-free Readily Available Tissue Engineered Blood Vessel from Human Induced Pluripotent Stem Cells*, 2 years, \$114,368 • **Steven Marans**, New Alliance Foundation, *Child Development-Community Policing Engagement*, 1 year, \$5,000; New Haven Dept. of Police Service, *Protecting and Serving Training for the New Haven Police Department*, 8 months, \$5,200; New Haven Dept. of Police Service, *Protecting and Serving: Enhancing Law Enforcement Response to Children Exposed to Violence*, 5 months, \$7,150 • **Molly Markowitz**, American Academy of Pediatrics, *Financial Wellness in a Medical Home*, 1 year, \$2,000 • **David Matuskey**, Brain & Behavior Research Foundation (formerly NARSAD), *PET Imaging*

of *Synaptic Density in Autism Spectrum Disorder*, 2 years, \$70,000 • **Linda Mayes**, The Irving Harris Foundation, *Approach to Training and Relationship to Infant Mental Health Community*, 3 years, \$345,000; Boston Medical Center, *Improving Preterm Outcomes by Safeguarding Maternal Mental Health*, 1 year, \$40,798

Adam Mecca, American Brain Foundation, *Investigation of Molecular Changes in mGluR5 and SV2A to Study Synaptic Alterations in Alzheimer's Disease Using PET*, 1.3 years, \$3,410 • **Eric Meffre**, Lupus Research Alliance (formally: Alliance for Lupus Research), *PTPN22 Function in Human B Cells and Inhibition to Reset Tolerance in SLE*, 3 years, \$552,706 • **Saral Mehra**, Medical Device Business Services, *Educational Grant Fellowship*, 1 year, \$20,250 • **Andrew Miranker**, Richard Lounsbery Foundation, *AMBER: Analysis of Microbiome Embedded in aRt*, 1.5 years, \$119,812 • **Pramod Mistry**, Genzyme Corporation, *Yale Center of Excellence in Clinical Translational Research in Gaucher Disease*, 3.5 years, \$2,860,948 • **Angela Montgomery**, University of North Carolina at Chapel Hill (NIH), *Environment, Epigenetics, Neurodevelopment & Health of Extremely Preterm Children*, 5 years, \$175,900 • **Ruth Montgomery**, Children's Hospital Corporation, (formerly CHB), *Systems Biology to Identify Biomarkers of Neonatal Vaccine Immunogenicity*, 3 months, \$10,368

Christopher Moore, Phillips Research North America, *Automated B-line Assessment in Lung Ultrasound*, 1 year, \$98,899 • **Walther Mothes**, Drexel University (NIH), *Structure-Based Antagonism of HIV-1 Envelope Function in Cell Entry*, 2 years, \$327,443 • **Angus Nairn**, Massachusetts General Hospital (NIH), *The Massachusetts and Yale ADCR Collaborative Proteomic Biofluid Biomarker Discovery Program*, 1.7 years, \$737,063 • **Anirvan Nandy**, E. Matilda Ziegler Foundation for the Blind, *The Impact of Eye-movements on Neural Dynamics and Cortical Organization*, 3 years, \$240,000 • **Onyema Ogbuagu**, National Academy of Sciences, *Assistance in Management of USAID's Partnerships with NSF and Related Activities to Promote Global S&T Partnerships (PEER Health)*, 1.5 years, \$119,099

Emily Olsson, American Academy of Child and Adolescent Psychiatry, *Pilot Study Investigating the Role of De Novo Genetic Variants in Trichotillomania*, 1.3 years, \$15,000 • **John Pachankis**, Rutgers, the State University of New Jersey (NIH), *Building Mobile Health HIV Prevention and Mental Health in Low-resource Settings*, 1.8 years, \$335,273 • **A. David Paltiel**, Massachusetts General Hospital (NIH), *Optimizing HIV Care in Less Developed Countries*, 1.5 years, \$50,366; Stanford University (NIH), *Making Better Decisions: Policy Modeling for AIDS and Drug Abuse*, 4.8 years, \$608,849

Michael Pantalon, **Gail D'Onofrio**, Yale New Haven Health System (SAMHSA), *Project ASSERT*, 5 years, \$1,121,188 • **Sunil Parikh**, Colorado State University (NIH), *Repeat Ivermectin Mass Drug Administrations for Malaria Control II (RIMDAMAL II): A Double-blind Cluster Randomized Trial for Integrated Control of Malaria*, 1.5 years, \$167,500 • **Bhinna Park**, American Psychiatric Association, *Mental Health Resources for Refugees/Asylees in Conjunction with the International Rescue Committee (IRC)*, 1 year, \$19,210

Christine Park, Frederick A. Collier Surgical Society, *Targeting Small Intestinal Serotonin Receptors as Therapy for Intestinal Failure*, 1.2 years, \$15,000 • **Abhijit Patel**, **Alessandro Santin**, The Honorable Tina Brozman Foundation for Ovarian Cancer Research, *Integrated Analysis of Circulating Tumor DNA and Protein Biomarkers for Early Detection of Ovarian Cancer*, 2 years, \$200,000

Candice Paulsen, Rita Allen Foundation, *Uncovering the Regulation of TRPA1 by Irritants, Cofactors, and Proteins*, 3 years, \$150,000 • **Paulina Pawlica**, American Cancer Society, *Regulation of microRNA Populations by Oncogenic Viruses*, 2 years, \$54,000 • **Sam Payabvash**, **Gordon Sze**, Radiological Society of North America, *Grant Transfer Request Evaluation of White Matter Connectome Changes in Children with Sensory Processing Disorders using EDI*, 1 year, \$8,193 • **Godfrey Pearlson**, Hartford Hospital (NIH), *Neuroimaging Predictors of Bariatric Surgical Outcomes*, 1.4 years, \$85,649 • **Bruno Balbo Pedroso**, PKD Foundation for Research in Polycystic Kidney Disease, *Targeting the Cell Cycle as a Potential Treatment for ADPKD: The Role of Cyclin-Dependent Kinase 1*, 2 years, \$120,000 • **Peter Peduzzi**, University of California, Los Angeles (NIH), *Pragmatic Trial of the Effectiveness and Cost-Effectiveness of Dementia Care*, 11 months, \$703,096 • **Dana Pepe**, Infectious Diseases Society of America, *Expanding Utilization of Targeted Assessment for Prevention (TAP) Strategy in Connecticut*, 1 year, \$100,000 • **Richard Pierce**, University of Utah (NIH), *Mechanisms of Endothelial Cell*

Dysfunction in Critically Ill Children, 2 years, \$62,393 • **Margaret Pisani**, Brigham and Women's Hospital (NIH), *Epidemiology and Risk of Antipsychotic Use in Hospitalized Elderly with Delirium*, 1 year, \$16,951 • **David Pitt**, Cornell University, *Joan and Sanford I. Weill Medical College of (NIH), No-Gd MRI for Monitoring Disease Status in Multiple Sclerosis*, 4.9 years, \$146,263 • **Christopher Pittenger**, University of Utah (NIH), *Exploring the Role of Neurosteroids in Tic Modulation*, 2 years, \$122,446 • **Krystal Pollitt**, University of Massachusetts Amherst, *Public Health Assessment for Transportation Projects*, 1.6 years, \$43,000 • **Zorana Pringle**, Ontario Hospital Association, *Emotion Revolution in the Workplace Initiative: Partnership between the Yale Center for Emotional Intelligence and Ontario Hospital Association*, 1.1 years, \$250,000

Caihong Qiu, Chinese Academy of Science, *Service Contract between Chinese Academy of Sciences, Institute of Zoology and Yale University on behalf of Yale Stem Cell Center hESC/iPSC Core*, 1 year, \$19,000 • **Anthony Rampello**, Dystonia Medical Research Foundation, *A Genetic Approach toward Identifying Torsin Function in Relation to DYT1 Dystonia*, 2 years, \$100,000 • **Yusuf Ransome**, Brown University (NIH), *The Role of Faith Institutions, and Religion and Spirituality (R/S) Experiences in HIV Prevention and Care Strategies Among African American Men Who Have Sex With Men*, 2 years, \$19,000 • **Uma Reddy**, University of Alabama at Birmingham (NIH), *Antihypertensive Therapy for Mild Chronic Hypertension during Pregnancy: A Pragmatic Multicenter Randomized Trial (CHAP Project)*, 1 year, \$132,241

Carrie Redlich, State of CT Dept of Labor, *Proposal for the Provision of Occupational Health Clinic*, 1 year, \$78,203 • **David Reiss**, Regents of the University of California (NIH), *Interdisciplinary Research Network on Early Adversity & Later Life Reversibility—Administrative Supplement*, 1.1 years, \$106,121 • **Chin Reyes**, Spencer Foundation, *The Silent Struggle: Exploring the Role of Social and Emotional Interactions in the Language Development of Young English Language Learners*, 1.5 years, \$49,987 • **David Rimm**, Breast Cancer Research Foundation, *Targeted and Immune Therapies in Breast Cancer*, 1 year, \$250,000; Johns Hopkins University (NIH), *PD-1/PD-L1 Modulation in Cancer Therapy*, 1 year, \$51,325 • **Aaron Ring**, University of Minnesota (DoD), *Mechanisms of Resistance to Immunotherapy in Osteosarcoma*, 2 years, \$25,781; University of Minnesota, *Novel Immunotherapy for Sarcomas using Combination Oncolytic VSV and IL-18 Superkine*, 1 year, \$40,700, Dr. Ralph and Marian Falk Medical Research Trust Bank of America, N.A., Trustee, *Breaking the Vicious Cycle of Necroptosis and Inflammation with a Therapeutic "Molecular Shroud"*, 1 year, \$300,000 • **Kurt Roberts**, Foundation for Surgical Fellowships, *Grant Acceptance and Agreement 2018-2019. Yale Bariatric MIS Fellowship*, 1 year, \$20,000 • **Brita Roy**, Hennepin Healthcare Research Institute, *Reframing Healthcare Through the Lens of Co-production (RHeLaunCh)*, 1 year, \$33,676 • **Changwan Ryu**, Parker B. Francis Foundation, *Mitochondrial DNA as a Novel Biomarker in Idiopathic Pulmonary Fibrosis*, 3 years, \$156,000; Foundation for Sarcoidosis Research, *Association Between Extracellular Mitochondrial DNA and Poor Clinical Outcomes in African American Patients with Sarcoidosis*, 2 years, \$250,000

Fatima Saddouk, American Heart Association, *Reversal of Vascular Remodeling in Pulmonary Hypertension*, 2 years, \$104,060 • **Gerard Sanacora**, Amyotrophic Lateral Sclerosis Association (ALS Association), *Characterization of Mitochondrial Function and Neuron-Glial (Glutamate/GABA) Neurotransmitter Cycling in a Mouse Model (SOD1-G93A) of Amyotrophic Lateral Sclerosis using 1H-[13C] NMR Spectroscopy*, 1.1 years, \$99,938 • **Anjali Sankar**, AIM Youth Mental Health, *Corticolimbic System Functioning during Emotion Regulation in Youth with Bipolar Disorder and its Changes with a Targeted Psychobehavioral Intervention*, 1.2 years, \$63,849 • **Carolyn Sartor**, Peter F. McManus Charitable Trust, *Refining Etiological Models of Drinking Behaviors in Black Adolescents and Young Adults through Consideration of Understudied Risk and Protective Factors*, 1 year, \$49,999 • **Dustin Scheinost**, Columbia University (NIH), *Intergenerational Transmission of deficits in Self-Regulatory Control*, 1.3 years, \$88,454 • **Michael Schilsky**, Wilson Disease Association, *Wilson Disease Registry Study*, 4 years, \$2,806,044 • **Mark Schlesinger**, University of Wisconsin-Madison, *Patients Experiences with Breast Cancer*, 1 year, \$33,407 • **Martin Schwartz**, Foundation Leducq for Cardiovascular Research (formally Foundation Leducq), *Transcription Factor Klf2 and Cardiovascular Disease*, 5 years, \$1,162,525

Emre Seli, Foundation for Embryonic Competence, *Investigation of the Role of*

Mitochondrial Dynamics in Female Reproduction, 2 years, \$351,250 • **Dongju Seo**, Peter F. McManus Charitable Trust, *The Development of Technology-Assisted Alcoholism Prevention*, 2 years, \$49,999 • **Nenad Sestan**, Simons Foundation, *Gene Regulatory Control of Prefrontal Cortex Development and Evolution*, 3 years, \$825,000 • **Nenad Sestan**, **Sirisha Pochareddy**, Joan and Sanford I. Weill Medical College of Cornell University (NIH), *The Spatiotemporal Landscape of the Human Brain Epi-transcriptome*, 1.8 years, \$250,000 • **Lokesh Sharma**, American Thoracic Society, *Mechanisms of Bacterial Dissemination in Lung Infection with Klebsiella pneumoniae*, 1 year, \$40,000 • **Albert Shaw**, Boston Children's Hospital (NIH), *Service Core 2: Proteomics Core—Study Flu Vaccine-induced Changes in Plasma Proteome*, 1.3 years, \$10,368 • **Beverley Sheares**, Wayne State University (NIH), *Translating an Efficacious Illness Management Intervention for African American Youth with Poorly Controlled Asthma to Real World Settings*, 1.5 years, \$16,578 • **Mohamed Sherif**, Robert E. Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *An Electrophysiological Investigation of Mechanisms Underlying the Rapid Antidepressant Effect of Ketamine*, 2 years, \$90,000 • **Kevin Sheth**, **Serena Spudich**, Massachusetts General Hospital (NIH), *Yale Clinical Site: Investigations for Improved Neurological Treatments at Yale (INFINITY)*, 5 years, \$1,675,000 • **Kevin Sheth**, **Mark Alberts**, **Karen Furie**, University of Cincinnati (NIH), *Southern New England Partnership in Stroke Research, Innovation and Treatment (SPIRIT)*, 5 years, \$1,670,705 • **Brian Shuch**, **Ranjit Bindra**, The Hope Foundation, *Identification and Characterization of Oncometabolite-induced DNA Repair Defects in Sporadic Papillary Kidney Cancer*, 1 year, \$200,000 • **Dena Simmons**, Charlotte-Mecklenburg Schools Board of Education, *Charlotte NC RULER Training*, 1 year, \$340,826; EdAdvance, *EdAdvance RULER Training*, 1 year, \$160,500; Oakland Schools, *Oakland Schools Service Agreement*, 1 year, \$23,000 • **Matthew Simon**, Ono Pharma Foundation, *Disulfide Tethering to Discover Small-Molecule Ligands for RNAs Across the Mammalian Transcriptome*, 1 year, \$172,500 • **Jonathan Siner**, North-Shore University HealthSystem (NIH), *A Novel Data Science and Network Analysis Approach to Quantifying Facilitators and Barriers of Low Tidal Volume Ventilation in an International Consortium of Medical Centers*, 1.7 years, \$157,303 • **Courtney Smith**, Pharmaceutical Research & Manufacturers of America (PhRMA) Foundation, *Understanding the Molecular Mechanism of TIM3 Signaling*, 2 years, \$40,000 • **Erica Spatz**, Baystate Medical Center (NIH), *Identifying Effective Strategies Used by Medicare Accountable Care Organizations to Improve Outcomes for Patients With Heart Failure: A Mixed-Methods Study*, 3.8 years, \$340,764 • **Donna Spiegelman**, Harvard School of Public Health (NIH), *The Moderate Alcohol and Cardiovascular Health Trial (Harvard Biostatistical and Biospecimen Core)*, 1 year, \$10,362 • **Serena Spudich**, Henry M. Jackson Foundation for the Advancement of Military Medicine (DoD), *Study of NeuroHIV Cure Consortium (Protocols Is: R 254, RV397, RV398, RV405, RV412)*, 1 year, \$211,050; University of California, Los Angeles (NIH), *AIDS Clinical Trials Group (ACTG)*, 2 years, \$6,206 • **Derek Steinbacher**, Medical Device Business Services, *Educational Grant Fellowship*, 1 year, \$52,638; DePuy Synthes, *Educational Grant Clinical Fellowship*, 1 year, \$21,000 • **Mario Strazzabosco**, PSC Partners Seeking a Cure, *Upregulation of Biliary Epithelia Innate Immune Responses in PSC*, 1.3 years, \$32,384 • **Stephen Strittmatter**, Dr. Ralph and Marian Falk Medical Research Trust Bank of America, N.A., Trustee, *Fyn Kinase Inhibition for Tauopathy in Dementia and Glaucoma*, 2 years, \$1,000,000 • **Scott Strobel**, Howard Hughes Medical Institute, *Building Bridges for Inclusive Excellence*, 2.1 years, \$49,600 • **Xiaolei Su**, Andrew McDonough B+ Foundation, *Mechanism of Chimeric Antigen Receptor Activation in Pediatric Cancer Immunotherapy*, 2 years, \$150,000; Charles H. Hood Foundation, Inc., Boston, MA, *Mechanism of Chimeric Antigen Receptor Activation in Cancer Immunotherapy*, 2 years, \$165,000 • **Amrita Sule**, American Association for Cancer Research, *Targeting Oncometabolite-producing Cancers with DNA Repair Inhibitors*, 3 years, \$225,000 • **Tami Sullivan**, University of Texas Health Science Center at San Antonio (NIH), *Daily Dynamics and Long-term Trajectories of Elder Abuse and Neglect in Family Caregiving*, 1.7 years, \$60,183

Huanxing Sun, American Thoracic Society, *Mitochondrial DNA and Fibroblasts in SSC-ILD*, 1 year, \$40,000 • **Jakub Toczek**, American Heart Association, *Molecular Imaging of Phagocytic Activity in Abdominal Aortic*

Aneurysm, 2 years, \$114,368 • **Richard Torres**, Applikate Technologies (NIH), *New Instrument and Methods for Fast, Diagnostic-Quality Histology of Un-embedded Bone Marrow and Lymph Node Specimens*, 1 year, \$37,999

Mariam Totonchy, American Society for Dermatologic Surgery, *Defining Perineural Invasion in Cutaneous Squamous Cell Carcinoma*, 8 months, \$6,900 • **Jeffrey Townsend**, Society for Molecular Biology & Evolution, *SMBE Satellite Workshop Proposal*, 1 year, \$35,800

Amelia Trant, Diva International, *Understanding Access to Menstrual Products in New Haven: Patient Interviews*, 2 years, \$1,000

Kathi Traugh, **Elaine O'Keefe**, Boston University (DHHS), *New England Public Health Training Center*, 4 years, \$500,000 • **Jasmine Travers**, University of Pennsylvania (NIH), *Center for Improving CAre Delivery for the Aging (CICADA)*, 1.3 years, \$35,641 • **Marietta Vazquez**, Brigham and Women's Hospital (DHHS), *Reducing the Morbidity and Mortality Due to Acute Febrile Illnesses in Central America and the Dominican Republic*, 1 year, \$37,965 • **Arjun Venkatesh**, American College of Emergency Physicians (ACEP), *ACEP CEDR Measure Validation (2017 Dataset)*, 6 months, \$51,210 • **Merceditas Villanueva**, New Haven, CT, City of New Haven (DHHS), *Ryan White Part A HIV/AIDS Service Continuum*, 1 year, \$1,465,277 • **Chantal Vogels**, Netherlands Organisation for Scientific Research, *Impact of Zika Virus Evolution on Transmission Potential by Mosquitoes*, 2 years, \$151,766

Fred Volkmar, The Nancy Taylor Foundation for Chronic Diseases, *Diagnostic Stability and Early Childhood Predictors of Outcome in Autism Spectrum Disorders*, 1 year, \$108,000

Jacob Wallace, Harvard Medical School, *The Impact of Medicaid Plans on Access to and Quality of SUD Treatment*, 2.8 years, \$12,951

Emily Wang, Columbia University, *Rikers Island Longitudinal Study*, 1 year, \$50,000; San Francisco Public Health Foundation, *Expanding the TCN Network in California*, 2.6 years, \$391,824 • **Samuel Wilkinson**, American Foundation for Suicide Prevention, *Effects of Electroconvulsive Therapy on Suicide Attempts in Geriatric Patients with Depression*, 2 years, \$84,706 • **Francis Wilson**, Johns Hopkins University (NIH), *AKI Matched Phenotype Linked Evaluation with Tissue (AMPLE-Tissue)*, 1 year, \$51,963 • **Adam Wisniewski**, American Chemistry Council, *Glutathione Conjugates of Aliphatic Polyisocyanates: Generation and Characterization In Vitro*, 1 year, \$81,868 • **Ambrose Wong**, Society for Academic Emergency Medicine, *Well-Being and Mistreatment of Sexual and Gender Minority Medical Students*, 1 year, \$3,000 • **Yinyu Wu**, American Heart Association, *MicroRNA-223 Regulation of Hemogenic Endothelial Cell Specification via N-glycosylation*, 2 years, \$53,688 • **Ke Xu**, Research Triangle Institute (NIH), *Genomic or Nucleomic Information to Understand HIV Latency in Individuals with Substance Use Disorders*, 1.7 years, \$381,540 • **Henry Yaggi**, Johns Hopkins University (NIH), *Sleep Apnea Treatment with Positive Airway Pressure for Prevention of Diabetes Mellitus*, 11 months, \$19,690 • **Qin Yan**, Breast Cancer Alliance, *Targeting KDM5B Histone Demethylase to Boost Antitumor Immune Response in Breast Cancer*, 1 year, \$100,000 • **Chongguang Yang**, Robert E. Leet and Clara Guthrie Patterson Trust, Bank of America, N.A., Trustee, *The Role of Internal Migration in the Transmission Dynamics of Multidrug-resistant Tuberculosis in Urban China*, 2 years, \$90,000

Sarah Yip, Brain & Behavior Research Foundation (formerly NARSAD), *Neuromarkers of Opioid Relapse in Chronic Pain*, 2 years, \$69,212 • **Bryan Young**, Foundation for Sarcoidosis Research, *Novel Biomarkers and Tracers for Sarcoid Disease Activity*, 2 years, \$250,000 • **Heping Zhang**, University of Colorado Denver (NIH), *The Clinical Research/ Reproductive Scientist Training Program (CREST)*, 1.7 years, \$108,831 • **Yalan Zhang**, National Ataxia Foundation, *Investigating the Molecular Mechanism of Neurodegeneration in Spinocerebellar Ataxia Type 13*, 1 year, \$50,000 • **Hang Zhou**, Brain & Behavior Research Foundation (formerly NARSAD), *Identifying Genetic Risks for Comorbid Major Depression and Substance Use Disorders by Large-Scale Whole Exome Sequencing*, 2 years, \$70,000 • **Melissa Zhou**, Consortium of Multiple Sclerosis Centers, *Outcomes Following a First Clinical Event in Children with the Radiologically Isolated Syndrome*, 8 months, \$5,000 • **Xin Zhou**, Harvard School of Public Health (NIH), *Trial of Vitamin D Supplementation to Prevent TB Infection in Schoolchildren*, 1.5 years, \$20,125

Andrey Zinchuk, Parker B. Francis Foundation, *Novel physiologic predictors of adherence to Positive Airway Pressure: NICEPAP*, 3 years, \$192,450

Child Study Center brings clinical care under one roof

Former telephone company building, once foreboding, is now bright and welcoming

The Yale Child Study Center (CSC) has dedicated a new behavioral health care facility at 350 George Street in New Haven that puts its clinical and community-based operations all under one roof, and provides a bright space that is being warmly praised as a welcoming place for young patients and their families.

The building's work areas, 53,000 square feet total, are more than triple the combined space of CSC's three prior facilities, which were on York and Temple Streets and on South Frontage Road. Linda C. Mayes, MD, Arnold Gesell Professor of Child Psychiatry, Pediatrics, and Psychology, and chair of the CSC, says the larger size is just one of its advantages. "Before, our families had to come to different sites. A family might go to one building, and then they would have to come all the way to another building," she explains.

We also have room for growth. And we bring programs together that heretofore did not have the opportunity to collaborate."

At the official ribbon-cutting on October 4, Robert J. Alpern, MD, dean and Ensign Professor of Medicine, said the building is a space transformed. He recalled first seeing it a few years ago, "when it was a building that the telephone company used for phone lines and it had no windows and it looked like a bunker." Now there are large windows on all sides, along with original artwork, books donated by Scholastic Publishing, plus well-placed lighting and other architectural touches by the firm of Svigals + Partners that enhance the quality of the care being delivered. "This will really be the home that the Child Study Center has always deserved," Alpern proclaimed.

Marna Borgstrom, CEO of Yale New Haven Health, celebrated the opening as one more example of the seamlessness of care between the hospital system and the School of Medicine. "Our patients see us as one organization, and Linda [Mayes] has been key to helping to lead this transformation for the entire medical center," Borgstrom said. "We owe her incredible gratitude because I don't think we would be here without her."

The children of New Haven and nearby communities will be very well served, said New Haven Mayor Toni Harp. "The children who come here deserve space that lets them know that you respect them, that you have high expectations, and that they're going to be better because they came here."

"You stood up for the principle long before it became fashionable, that given the chance every child

in America can learn and succeed," added U.S. Representative Rosa DeLauro. "That is what you will continue to do at this facility."

Mayes says it is great to see the excited look on children's faces as they walk through the doors of the new space. "That's why we did it. I feel that's what makes it worthwhile," she says. "I think it's the respect they feel by the beauty of it. It doesn't feel traditionally medical. It feels welcoming and caring."

Erin Warnick, PhD, associate research scientist and CSC's lead of clinical operations, organized the planning effort for what was a massive project. "We imagined, how could we build a space that really supports the work that we're doing for our community?" Warnick said at the ribbon-cutting. "Thank you across the board to all the members of our community who contributed big ideas, little ideas. As you walk through the space, you can see that all of these ideas were incorporated into the plans because each of them made a difference and each of those contributions serves to create what this space really is today."

Approximately 225 people will work in the new facility, including physicians, psychologists, social workers, pediatricians, and staff. The building will also be home to the Center for Emotional Intelligence, which previously occupied space on Edwards Street, as well as all of the Child Study Center's in-home programs, the MOMS Partnership, and Elevate, a policy lab. The Yale Child Study Center receives approximately 60,000 patient visits each year. CSC's research operations and administration remain at 230 South Frontage Road.



ROBERT A. LISAK

The Yale Child Study Center has consolidated its clinical and community-based operations, formerly divided among several New Haven locations, into a single building at 350 George Street. With modern lighting and other innovative design features, the new facility has been praised as especially welcoming for young patients and their families. Dean Robert Alpern praises it as "the home that the Child Study Center has always deserved."

"Clinicians and scholars in those different sites had fewer opportunities to interact with and learn from one another. Bringing everyone together in one space allows them to work together more effectively. It's giving patients one door to come through.

// **Autoimmune** (page 1) and technology to alleviate autoimmune disorders, improving lives of patients and families.

"Finding the keys to autoimmune disease is one of the most vexing challenges in science," say the Coltons. "It would do so much for humankind to uncover its causes, and ultimately to develop effective treatments. We think that Joe Craft and his Yale colleagues are uniquely equipped to do this work, and that the Colton Center will be a perfect vehicle through which to succeed."

The new center's mission is to identify and support innovative, high-impact research projects with the potential for translation into therapies. To nurture the advancement of early-stage discoveries, the center will support the proof-of-concept and validation studies that are crucial in transforming novel ideas into treatments, devices, and cures.

Craft will work closely with an advisory committee composed of experts in autoimmunity research from Yale as well as other academic institutions and members of the pharmaceutical industry and

venture capital firms, to evaluate proposals from Yale's many schools and academic disciplines.

Craft and the committee will select and monitor unique, well-defined projects that show the most promise, making awards in two categories: pilot grants for exploratory and proof-of-concept activities; and development grants for more firmly grounded projects. Development grants may be extensions of successful pilot grants, or other new projects with great potential.

To ensure an appropriate breadth of proposals for these awards, the center will also evaluate and potentially support ideas that are submitted to other funding sources at Yale that are dedicated to promoting biomedical innovation. A yearly symposium will bring together investigators, donors, philanthropic advisors, advisory committee members, and Yale leadership to review the progress of funded projects.

Craft is well positioned to lead the center. Autoimmune disease has been the focus of his work, both clinically and in the lab. He trained in rheumatology and immunology

at Yale and joined the faculty in 1985, where he runs a laboratory devoted to the study of immunological diseases, with particular attention to SLE. He also served as section chief of rheumatology until 2018, when he stepped down to focus on his research.

He has been captivated by the complexities of autoimmune disease since medical school. "As a first-year student, the first patient I ever saw had lupus," he says. "I've thought about that for years—how we could have understood more about her disease and provided better treatment."

As international leaders in immunology and autoimmunity research, Yale scientists have made many important discoveries that advance understanding of immune system dysfunction. The new center will encourage cross-disciplinary, investigator-initiated research, actively bridging the gaps between research and application. It will provide strategic resources to ensure that research with commercial relevance does not stall due to lack of funding.

"We're looking for really novel ideas, and sometimes novel ideas

beg for support," says Craft. "The Coltons' vision and generous gift will enable us to provide that support to move forward ideas that show real promise."

"The new center will have a substantial, broad impact on the Department of Immunobiology, enabling exciting new ideas to be tested and accelerating the development of potential new therapeutics for autoimmune diseases," adds David Schatz, PhD, chair and Waldemar Von Zedtwitz Professor of Immunobiology, and professor of molecular biophysics and biochemistry. "We are particularly excited by the opportunity to merge basic and translational research to benefit patients."

"Throughout the School of Medicine, there has long been an emphasis on understanding immunological diseases and thinking creatively about autoimmune disease to find new treatments," says Robert J. Alpern, MD, dean and Ensign Professor of Medicine. "This center will accelerate our efforts, with the promise of improving the quality of life for millions who suffer from autoimmune diseases."

Palliative care receives recognition and a professorship

Kapo's work highlights the importance of easing pain and discomfort of illness

When Jennifer Kapo, MD, arrived at Yale in 2012, palliative care was widely considered an afterthought, a therapy reserved for terminally ill patients who had exhausted both options and hope. After she became inaugural chief of the Yale Palliative Care Program and the Yale New Haven Hospital Palliative Care Service, Kapo built the program from a four-person unit that received roughly 300 consults per year into a service that has received national renown. Her interprofessional team now consists of 30 people, including two social workers and two chaplains, and other professionals including an art therapist.

All deliver the essence of what palliative care is—a specialized form of medical care focused on relieving the symptoms and stress of a serious illness. It is appropriate at any age and at any stage, and one can receive it along with curative treatment. The goal is to improve the patient's quality of life. Today, Kapo's program treats more than 3,000 new patients per year at 13 sites across Connecticut.

Among the patients Kapo cared for at Yale were Sherwin B. Nuland, MD '55, and Michael K. Vlock. These men would serve as the inspiration for Yale's first endowed professorship for palliative medicine, a position to which Kapo was appointed in April of this year.

Nuland, known as Shep by those who were closest to him, was a professor of surgery at Yale School of Medicine and also was a best-selling author and bioethicist. In addition to mentoring medical students, he taught a freshman history of medicine seminar at Yale College. Nuland's book *How We Die: Reflections on Life's Final Chapter*, winner of the 1994 National Book Award, candidly demystified, organ by organ, the process of dying and challenged the American health care system's bullish obsession with

fighting death. During the last year of his life as he battled prostate cancer, Nuland received palliative care from Kapo and her team.

"Having been with Shep in all that was going on, I was used to being in the clinic, and it's one of the most dehumanizing places in the world," says Sarah Nuland, his widow. "Jen Kapo came into the room, and the temperature changed. She was warm, kind, thoughtful. And she didn't look at the computer. She looked into the eyes of my husband."

As he wished, Nuland died in his home in Hamden on March 3, 2014. Inspired by Kapo and seeking a way to commemorate her husband, Sarah Nuland decided to start the Nuland Foundation, a nonprofit dedicated to advancing palliative care's role in health care and to educating underserved communities about it. Emblazoned as the organization's motto are words she had found scribbled into an advance print edition of *How We Die*, tucked away beside her husband's chipped pine writing desk: "The purpose of the art of medicine is not primarily to cure disease or to fight death, but to relieve human suffering."

One of Sarah Nuland's chief goals for the foundation was to establish an endowed professorship of palliative medicine at Yale. She approached many of her close friends for funding. One was Karen Pritzker, a local philanthropist and investor. Pritzker and her husband Michael Vlock had previously supported Yale New Haven Hospital's neonatal intensive care unit, as well as other organizations including Teach for America and the Michael J. Fox Foundation for Parkinson's Research. Pritzker and Vlock discussed Nuland's request, and agreed they should contribute.

Nuland's cause soon became personal to them. In early 2017, Vlock was diagnosed with mesothelioma and began a treatment plan at a hospital in New York. Seeing her husband's vitality fading from the brutal intensity of the treatment, Pritzker sought out Sarah Nuland for advice. Nuland

gave her Kapo's number, and Vlock was brought back to New Haven, where Kapo cared for him until his death on September 29, 2017.

"Anyone who knew Michael knew he was an individual person and had his own way of doing things," Pritzker said. "Jen met him where he was and helped us navigate that phase." Inspired by the impact of palliative medicine on her husband's final weeks of life, Pritzker decided in June 2018 to expand her initial gift and endow the professorship.

On a warm-winded June 25, 2019, some 150 people from across the Yale community, including the families and friends of Kapo, Nuland, and Vlock, gathered under the dark timber beams of the Harvey Cushing/John Hay Whitney Yale Medical Historical Library to celebrate the establishment of the Sherwin B. Nuland and Michael K. Vlock Professorship of Palliative Medicine.

Robert J. Alpern, MD, dean and Ensign Professor of Medicine, warmly remembered the two men, recalling Nuland's strong-willed commitment to medicine and Vlock's dedication to the New Haven community. He also commended Kapo for expanding and strengthening Yale's palliative care program. "It is Jen's clinical excellence that really helped to inspire the gift today," he said.

It was within the cancer program at Yale New Haven Hospital that the Palliative Care Program began in 2007. Charles S. Fuchs, MD, MPH, Richard Sackler and Jonathan Sackler Professor of Medicine (Medical Oncology), director of Yale Cancer Center, and physician-in-chief of Smilow Cancer Hospital, said, "Today's celebration recognizes the fundamental

principle of patient-centered care as a foundation of medicine. I would suggest to you that few fields exemplify patient-centered care better than palliative medicine."

The event's keynote speaker, Diane E. Meier, MD, a geriatrician at Mount Sinai Health System in New York and founder/director of the nationally recognized Center to Advance Palliative Care, stressed the



At a ceremony celebrating the establishment of the Sherwin B. Nuland and Michael K. Vlock Professorship of Palliative Medicine, the chair's inaugural occupant, Jennifer Kapo, stands between donors Sarah Nuland (left) and Karen Pritzker.

importance of training physicians in palliative medicine and applauded Yale's efforts. "This is a commitment from Yale School of Medicine to say this is a core part of the practice of medicine and health care. It is as important as the management of hypertension or diabetes."

For Kapo, the professorship is a mark of legitimacy for palliative care at Yale. "We will be able to think about palliative care as woven into the fabric of the standard of care that we provide for all patients," she said. "It's not just a specialty to which we refer patients when there's nothing left to do, but rather one that's truly integrated throughout the courses of all serious illness."

"There is a lot of work to do to meet that goal," she cautioned. "But with this endowed chair, we'll be able to work toward that."

// **Dean** (page 1) 13 academic divisions, thrived. In addition to increasing the number of faculty by almost 30% during her tenure as chair, she recruited eight division directors, including four women, and increased the proportion of trainees and faculty from groups traditionally underrepresented in medicine.

She expanded mentorship resources for trainees and faculty immersed in research and established a career development program for faculty focused on clinical care. Research funding overall in the department increased by 56% and funding from the National Institutes of Health (NIH) went up by 47%. Clinical activities also experienced an upswing, with outpatient visits growing by 59% and admissions by 25%.

An interest in how things work sparked Brown's desire to study

medicine during her undergraduate days at Yale. "You follow your questions where they take you," she says of her decision to specialize in clinical pharmacology. Her curiosity about the renin-angiotensin-aldosterone system, which regulates blood pressure, led to discoveries on how that system affects glucose homeostasis as well as fibrinolysis (the breakdown of fibrin clots that result from coagulation); the cardiovascular and renal effects of ACE inhibitors and other drugs used to control blood pressure; and the mechanisms of angioedema (a swelling under the skin or mucous membranes). Her research program has been continuously funded by the NIH since 1993. On the clinical side, she has had a long career treating patients with resistant hypertension, including those with such secondary causes of the condition as adrenal tumors and renal vascular disease.

Brown's appointment followed an extensive search initiated by President Peter Salovey, PhD '86, that was undertaken by a committee chaired by Lynn Cooley, PhD, dean of the Graduate School of Arts and Sciences, C.N.H. Long Professor of Genetics, and professor of cell biology and of molecular, cellular, and developmental biology; and composed of diverse faculty and representatives from across the School of Medicine, the university, and Yale New Haven Health. "It was clear to me from the search committee that the members are passionate about making Yale a better place," Brown says.

As to why she set her sights on becoming dean, Brown says: "Many people have given to me in my career. Medicine faces a number of challenges that I would like to help address." As a physician-scientist,

Brown is well aware of the pressures of pursuing increasingly competitive grant funding and the growing demands and financial pressure of providing clinical care, which she believes have affected the way medical students and residents are trained. Her vision is to "return joy to the work of academic medicine."

Although still in what she terms the "early stages of the diagnostics" at Yale, she would like to explore opportunities to develop physician-scientists who bridge discovery and patient care, grow the medical school's research portfolio in support of the university's strategic plan for science, and focus on improving the work climate at YSM, which will be an early priority. "I think we need to stick to some fundamental values and goals," she says, "and that requires creativity to do within the current constraints."

Strobel is appointed provost of Yale University

Longtime medical school faculty member will oversee Yale academics and budget

Scott A. Strobel, PhD, Henry Ford II Professor of Molecular Biophysics and Biochemistry and a Howard Hughes Medical Institute investigator, has been named the university's next provost, effective January 1. The provost is Yale's chief academic and budgetary officer.

"From chairing the University Science Strategy Committee to leading the development of the Poorvu Center for Teaching and Learning, Scott has been an integral part of our efforts to realize the university's mission of research, scholarship, education, preservation, and practice," President Peter Salovey, PhD '86, wrote Nov. 6 in a campus-wide email announcing the appointment.

He has served as chair of the Department of Molecular Biophysics and Biochemistry (2006-2009), vice president for West Campus planning and program development (2011-2019), deputy provost for teaching and learning (2014-2019), and vice provost for science initiatives (2019).

Through these roles, Salovey wrote, "Scott has developed a profound appreciation for all parts of Yale's academic enterprise: arts, humanities, social science, and sciences and engineering. He has worked closely with the professional schools and the FAS [Faculty of Arts & Sciences]. He has partnered with faculty from across the university



DAN RENZETTI

... and worked tirelessly in support of our students. As provost, his academic and budgetary leadership will extend to every part of Yale."

Strobel earned his PhD from the California Institute of Technology under Peter Dervan, PhD '72. He pursued postdoctoral research at the University of Colorado with Thomas Cech, PhD, who shared the 1989 Nobel Prize in Chemistry with Yale Professor Sidney Altman, PhD.

Since joining the Yale faculty in 1995, Strobel has won awards for promoting undergraduate education, mentoring graduate students, and leading research programs at the intersection of chemistry and structural biology.

Strobel succeeds Ben Polak, PhD, the provost since 2013. Polak, the William C. Brainard Professor of Economics and professor of management, will return to the faculty full time.

"It's a special honor to be offered this role," Strobel said, "and I'm

grateful to President Salovey for the trust he places in me to help shape and shepherd Yale's ambitious agenda. This university is on sure footing thanks to him and to Ben Polak, who has been a remarkable example of integrity, discipline, commitment, and strategic acumen. I've benefitted from his example, and I'm honored to succeed him.

"Yale has long epitomized intellectual teamwork," he continued. "The academic priorities we're pursuing together are as interdependent as they are distinct, and that's by design: The world calls for people and approaches that break boundaries to improve the world. I look forward to supporting our amazing faculty in the full expression of that work."

Scott Strobel is Yale University's incoming provost. In his more than 20 years at the university, he has led such top-level initiatives as the University Science Strategy Committee, which he chaired.

Horwich is 2020 Co-recipient of Breakthrough Prize



ARTHUR HORWICH

Arthur L. Horwich, MD, and colleague F. Ulrich Hartl, MD, from the Max Planck Institute, will share a \$3 million Breakthrough Prize, the richest prize in the sciences.

Horwich, Sterling Professor of Genetics at Yale School of Medicine and an investigator at the Howard Hughes Medical Institute, and Hartl, director of the Max Planck Institute of Biochemistry, are honored for their work describing the molecular machinery that folds proteins into proper shapes within cells.

Proteins must be folded into proper three-dimensional structure to carry out their functions, which are crucial to all life. The scientists have shown this folding inside cells does not occur spontaneously, as previously believed, but depends upon molecular "assistants" called chaperones. The misfolding of proteins has been implicated in Alzheimer's, Parkinson's, Huntington's, and other neurodegenerative diseases.

Horwich and Hartl have won numerous awards for describing the molecular basis of protein folding, including the prestigious Albert Lasker Basic Research Award.

The Breakthrough Prize annually recognizes achievements in the life sciences, fundamental physics, and mathematics, disciplines that "ask the biggest questions and seek the deepest explanations."

National Academy of Medicine elects six new members from Yale

Basic science, clinical care, and public health are all represented by the honorees

Six School of Medicine faculty members have been elected to the National Academy of Medicine (NAM), the organization announced Oct. 21 at its annual meeting.

They are among 100 new members elected by NAM to receive the honor, which recognizes individuals who have demonstrated outstanding professional achievement and commitment to service in the fields of health and medicine.

At a ceremony on Oct. 22 to celebrate the winners, Robert J. Alpern, MD, dean and Ensign Professor of Medicine, said those who receive this honor are the best of the best. "For every one person that gets in, there are 10 outstanding people who don't get elected that year. So, the competition is incredible, and I think it is a real honor when somebody gets elected to the National Academy of Medicine."

Established originally as the Institute of Medicine in 1970 by the National Academy of Sciences, NAM addresses important issues in health, science, medicine, and related policy and inspires positive actions across sectors. NAM works alongside the National Academy of Sciences and

National Academy of Engineering to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions.

YALE HONOREES:

- **Nita Ahuja**, MD, chair and William H. Carmalt Professor of Surgery, and chief of surgery at Yale New Haven Hospital. Ahuja is internationally recognized for her expertise in gastrointestinal cancers, including gastric, rectal, and pancreatic cancers and for being a passionate advocate for mentorship of trainees, staff, and faculty. Ahuja is also a leader in translational epigenetics, and initiating clinical trials in colorectal cancer, pancreatic cancer, and other solid tumors. In addition, she has developed biomarkers for early detection of colorectal and pancreatic cancers.
- **Jorge E. Galán**, PhD, chair and Lucille P. Markey Professor of Microbial Pathogenesis and professor of cell biology. Galán studies the molecular mechanisms of pathogenesis of *Salmonella* and *Campylobacter*, which cause the majority of food-borne illnesses in the world. His lab uses a multidisciplinary approach to study the interface between pathogen and host. He discovered that such bacteria as *Salmonella* use a needle-like complex

of more than 30 proteins to infect and replicate within host cells.

- **Akiko Iwasaki**, PhD, Waldemar Von Zedtwitz Professor of Immunobiology, professor of molecular, cellular and developmental biology, professor of dermatology, and Howard Hughes Medical Institute investigator. Iwasaki's research focuses on the mechanisms of immune defense against viruses at the mucosal surfaces. Her laboratory is interested in how innate recognition of viral infections leads to the generation of adaptive immunity, and how adaptive immunity protects against subsequent viral challenge. She recently showed that a new vaccine strategy can provide preventive and therapeutic protection against viral infections.
- **Rafael Pérez-Escamilla**, PhD, professor of public health (social and behavioral sciences), director of the Office of Public Health Practice, and director of the Global Health Concentration at the Yale School of Public Health. Pérez-Escamilla has launched public health nutrition and food security research programs around the world, which have been credited with the improvement of many measurements of health including breastfeeding outcomes and iron-deficiency anemia in infants. His health disparities research has focused on the impact of community health workers in improving behavioral and



ANTHONY DECARLO

At a ceremony celebrating their selection to the National Academy of Medicine, (l-r): Nita Ahuja, Rafael Pérez-Escamilla, Akiko Iwasaki, Jorge Galán, and Nenad Sestan. Absent from photo: David Schatz.

metabolic outcomes among Latinos with type 2 diabetes.

- **David G. Schatz**, PhD, chair and Waldemar Von Zedtwitz Professor of Immunobiology, and professor of molecular biophysics and biochemistry. Schatz has made fundamental contributions to our understanding of the mechanisms that assemble and diversify the genes that encode antibodies and T cell receptors.
- **Nenad Sestan**, MD, PhD, Harvey and Kate Cushing Professor of Neuroscience, professor of comparative medicine and of genetics and psychiatry, as well as executive director of the Genome Editing Center. Sestan studies the molecular and cellular basis of brain development, exploring how neurons acquire distinct identities and form proper synaptic connections in the cerebral cortex, a part of the brain that is essential for cognition, perception, and behavior.