**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 3,500 trainees, has continued to grow. A 2016 investigative report by The Wall Street Journal recognized Vanderbilt’s success in developing and retaining young researchers.

**Gift launches Yale autoimmunity center**

The Colton Center’s mission is to identify and nurture basic researchers 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, 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, therapeutics, and new preventive strategies.

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.

**A new pathology chair is named, will arrive in March**

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, Liu joined the faculty at Inner Mongolia Medical University, where he later became chair of the Department of Pathology. From 2009 to 2015, he was professor and chair of the Department of Pathology at the Inner Mongolia Medical University, where he also served as a professor of pathology at Inner Mongolia Medical College.

**Inside This Issue**

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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.
Care when a child has a sudden need

Karen Santucci

Karen Santucci has been 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 TGIIFF—Team Gathering Innova-tives/space planning, and support 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.

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 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.

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 cen-tral hub for interdisciplinary col-laboration on Science Hill, is de-signated 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, cellu-lar, and developmental biology; and of molecular biophysics and biochemistry.

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

“Building this is critically 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 Com-mittee. “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 envis-ion today.”

For two and a half 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,” adds President Peter Salovey, PhD ’86.

Medicine@Yale

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Karen Santucci has been a career of treating young patients when her patients may need her most. Here 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.
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 Medicine announced to the 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. The architecture envision’s Generations as a benefit to both the clinic and the laboratory. Its 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. “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 or diseases. 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 notes that the information collected there indicates that heighten 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 was why Murray joined Yale. For instance, effective therapies do not yet exist for Alzheimer’s, volunteer donors will get no information on their risk for that. “We can’t 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 plot 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 missing 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 assistant 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 are diagnosed with a disease don’t become ill. “I think a big question is why some people with the same mutation get a disease and others don’t,” says Antonio Giraldes, 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 a disease, you never 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 cardiology 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, Ed- ward J. Miller, MD, PhD, associate professor of medicine and radiology, and Nikolaus Papoutsakis MD, PhD, instructor of medicine (cardiovascular medicine), are developing new methods of investigating how the condi- tions 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 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” Giraldes 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 irre-versible 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.” Genetic analysis may also help clinicians customize medication regimens. Rebecca Pulik, PharmD, clinical coordi- nator 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 dihydropridimine dehydroge- nase. Fluorouracil, a chemotherapy used in GI and breast malignancies, relies entirely on this enzyme for degradation. 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 Giraldes, 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.”

DNA sequencing to guide research, care

Headway is made on averting renal cysts

Yale researchers have discovered how the polycystin 2 (PC2) gene affects 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 mito- chondria, 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 tissue that resulted from the seeding of the cells, and seeded the decellularized tissue that resulted from the seeding of 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 ex- hibited thecontractile defects of HCM. To test the hypothesis, the team may have triggered the hypercontractility in the healthy heart cells, the authors suggest. Future work will investigate how the ECM affects contractility, Campbell says.
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.

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) Dollichio (left), and David Nam, both Class of 2022, pose with Waypoint, a photograph they arranged together.

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.

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.

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 pompons and a cardboard cutout of Handsome Dan. 3. A panel of alumni shared their experiences in personal career advancement.

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, Predrag and Dragania 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.

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 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 tick-borne disease research at Yale, led 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 oxides that tick saliva contains, essentially by stymying 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 expanding Lyme disease spreads 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 response. 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 injects antibodies and poisons with saliva, a tick’s bite is a much longer process. If a person is bitten, it takes a tick up to 48 hours after biting before introducing Borrelia into the host. That delay gives researchers 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 impedes infection with Borrelia.

The 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 don’t carry Borrelia seem to acquire some protection from the parasites over time. “Many would 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 for 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.”

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 tick-borne 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.

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 keep- ing 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 last year in Science Translational Medicine.

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

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Microenvironment Effects on the Immune Response in Liver Cancer. Treated with TACE, 2018-2019, National Cancer Institute (NCI), 2.7 years, $217,786

Sarah Clausen, University of California, San Francisco (UCSF), 2018-2020, 2 years, $133,681

Anaplasma phagocytophilum Strains During Tuberculosis Treatment, 2017-2018, National Institute of Allergy and Infectious Diseases (NIAID), 1 year, $100,000

Robert Holford, University of California, San Francisco (UCSF), 2017-2019, 2 years, $70,000

Robert King, Rutgers, The State University of New Jersey, 2017-2020, 3 years, $152,660

Iryna Kolosova, American Association for the Study of Lung Cancer, 2017-2019, 2 years, $75,000

Steven Kleiman, Duke University (NIH), 8 Cell Receptor Repertoire Sequencing Data Analysis, 9 months, $30,050

Albert Ko, Massachusetts Institute of Technology (MIT), 2016-2018, 2.7-10.017 years, $13,048

Jonathan Koff, Duke University (NIH), 2016-2018, 2 years, $13,360

Kurt Kind, University of North Carolina at Chapel Hill (UNC), 2016-2018, 2 years, $13,360

Erica Spatz, Texas A&M University System Biomedical Engineering Center (TGen) (NIH), 2016-2018, 2 years, $100,000

Kerel Lium, PKD Foundation for Research in Polycystic Kidney Disease, 2016-2018, 2 years, $60,000

Ravi Shankar, University of California, Los Angeles (UCLA), 2016-2018, 2 years, $76,107

Karin Hartsell-Dowen, Emory University, 2016-2017, 1.8 years, $59,895

Marc Gerstein, University of Chicago, 2016-2017, 1.7 years, $157,995

Brett Haffty, University of Pennsylvania, 2016-2017, 1.5 years, $100,000

Arija Dutta, University of Puerto Rico en Cayey, 2016-2017, 1 year, $33,000

David Gill, University of Minnesota, 2016-2017, 1 year, $40,000

Alicia Little, 2016-2017, 1 year, $20,000

Rebecca Kamody, Mayo Clinic, 2016-2017, 1 year, $37,491

Nicholas Schaefer, 2016-2017, 1 year, $17,493

Rebecca Khoo, 2016-2017, 1 year, $27,158

Paula Seidler, University of Massachusetts, 2016-2017, 1 year, $34,247

Iryna Ko, American Health Association, 2016-2017, 1 year, $71,935

Erol Fikrig, Stanford University, 2016-2017, 1 year, $70,000

James Duncan, Denis Sukhodolsky, Rutgers University, 2016-2017, 1 year, $88,607

Leslie Baum, 2016-2017, 1 year, $83,600

David Levine, University of Michigan, 2016-2017, 1 year, $83,600

Kathleen Lunney, University of California, Los Angeles (UCLA), 2016-2017, 1 year, $80,000

Anna Medland, 2016-2017, 1 year, $272,128

Sofia Rokos-Macior, 2016-2017, 1 year, $272,128

Joy Kaufman, Rockefeller University, 2016-2017, 1 year, $21,384

Carlos Grilo, University of Puerto Rico en Cayey, 2016-2017, 1 year, $22,384

Shilpa Hattingh, Washington University in St. Louis (NIH), 2016-2018, 2 years, $100,000

Katherine Friedland, National Institute on Drug Abuse (NIDA), 2016-2018, 2 years, $100,000

Margaret Trevor, 2016-2018, 2 years, $71,935

Pauline Prediger, 2016-2018, 2 years, $66,055

Suzanne momentarily lost her way. At the crossroads, she decided to turn left. Her path led her to a small village nestled among the mountains. The villagers welcomed her with open arms, sharing stories of their lives and the beauty of their land. Suzanne found solace in their simple existence and the natural beauty around her. She spent weeks exploring the village and the surrounding landscapes, immersing herself in the culture and the environment. This experience left a profound impact on her, inspiring her to pursue a new path in her career. As she returned to her life in the city, Suzanne carried with her a renewed sense of purpose and a deep appreciation for the simple things in life. She knew that her journey was just beginning, and she was eager to embark on the next chapter with a clear mind and heart.
of Synaptic Density in Autism Spectrum Disorder, 2 years, $70,000 • Linda Mayes. The Irving Institute for Clinical and Translational Science and Relationship to Infant Mental Health Community, 3 years, $345,000; Boston Children's Hospital, Investigating the Development and Maturation of Mental Health, 1 year, $40,798 Adam Mecca. American Brain Foundation, Investigating the Role of Microbiome Embedded in Art and Potential Impact of Risk of Antipsychotic Use in Hospitalized Elderly with Dementia, 1 year, $16,951 • David Pitt. Vanderbilt University School of Medicine, Well Medical College of New York (NYS), No-Go MRi for Monitoring Disease Status in Multiple Sclerosis, 3 years, $195,000. Joan van den Berg. University of Minnesota, Exploring the Role of Neuropeptides in Control of Appetite in Selective Eating, 1 year, $12,442 • Kelly Pollit. University of Massachusetts Amherst, Public Health Assessment of PTEN Mutations and Infection to Reveal Tolerant in SLE, 3 years, $52,704 • Saral Mehta. Medical Device Busi-ness Innovation Center, Identification and Characterization of New Settings at the University of North Carolina at Chapel Hill (NIH), Environment, Epigenetics, Neurodevelopment & Health, 2 months, $3,410 • Erica Meffre. Lusus Research Alliance (formerly, Alliance for Lusus Research), PTTPM: A Database of tRNA Dependent Inhibition to Reduce Tolerant in SLE, 3 years, $52,704 • Michael M. Narayanan, E. Madhia Ziegler Foundation for the Blind, The University of New Mexico, New Mexico, Study of New Clinical Settings and Cortical Organization, 3 years, $345,000. Candice Paulsen, University of British Columbia, Simons Academy of Sciences, Assistance in Management of USAID’s Partnerships with NGL and Relationships with Partnerships (PEER Health), 1 year, $19,099 Emily Majchrzak, New York University Langone Medical Center, and Adolescent Psychiatry, Pilot Study Investigating the Role of De Novo Genetic Variants in the Development of Autism Spectrum Disorder, 1 year, $14,638 • Yi-Yi Tachanki, Rutgers, the State University of New Jersey (New Brunswick), Rutgers University, Mechanisms of Antigen-Presenting and MHC-I Differences between Ethnic Adults in Brazil, 1 year, $38,200 • Chao He. Harvard Medical School, University of Minnesota, Role of Social and Emotional Interactions in the Development of Young English Language Learners, 2 years, $63,775 • Robert R. Brem, Breast Cancer Research Foundation, Targeting the Cell Cycle in Breast Cancer, 1 year, $250,000 • Johns Hopkins Univer- sity (NIH), PD-1/PD-1: Modulation in Cancer Immunotherapy, 1 year, $250,000 • Robert R. Brem, University of Minnesota (DOD). Mechanisms of Resistance to immunotherapy in Osteosarcoma, 2 years, $25,785 • Robert R. Brem, University of Minne- sota, Novel Immunotherapy for Sarcoma using Vaccines: OX40 and NKG2D Ligands, 1 year, $14,800 • Super Soko, 1 year, $40,798 • Ralph J. and Marian Falk Medical Research Trust Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda- tion, Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda- tion, Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda- tion, Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda- tion, Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda- tion, Bank of America, N.A., Trustee, Robert E. Leet and Clara Guthrie Patterson Founda-
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 Edward and Hazel Schack 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 kind of foreboding. 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 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 we will continue to do at this facility.”

Mayes says it is great to see the excited look on children’s faces as they step into 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.”

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 combined 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.

// 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,” says Colton, “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 Foundation will be a critical 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 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 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 national 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 also 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 Waldehra and Albert C. Zetsis Jr. 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 Colton, MD, dean and Ruth W. and A. Alfred 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 in the wake of a state-of-the-art Palliative Care Service, Kapo built the program from a four-person unit that received roughly 300 consultations per year into a service that has received national renown. Her interdisciplinary 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 offers — the understanding 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, 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 by 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 biochemist. 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 Moments at Yale College*, was a freshman history of medicine semi-plenary on the first day of classes, and he 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 collaborate. Pritzker and Vlock, gathered under the dark timber beams of the Harvey Cashin and 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 the 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 the Yale Cancer Center, and physician-in-chief of Smilow Cancer Hospital, said, “Today’s celebration recognizes the fundamental 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.”

Kapo’s work highlights the importance of easing pain and discomfort of illness during the last year of 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. Embazoned as the foundation’s mission statement was, “To use the humanitarian arts to form a new relationship with the experience of the dying.”

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As the 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 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.”

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As to why she set her sights on 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 fibrolysis (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 1992. “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 were passionate about making Yale a better place,” Brown says.

Looking to why she chose 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 Poore 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 … 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 projects 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 benefited 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.”

Horwich is 2020 Co-recipient of Breakthrough Prize

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 structures 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 day. 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 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.

As 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.