

Children, families to benefit doubly from Child Study Center gifts

A focus on enhancing parents' well-being to better prepare them to care for their children

When parents seek mental health services for their children, they may be ill equipped to choose the most effective approach. Even after they have obtained professional help for a child, they may not realize how valuable it can be to receive care for themselves, both for their own well-being and to help them better address the child's needs.

Spurred by personal experiences, Lynne Singer Redleaf and her husband, Andrew Redleaf, a 1978



A gift from Andrew Redleaf and Lynne Singer Redleaf lets the Child Study Center focus new attention on the well-being of parents as they care for special needs children.

graduate of Yale College, wanted to directly contribute to a program dedicated to these challenges.

Lynne recalls that as she raised a son who had emotional and behavioral challenges, finding support services near her home in // **Parents** (page 5)

Turning innovative ideas into practical therapies and better access to needed care

The Yale Child Study Center (CSC) has a distinguished history of applying scholarship and research to the clinical needs of children in New Haven and Connecticut. Famously, 25 years ago, the center launched a program that encouraged New Haven child mental health professionals and police officers to intervene on behalf of children and families exposed to severe trauma.

The initiative, called the Child Development-Community Policing Program (CD-CP), was so successful that



A gift from the Viola W. Bernard Foundation to the medical school's Child Study Center will further Bernard's vision of turning theory into effective mental health delivery. With the Center's director Linda C. Mayes (center) are the Foundation's treasurer Cary Koplin (left) and its vice president and founder Joan Wofford, a niece of Bernard.

it caught the attention of a pioneering psychiatrist, Viola W. Bernard, M.D., who tirelessly advocated for practical solutions for child well-being and health. After her // **CD-CP** (page 5)

Addiction pioneer recognized with professorship

Leader of Connecticut-based vaccine maker endows chair for chief of internal medicine

As executive chair and head of global business development at Meriden, Conn.-based Protein Sciences, Dan Adams develops and manufactures vaccines. The School of Medicine's Patrick G. O'Connor, M.D., M.P.H., chief of general internal medicine, works to improve treatment for addiction in primary care settings, where help may be most accessible. The two men share a commitment to the mission statement of Protein Sciences, which reads in part: "To save lives and improve health by effectively responding to the changing world."

This past spring, in recognition of that common vision, O'Connor was named the first Dan Adams and Amanda Adams Professor of General Medicine. Dan Adams, a former member of the School of Medicine's Dean's Council, created the professorship with a substantial endowment.

The endowment honors Amanda Adams, who is Dan Adams' daughter,



Dean Robert J. Alpern (left) hosted a gathering honoring Patrick G. O'Connor (right) as inaugural recipient of an endowed professorship named for Dan Adams and his daughter Amanda Adams (second and third from right). O'Connor researches innovative ways to treat addiction in primary care and internal medicine settings.

senior vice president and assistant general counsel at Citicorp, and a 1997 graduate of Yale College.

O'Connor's research focuses on the interfaces among general internal medicine, primary care, and addiction. "His internationally renowned work has already made a tremendous difference in how drug and alcohol addictions are treated," says Robert J. Alpern, M.D., dean and Ensign Professor of Medicine. "Office-based treatment with buprenorphine is now the most common form of therapy for

opioid addiction. That rests solidly on Patrick's research."

O'Connor conducted the first randomized clinical trial of buprenorphine for the treatment of opioid dependence in primary care, published in the *American Journal of Medicine* in 1997. He has conducted numerous National Institutes of Health (NIH) clinical trials, including a randomized trial of naltrexone for the treatment of alcohol dependence using a primary care-based management // **Professorship** (page 8)

Four new leaders to helm medical school departments

Four departments at Yale School of Medicine have new leaders. They are Lucian V. Del Priore, M.D., PH.D., of ophthalmology and visual science; Gary V. Desir, M.D., of internal medicine; Linda C. Mayes, M.D., of the Child Study Center; and David G. Schatz, PH.D., of immunobiology.

Lucian V. Del Priore became chair of the Department of Ophthalmology and Visual Science and chief of Ophthalmology at Yale New Haven Hospital (YNHH) on July 1. He was recruited from the Medical University of South Carolina, where he had led the ophthalmology department as the Pierre G. Jenkins Chair and directed the Storm Eye Institute. Del Priore, the Robert R. Young Professor of Ophthalmology and Visual Science, specializes in retinal diseases, glaucoma, and vitreoretinal surgery. He helped facilitate the first clinical trial using stem cells to treat patients with Stargardt macular dystrophy and age-related macular degeneration.

In 1982, he received his M.D. with distinction in research from the University of // **Chairs** (page 4)



Alison P. Galvani

Alison P. Galvani, the youngest person ever appointed to an endowed professorship at the medical school, has combined technology with the power of mathematics to predict patterns of deadly infectious disease. Galvani's work has changed the trajectory of disease treatment and prevention.

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The ecology of disease

From the flu to Ebola, predicting and then stifling pathogens' spread

Alison P. Galvani, PH.D., the Burnett and Stender Families Professor of Epidemiology, has devoted her research career to tracking diseases, and to transforming data into predictive maps and practical policy recommendations. So distinguished is her body of work that in 2015, at age 38, Galvani became the youngest-ever appointee to an endowed professorship at the School of Medicine.

When Galvani was just 5 years old, growing up in San Francisco, her mother—a clinical psychologist—died. According to Galvani, her grief instilled in her an abiding passion for helping the downtrodden and orphaned.

When she was in high school, a copy of Richard Dawkins' book *The Blind Watchmaker* sparked her interest in evolutionary biology. Galvani took it upon herself to write a letter to Dawkins challenging some of his premises and outlining some of her own ideas about evolutionary processes. Dawkins praised Galvani in his reply and encouraged her to apply to the University of Oxford for an undergraduate degree in biology.

Galvani not only took his advice, but remained at Oxford to pursue a doctorate under theoretical biologist

Robert May. Following a postdoctoral fellowship at the University of California, Berkeley, she came to Yale as a junior faculty member. By that time her pioneering work in behavioral epidemiology—how human behavior leads to and affects disease transmission—was well underway. "I'm fascinated by the power of mathematics to contribute in very practical ways to the benefit of society," she says.

Galvani's team at Yale has conducted international investigations into the transmission of HIV, influenza, Ebola, and Zika, among other pathogens. "We are most interested in projects that have the potential to improve policy and save lives," she says. Her work on influenza and rotavirus has led to concrete policy changes and made vaccination programs in Israel and the United Kingdom more cost effective.

Galvani established the Center for Infectious Disease Modeling and Analysis (CIDMA) within the School of Public Health in 2014, shortly before the Ebola epidemic hit western Africa. When it did, she offered her team's help in understanding the disease's dynamics to Liberia's health ministry, which welcomed the aid. Galvani and her colleagues worked tirelessly to generate models to capture the level of virus in patients, the patients' survival outcomes, and the social behavior of affected families, all of which formed

the basis for effective ways to stem the epidemic. Their predictions of the impact of combined interventions—published in the journal *Science*—forecast trajectories of the epidemic in Liberia with remarkable accuracy.

Galvani's team also developed a smartphone app to track the location of symptomatic patients. Previously, with only pencil and paper to do that job, the arrival of ambulances had been delayed by as much as several days. With resources in Liberia severely limited, CIDMA contributed more than 30 computers and phones to the Ebola response team so that the mobile application could function. Patients received hospital care far more rapidly, improving recovery rates and curtailing further transmission.

Galvani has received numerous honors including the Blavatnik Award for Young Scientists from the New York Academy of Sciences, the Bellman Prize, and a Guggenheim Fellowship.

Throughout her career, as she has managed students and postdocs, and raised three children in a home that also includes a dog and a full chicken coop, Galvani has continued to apply the lessons of evolutionary biology that she first learned from Dawkins. "The same principles of ecology and species conservation apply, but in reverse," she says. "In disease systems, we want to drive the parasite species extinct."

Pathologist named director of tumor profiling lab



Janina Longtine

Janina A. Longtine, M.D., has been appointed vice chair of pathology and laboratory medicine and director of molecular and genomic diagnostics at Yale

School of Medicine and director of the Tumor Profiling Laboratory at Smilow Cancer Hospital.

Throughout her 30-year career, Longtine has developed deep expertise in molecular pathology. In her new role, she plans to integrate patient management and individualized cancer care with tumor profiling services. Longtine will work with the departments of pathology and laboratory medicine, in addition to the Center for Genome Analysis at West Campus, to foster integration across molecular diagnostic services within the medical school.

Longtine came to Yale this past spring from Icahn School of Medicine at Mount Sinai in New York where she was tenured professor and vice chair of molecular pathology and genetics. Before joining Mount Sinai in 2011, Longtine held multiple appointments at Brigham and Women's Hospital and Dana-Farber Cancer Institute and was associate professor of pathology at Harvard Medical School.

She studied molecular biology at Wellesley College and earned her M.D. in 1981 from the University of Massachusetts Medical School. Longtine completed her residency in anatomic pathology and a clinical fellowship in hematopathology at Brigham and Women's Hospital. In addition, she completed two research fellowships in molecular biology at Children's Hospital Boston and Brigham and Women's Hospital.

Pediatrician recognized for clinical excellence in neonatology

Matthew J. Bizzarro, M.D., associate professor of pediatrics and medical director of Yale New Haven Children's Hospital's Neonatal Intensive Care Unit (NICU), is the 2016 recipient of the David J. Leffell Prize for Clinical Excellence. The prize is given to individuals who demonstrate the highest level of clinical expertise, commitment to teaching, and compassion for patients.

At a ceremony at the Sterling Hall of Medicine, Bizzarro said, "It was difficult to think I've been singled out given the quality of the [neonatology] group. I would challenge anyone to find a better group of clinicians."

After attending medical school at the University of Medicine and Dentistry of New Jersey, Bizzarro completed his residency at New York University Medical Center and joined Yale as a fellow in 2002.

Bizzarro said at the ceremony that he felt drawn to pediatrics and critical care as a medical student but discovered his true passion in caring for sick newborns at Yale. "Watching babies you've spent months taking care of go home with their families is an overwhelming feeling," he said.

The Leffell Prize was created in 2008 with a gift from David J. Leffell, M.D., the David P. Smith Professor



Neonatologist Matthew J. Bizzarro (rear, second from left), seen with members of his family, has been honored for the excellence of his clinical work.

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of Dermatology and professor of surgery, and his wife, Cindy, in honor of Leffell's 30th Yale College reunion. It includes a monetary award and a framed citation to be displayed in the Sterling Hall of Medicine.

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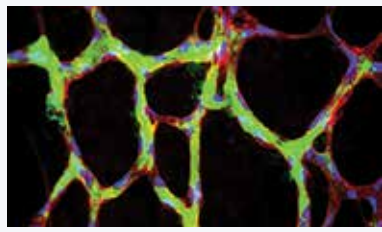
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Molecule plays main role in cell crosstalk



HYUNG J. CHUN, M.D.

Blood vessels form through a complex series of interactions among cells called “crosstalk.” Researchers led by Hyung J. Chun, M.D., associate professor of medicine, have identified a crucial player in the process: a tiny RNA molecule known as miR-139-5p. The researchers studied mice that lacked either the gene *apelin* (*APLN*) or its receptor (*APLNR*), and found the retinal vasculature of these mice to be severely underdeveloped. They also found in the blood vessels of these mice that the expression of a related gene that directs a distinct set of cellular signaling, known as *CXCR4*, was aberrantly increased. The crosstalk between these molecules was mediated by miR-139-5p, which controls expression of *CXCR4* and is essential for normal vascular development.

The finding demonstrates a novel mechanism by which interdependence between signaling pathways is established in the developing blood vessels. The findings, published April 12 in *Nature Communications*, have implications for conditions including heart disease, cancer, and blinding diseases of the retina.

Why flu is deadly among the elderly

There’s good reason behind doctors’ recommendation that older adults receive the flu vaccine annually. Each year, 90 percent of deaths worldwide related to influenza A virus (IAV) strike men and women aged 65 and older. The trouble, according to a widely accepted theory, is that IAV replicates quickly and overwhelms older adults’ immune systems, thus making them more susceptible to catching pneumonia and the like.

A study published in April in the journal *Science* suggests that the body’s inflammatory immune response, not the virus, leads to death. Akiko Iwasaki, Ph.D., Waldemar Von Zedtwitz Professor of Immunobiology and an investigator of the Howard Hughes Medical Institute, and colleagues found that immune cells from older adults secrete significantly less interferon, a key antiviral protein.

The authors then created mice with immune systems that mimicked this weakened response. “Although the virus was not sufficient to kill mice, the immune response, driven by neutrophils [white blood cells], led to excessive inflammation and lung damage,” says lead author Padmini S. Pillai, a doctoral student in Iwasaki’s lab.

The study could point to new anti-inflammation flu treatments that target and calm this overactive immune response.

New center boosts big-data research

From training to hardware to hands-on help with data, the Yale Center for Research Computing gives investigators an added edge

As big data becomes integral to many academic disciplines, research universities have found a need to upgrade both the technologies they use and the skill sets of research professionals who must organize and analyze the data. It was this need that motivated the creation of the Yale Center for Research Computing (YCRC) in 2015, says Kiran Keshav, E.M.S., the center’s executive director, and senior director of research technologies at Yale University.

The YCRC provides Yale researchers a resource for complex computing support. Located on Yale’s Science Hill, the center provides the cyber-infrastructure researchers need to do their work and guidance on how to maintain the infrastructure. It also provides education and training, such as programming. Before the center’s creation, Keshav says, support for computational research was decentralized. “One of the first things I wanted to do was to collocate all the staff. All the people who were effectively doing research computing support for faculty needed to be together,” he says. “Now it’s the start of a community. We’re building a one-stop shop for technology-related support for research.” The YCRC has supported researchers in numerous ways. Alan Anticevic, Ph.D., assistant professor of psychiatry and psychology, uses computational methods combined with imaging techniques to better understand the mechanisms underlying such psychiatric illnesses as schizophrenia and addiction. Where today clinicians diagnose these illnesses using qualitative measures such as behavior, Anticevic predicts that one day they will be able to diagnose with far more precision by measuring associated brain mechanisms. He has used the high-performance computing resources at the YCRC to investigate these dysfunctional brain circuits.

The YCRC has also helped to acquire new super-computing technology for Yale researchers. Robert Bjornson, Ph.D., senior research scientist in Yale’s Department of Computer Science and a member of the YCRC staff, recently assisted the Yale Center for Genome Analysis in securing a grant from the National Institutes of Health to replace an old high-performance computing cluster. The newly purchased cluster went online this spring, bringing an additional two petabytes of storage and a great deal more computing power for genome analysis. The new cluster was named Ruddle, after the late Francis H. (“Frank”) Ruddle, a School of Medicine scientist who famously pioneered genetic engineering.

These clusters are used by people such as Mark B. Gerstein, Ph.D., the Albert L. Williams Professor of Biomedical Informatics, who is working to identify the function of particular regions of the human genome. As sequencing the human genome becomes increasingly accessible, researchers are using the technology to better understand disease. Structural changes along the genome are prevalent in genomic diseases such as cancer.

“People in genomics were using big data before it was cool,” says Gerstein, who also is professor of molecular biophysics and biochemistry and of computer science. As a genomic researcher, Gerstein needs to handle very large datasets and organize the data in a way that will provide meaningful insights in medicine. He says that research computing support should be separate from a general information technology department, and is glad to work with the YCRC.

“Configuring the hardware, knowing what to get, doing everything correctly in relation to federal grants and contracts—that takes quite a bit of effort on the part of everyone. The YCRC are the point people to help get those things working,” says Gerstein.

Genomics may be an obvious beneficiary of the resources at the YCRC, but research in fields such as biomedical engineering also depends on the center’s computation

resources. Jay D. Humphrey, Ph.D., the John C. Malone Professor of Biomedical Engineering, is interested in understanding how blood flows through the complex vasculatures of patients with abdominal aneurysms. Using patient-specific images of aneurysms, Paolo Di Achille, a doctoral candidate in Humphrey’s lab, creates computer models that can predict where a blood clot will form within an aneurysm. This work could help clinicians decide whether or not to intervene when a patient has an aneurysm and there is risk that a blood clot will form.

Humphrey’s team uses the supercomputers available through the YCRC, such as the clusters “Omega” and “Grace.” They also use clusters in such places as Texas and San Diego through a National Science Foundation-funded consortium called Extreme Science and Engineering Discovery Environment. Di Achille first learned how to use supercomputers through a YCRC-run workshop. “Having [the supercomputers] here and having some practice on them allows me to quickly adapt the workflow to clusters somewhere else,” he says.

Humphrey’s research on blood clots and abdominal aneurysms is “computationally expensive”—meaning it requires large amounts of computing power. He notes the

At right, Kiran Keshav (center) talks with Andrew Sherman (left) and Robert Bjornson. Below, members of the Yale Center for Research Computing and Yale’s Information Technology Services Research Technologies staff.



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value of having a center on campus dedicated to research computing support. “It’s more than just maintaining hardware or having the right software available,” he says. “It’s really about understanding what’s needed to do state-of-the-art computation and enabling the people who use the facility to be able to do it in an efficient way.”

Medical students should also be prepared to deal with the era of big data, according to the co-chair of the center’s faculty advisory committee, Harlan M. Krumholz, M.D., S.M., the Harold H. Hines Jr. Professor of Medicine and professor of investigative medicine and of public health. “With medicine, this [data] is the next big thing. We think discoveries are going to be accelerated by our better use of digital data.”

Krumholz says the old approach of memorizing risk factors to categorize patients may be on its way out. “I think we’re going to move toward taking all the information about you and be able to see how it affects your risk and response to disease and treatment—being able to personalize our approach in ways doctors could never memorize.”

The center isn’t just for the people who want to be more computer savvy in research, Krumholz says. “This center should be an organizing force. I think we will have been successful if this kind of training becomes an integral part to every different part of the university.”

Keshav and his colleagues hope to expand the YCRC’s training opportunities and continue hosting events. For now, the center continues to provide support to the growing need for technological support in research.

OUT & ABOUT

March 19 A **Donate Life America** charity event styled after the popular “Dancing with the Stars” television show. **1. Margaret J. “Peggy” Bia**, M.D., professor of medicine in nephrology, danced with her husband, **Frank J. Bia**, M.D., M.P.H., professor emeritus of medicine in infectious diseases, while engaging in friendly competition against colleagues. **2. Gary V. Desir**, M.D., chair of internal medicine and professor of medicine and his wife, **Deborah Desir**, M.D., a rheumatologist in the New Haven community.



ROBERT LISAK (2)



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April 19 A lecture sponsored by the **Association of Yale Alumni in Medicine**. **1. Fred Aslan**, M.D. '02, M.B.A., founder and chief executive officer of Adavium Medical, described various ways that M.D. or PH.D. degrees can contribute to careers in business. **2.** Medical student **Jonathan Park** listened from the audience.



HAROLD SHAPIRO

May 19 The Class of 2016 celebrated 75 percent participation in its **Graduating Class Gift** campaign benefiting financial aid. Leadership included class co-presidents (left to right) **Mona Guo**, M.D. '16; **Richard Kayne**, M.D. '76, the Association of Yale Alumni in Medicine president; and **Joel Winer**, M.D. '16, M.H.S. '16.

May 23 At **Commencement**, Anthony S. Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases at the National Institutes of Health, addressed the graduating class. **1. Michael Chang** showed his pleasure for the camera. **2.** From left, **Vikram Jairam**, **Raj Chovatiya**, **Chang-Yeon Kim**, **Matthew Mikhail**, and **Benjamin Lerner**. **3.** From left, **Veronica Shi**, **Xiaoyue Mona Guo**, **Vinay Rathi** and **Connie Cheng** wait. **4. Bethlehem Mekonnen** and **Lise Nadine Tchouta** walk together from main campus to the medical school's graduation ceremony.



JOHN CURTIS



JOHN CURTIS



JOHN CURTIS



ROBERT LISAK (3)



June 3-4 Alumni and friends participated in **Reunion Weekend** events. **1.** Medical student **Robert Rock** led an art observation educational session at Yale University Art Gallery. **2.** Attendees **Heather Yun**, M.D. '01 and her son, **Theo Yun**; listened to **Tiffany Moadel**, M.D., director of medical student simulation at the Yale Center for Medical Simulation (in white coat), as **Kathleen Figaro**, M.D. '96, looked on. **3.** At a panel, **Joel Winer**, M.D. '16, M.H.S. '16, and **Rebecca Vitale**, M.D. '15, M.H.S. '16, answered questions with **Robert M. Rohrbaugh**, M.D. '82, professor of psychiatry and director of the Office of International Medical Student Education. **4.** Members of the **Class of 1981**.

// **Chairs** (from page 1) Rochester School of Medicine and Dentistry and then earned a PH.D. in physics at Cornell University. Del Priore completed an internal medicine internship at the Greater Baltimore Medical Center in 1984, followed by a residency in ophthalmology and fellowships in vitreoretinal surgery and glaucoma at the Wilmer Eye Institute at Johns Hopkins University School of Medicine. He succeeds interim chair Ron Adelman, M.D., professor of ophthalmology and visual science, and director of the Retina and Macula Center.

Gary V. Desir has been named chair of the Department of Internal Medicine after serving as interim chair since 2013. He is the Paul B. Beeson Professor of Medicine in the section of nephrology, and also is YNHH's chief of internal medicine. He serves as board chair for Yale Medicine, the medical school's recently renamed faculty clinical practice, and holds a secondary appointment at Yale's School of Forestry and Environmental Studies.

Desir immigrated from Haiti to the United States after high school. He earned his M.D. from Yale School of Medicine and completed his training in internal medicine and nephrology at YNHH before joining the medical school's faculty, where he has served as chief of nephrology and chief of medicine at the VA Connecticut Healthcare System.



Lucian Del Priore



Gary Desir

As a physician-scientist, Desir has contributed significantly to understanding mechanisms that regulate body weight and insulin sensitivity. He has delineated the mechanism by which reninase, a growth factor he discovered, protects cells from ischemic and toxic injury, and shown that dysregulated reninase signaling can promote the survival of cancer cells.

A champion of diversity and social justice, Desir is a co-founder of the Minority Organization for Retention and Expansion, a faculty group focused on increasing faculty diversity through mentoring programs and developing social networks.

After a career at Yale spanning nearly three decades, **Linda C. Mayes** has been appointed director of the Child Study Center and chief of child psychiatry at Yale New Haven Children's Hospital. Mayes is the Arnold Gesell Professor of Child Psychiatry, Pediatrics, and Psychology, and serves as Special Advisor to the Dean.



David Schatz



Linda Mayes

Mayes, who is trained as a pediatrician, neonatologist, and adult and child psychoanalyst, earned her M.D. at Vanderbilt University School of Medicine in Nashville. She completed her pediatric internship, pediatric residency, and neonatology fellowship at Vanderbilt before joining Yale in 1985.

Mayes's research focuses on the stress-response and regulatory mechanisms in young children at both biological and psychosocial risk and the long-term impact of chronic stress and adversity on children's health and development. She integrates perspectives from psychophysiology, neurobiology, child development, and behavioral neuroscience.

Mayes served as interim chair after Fred Volkmar, M.D., the Irving B. Harris Professor in the Child Study Center and professor of psychology, stepped down as chair.

The incoming Department of Immunobiology chair, **David G. Schatz**, is already an established leader

within the department, having served as vice-chair. Schatz is Waldemar Von Zedtwitz Professor of Immunobiology and a professor of molecular biophysics and biochemistry, and has been a Howard Hughes Medical Institute Investigator since 1991.

He has made fundamental contributions to the field's understanding of the mechanisms that assemble and diversify the antigen receptor genes that encode antibodies and T cell receptors. Schatz may be best known for the discovery of *RAG1* and *RAG2*, subsequent biochemical insights into RAG function and evolutionary origins, and important insights into the regulation of somatic hypermutation.

He received B.S. and M.S. degrees in molecular biophysics and biochemistry from Yale. As a Rhodes Scholar, Schatz studied at Oxford University for two years, earning a B.A. degree in philosophy and politics in 1982. He subsequently entered the graduate program in the biology department at the Massachusetts Institute of Technology, performing his thesis research with Nobel Laureate David Baltimore, PH.D., at the Whitehead Institute for Biomedical Research and receiving his PH.D. degree in 1990.

In assuming his new role as chair, Schatz succeeds Richard A. Flavell, PH.D., Sterling Professor of Immunobiology, who became founding chair of the department in 1988.

Investigating genes' on/off switches



Humans have up to 25,000 protein-coding genes. DNA methylation, which occurs when methyl groups are added to DNA, plays a crucial role in which genes get turned on or off. Methyl groups alter a chromosome, but not the DNA sequence itself. For decades, scientists thought a methyl group could bond only to cytosine—one of DNA's four bases.

Andrew Xiao, PH.D., associate professor of genetics, and his team reported in *Nature* that methylation occurs on another DNA base: adenine. Xiao investigated how this methyl bond interacts with a specific transposon, which is an ancient virus that invaded our genome long ago and now serves to control gene expression, especially on X chromosomes.

"We know transposons are helpful because they can freely jump to different parts of the chromosome, thus allowing our DNA to modify to different environmental factors," Xiao said. Since these transposons are also found in cancer cells, perhaps this type of DNA methylation could be a target for cancer, Xiao said.

How a gene thwarts cancer defenses

A Yale-led study describes how a known cancer gene, *EGFR*, silences genes that typically suppress tumors. The finding, published in *Cell Reports*, may lead to the development of more effective, individualized treatment for patients with lung cancer and other cancer types.

Mutations in the *EGFR* gene are linked to multiple cancer types, including cancers of the lung, brain, and breast. Yet scientists did not know precisely how *EGFR* represses genes that prevent cancers. The Yale team conducted multiple experiments and found that *EGFR* silences tumor suppressor genes in lung cancer and glioblastoma, a type of brain cancer.

"*EGFR* can target multiple unrelated tumor suppressor genes in different cancer types using a common mechanism," said senior author Narendra Wajapeyee, assistant professor of pathology and a member of Yale Cancer Center. *EGFR* silences these genes by negatively regulating a protein called *TET1*, which is required to suppress tumors, he noted.

The finding informs the future direction of research and treatment of patients who don't respond or develop resistance to drugs that inhibit *EGFR*, he said. "It will also help determine how effective cancer therapies will be against different *EGFR* mutations."

A 'far-reaching' federal grant is renewed

Beneficiaries of the five-year award include junior faculty poised to conduct clinical and translational investigations

The School of Medicine has received \$53.6 million from the National Center for Advancing Translational Sciences to renew its five-year Clinical and Translational Science Award (CTSA) to accelerate research discoveries that can have a positive impact on health.

This is the second renewal for Yale, which was among the first 12 institutions nationally to receive CTSA funding when the National Institutes of Health (NIH) started the program in 2006. The award supports the Yale Center for Clinical Investigation (YCCI), established in 2005 as part of the medical school's strategic plan to develop an infrastructure to support research and educate the next generation of investigators.

"We've made incredible strides under the CTSA in establishing a robust infrastructure and resources for investigators," says Robert J. Alpern, M.D., dean and Ensign Professor of Medicine. "I am delighted that CTSA support will allow us to continue to expand our research enterprise to support the acceleration of treatments from the bench to the bedside."

CTSA hubs are expected to streamline the research process to get studies up and running more quickly; collaborate with one another; and, with community providers, patients, and industry, to use tools and resources to their best advantage; to promote team science; and develop effective ways of improving the recruitment and retention of clinical trial participants.

Educating tomorrow's clinician scientists is also a top priority under the CTSA. "I am very proud of the success of our educational programs to train medical students, physicians, postdoctoral fellows and junior faculty," says Robert S. Sherwin, M.D., principal investigator of the CTSA, director of YCCI and the C.N.H. Long Professor of Medicine (endocrinology). "Continuing these efforts under the CTSA

is a critical part of our mission that will have far-reaching impact going forward."

Scholars and trainees interested in pursuing translational research have been drawn from a range of disciplines across Yale's Schools of Medicine, Nursing, and Public Health, and from the Department of Biomedical Engineering at the School of Engineering and Applied Science. Under the renewal, Yale has expanded the number of slots in its TL-1 Multidisciplinary Pre-Doctoral Training Program in



Robert S. Sherwin (left) and Dean Robert J. Alpern say a five-year renewal of the federally funded Clinical and Translational Science Award promises to spur new research by the most junior members of Yale School of Medicine's faculty.

Translational Research from 10 to 20, the maximum number allowed. The KL-2 Mentored Clinical Scholars Program is also expanding from seven partially funded scholars to nine.

During the next five years, YCCI will also pursue new partnerships to develop and market therapeutics that address unmet clinical needs. In addition, with a goal of making funded research especially robust, YCCI will encourage investigators to tap into Yale New Haven Health's database of more than 4 million electronic health records, which reflect a large and diverse patient population. Support from CTSA continues to help transform Yale into a "learning health system" that generates innovative strategies for disease prevention, diagnostics, and therapeutics.

// **Parents** (from page 1) Minnesota was endlessly frustrating. "I have health insurance, I have connections, I have intellectual resources," she says. "And yet I had a lot of trouble finding help for my son." Lynne wanted other families to have an easier path.

So, this year the Redleaves gave \$10 million to the medical school's Child Study Center (CSC) to support the launch of its Parent and Family Development Program (PFDP). Established in March, the PFDP is a collaborative hub of integrated clinical services for parents across disciplines and departments, including child and adult psychiatry, pediatrics, perinatal medicine,

psychology, genetics, neurobiology, and neuroimaging.

During a visit to Yale, the Redleaves met with CSC researchers and learned about *Minding the Baby*, a collaboration between Yale and the city of New Haven that brings together home visiting teams to promote physical and mental health, and improved attachment outcomes in babies, mothers, and their families.

The PFDP focuses on the adult transition to parenthood and provides services that address parents' needs, says Linda C. Mayes, M.D., the Arnold Gesell Professor of Child Psychiatry, Pediatrics, and Psychology and director of the CSC. "We bring together

services that are specifically for parents, focusing on how their needs are met, with the understanding that that in turn facilitates meeting the child's needs," Mayes says.

Through PFDP, parents are able to receive job skills training and educational opportunities, and to learn skills that can help them build healthier social interactions. By coordinating these efforts, the center allows parents to obtain comprehensive care in one place.

Mayes and Megan V. Smith, PH.D., M.P.H., assistant professor of psychiatry, are co-directors of the PFDP. Both will be involved with academic research intended to inform the program's methods and demonstrate its efficacy.

// **CD-CP** (from page 1) death in 1998, the Viola W. Bernard Foundation gave \$100,000 to help the Child Study Center continue the CD-CP.

This past spring, the Foundation made an endowed gift of \$2.35 million to establish the Viola W. Bernard Fund for Innovation in Mental Health Care. The fund serves three purposes: to provide a fellowship in social justice and health care equity for mental health professional trainees; to award a prize for innovation in child mental health care delivery to a mental health professional working in

partnership with a professional from another discipline; and to fund an annual lecture series addressing social justice and health care equity topics. The endowment leaves CSC better positioned both to create and research new delivery models and to improve access to mental health care for children and their families.

"Our foundation is very confident that we have found the perfect vehicle to perpetuate the mission of the Bernard Foundation and of what Viola wanted and gave 60 years of her life toward," says board member and

treasurer Cary A. Koplin, a graduate of the Yale College Class of 1966.

According to the Foundation, its namesake psychiatrist had little patience for ideas that could not be applied in real world situations. "Viola really took a multidisciplinary, multi-faceted approach to complex problems," says Joan Wofford, M.A.T. '59, Bernard's niece and the Foundation's vice president.

"She did not want to just write a check to feed children," Koplin adds, drawing a distinction between help with temporary benefits and more lasting solutions. "She wanted to create replicable programs."

Grants and contracts awarded to Yale School of Medicine

July 2015–November 2015

Federal

Clara Abraham, NIH, *Mechanisms Regulating Innate Immune Responses*, 1 year, \$416,250
Frederick Altice, NIH, *Prison Interventions and HIV Prevention Collaboration*, 5 years, \$3,318,630
Meenakshisundaram Ananthanarayanan, Jittima Weerachayaphorn, Michael Nathanson, NIH, *Regulation of Cholestasis by Inositol Trisphosphate Receptors*, 1 year, \$245,760 • **Karen Anderson**, DoD, *Exploring APOBEC 3B as a Novel Target for Squamous Cell Lung Cancer*, 1 year, \$166,500
Deborah Ayeni, NIH, *Modulation of the Immune System as a Strategy to Treat EGFR Mutant Lung Adenocarcinoma*, 2 years, \$55,536 • **Byoung-II Bae**, NIH, *Molecular Control of Brain Size*, 1.4 years, \$417,787 • **Nigel Bamford**, NIH, *Dopamine-Induced Striatal Synaptic Plasticity*, 4.5 years, \$1,762,940
Susan Baserga, NIH, *Predocortical Program in Cellular and Molecular Biology*, 5 years, \$6,842,040; NIH, *Key Factors in Human Ribosome Biogenesis*, 3.7 years, \$1,578,269 • **Joerg Bewersdorf**, NIH, *An Integrated Imaging System for High-Throughput Nanoscopy of the 4D Nucleome*, 2.8 years, \$990,000 • **Linda Bockenstedt**, NIH, *Borrelia Miyamotoi Infection in Mice and Humans*, 1 year, \$670,392 • **Jonathan Bogan**, NIH, *Vesicle Translocation and the Metabolic Syndrome*, 4 years, \$1,498,500 • **Angelique Bordey**, NIH, *Cortical Tuber and Epilepsy*, 2 years, \$459,375 • **Clemente Britto-Leon**, NIH, *sPLUNC1 and Neutrophilic Inflammation in Cystic Fibrosis*, 4.7 years, \$694,575
Martina Brueckner, NIH, *Genetics and Genomics of Congenital Heart Disease and Associated Neurodevelopmental Abnormalities*, 5 years, \$2,358,063; NIH, *Intracellular Calcium Directs Cardiac Left-Right Asymmetry*, 4 years, \$2,341,984
Richard Bucala, NIH, *Aging and Innate Immune Mechanisms in Pulmonary Infection*, 4 years, \$1,665,000 • **Matthew Burg**, NIH, *PTSD, Sleep, and Risk for Incident Hypertension*, 3.7 years, \$3,205,335 • **Cecilia Canessa**, NIH, *Probing ASIC1 Function In Vivo Using Novel Genetic Tools*, 1.9 years, \$457,875 • **Michael Caplan**, NIH, *Pathways and Partners in Renal Epithelial Cell Polarity*, 4.4 years, \$1,498,500 • **Sandy Chang**, NIH, *Telomere Dysfunction and Genome Instability in Familial Melanoma*, 2 years, \$400,110; NIH, *Telomere Dysfunction Induced Breast Cancer Pathogenesis*, 5 years, \$1,914,446 • **William Chang**, NIH, *Investigating Endothelial Cell and Glomerular Anastomoses to Advance Kidney Tissue Engineering*, 3.9 years, \$766,104 • **Keith Choate**, NIH, *Genetics and Pathobiology of Disorders of Keratinization*, 4.9 years, \$2,398,083 • **Jaehyuk Choi**, NIH, *The Role of ZEB1 Mutations in Cutaneous T Cell Lymphoma*, 2 months, \$15,669 • **Lawrence Cohen**, NIH, *Optical Studies of Neuron Activity and Organization*, 5 years, \$1,727,806 • **Peter Cresswell**, NIH, *The Role of GILT in the Generation of Reactive Oxygen Species*, 2 years, \$457,875 • **Alecia Dager**, NIH, *Neurochemical and Functional Correlates of Memory in Emerging Adult Marijuana Users*, 4 years, \$658,940 • **Enrique De La Cruz**, NIH, *Actin Filament Elasticity and Actin-Binding Protein Function*, 3.9 years, \$1,705,106 • **Elise DeVito**, NIH, *COMT Inhibition as a Novel Treatment for Nicotine Addiction in Women*, 2 years, \$359,975 • **Sabrina Diano**, NIH, *Mitochondrial Dynamics in VMH Neurons Control Glucose Metabolism*, 3.9 years, \$1,498,500; NIH, *Central Prolyl Carboxypeptidase (PRCP) in the Regulation of Metabolism*, 5 years, \$1,883,062 • **Marcelo Dietrich**, NIH, *The Intracellular Dynamics of AGRP Neurons Under Different Metabolic Conditions*, 5 years, \$1,873,125 • **Deepak D'Souza**, NIH, *Intravenous Alcohol and THC Effects on Simulated Driving and Related Cognition*, 2 years, \$343,613 • **Marie Egan**, NIH, *Targeted Correction of the Human CFTR Gene*, 3.8 years, \$2,219,404 • **Anne Eichmann**, NIH, *Targeting Endothelial Migration to Prevent Neovascularization*, 3.8 years, \$1,665,000; NIH, *Novel Approaches to Manipulate Sprouting Angiogenesis*, 5 years, \$1,873,125 • **Irina Esterlis**, NIH, *PET-fMRI Study of Glutamate and Frontal Function in Bi- and Unipolar Depression*, 4.8 years, \$3,573,873 • **Lauren Ferrante**, NIH, *Critical Illness, Disability, and Vulnerability in Older Persons*, 1.8 years, \$249,750
David Fiellin, NIH, *Working with HIV Clinics to Adopt Addiction Treatments Using Implementation Facilitation (What If?)*, 4.7 years, \$2,866,224
Jorge Galán, NIH, *Mechanisms of Type III Protein Secretion*, 5 years, \$2,854,225 • **Alison Galvani**, NSF, *Collaborative Research: Signaling Prosociality: Harnessing Impure Motives to Help Others*, 3 years, \$57,626 • **Jean-Francois Geschwind**, NIH, *See, Reach, Treat Tumor-Optimized Transarterial Chemoembolization Drug Delivery*, 11 months, \$549,874 • **Michael Girardi**, NIH, *Local Immunoregulation of Cutaneous Carcinogenesis*, 5 years, \$1,987,679 • **Sarah Goldberg**, DoD, *Evaluation of Biomarkers Predictive of Benefit from the PD-1*

Inhibitor MK-3475 in Patients with Non-Small Cell Lung Cancer and Brain Metastases, 2 years, \$399,599 • **Daniel Goldstein**, NIH, *Academic Leadership in the Biology of Aging and Cardiovascular Diseases*, 4.7 years, \$650,535 • **Jose Gomez Vilalobos**, NIH, *Functional Role of hsa-miR-504 in Airway Inflammation and Remodeling in Asthma*, 5 years, \$694,575 • **Elena Gracheva**, NIH, *The Role of TRPM8 and Nav1.8 Channels in Cold Tolerance of Hibernators*, 4.8 years, \$1,820,029 • **Eduardo Groisman**, NIH, *Co-Opting Ancestral Regulatory Systems to Control Bacterial Virulence*, 11 months, \$368,148 • **Marc Hammarlund**, NIH, *New Mechanisms in Axon Regeneration*, 5 years, \$1,821,095
Roy Herbst, Susan Mayne, NIH, *Yale SPORE in Lung Cancer (YSILC): The Biology and Personalized Treatment of Lung Cancer*, 4.9 years, \$11,384,992
Joy Hirsch, NIH, *Mechanisms of Interpersonal Social Communication: Dual-Brain fNIRS Investigation*, 4.9 years, \$2,063,155 • **Jonathon Howard**, NIH, *Cell Biological Limitations Constrain Dendritic Branching Morphology and Neuronal Function*, 4.9 years, \$4,162,490 • **Evelyn Hsieh**, NIH, *Risk for Bone Loss Among Individuals with HIV in a Resource-Limited Environment*, 4.9 years, \$691,741
Shuta Ishibe, NIH, *Role of Calpain in Podocyte Injury*, 5 years, \$1,873,125 • **Alla Ivanova**, NIH, *Role of the Mitochondrial Protein Fus1 in Age-Related Hearing Loss*, 2 years, \$457,875 • **Yasuko Iwakiri**, NIH, *Alcohol Metabolism in Liver Sinusoidal Endothelial Cells*, 2 years, \$437,063 • **Daniel Jane-Wit**, NIH, *Mechanisms of Non-Canonical NF- κ B Activation in Transplant Arteriosclerosis*, 1 year, \$131,895
Raymond Johnson, NIH, *Role of Plac8 in Natural and Vaccine-Generated Immunity Against Chlamydia Infections*, 3.9 years, \$1,469,424; NIH, *Role of CD8IL-13 T Cells in Chlamydia Infection-Associated Immunopathology*, 1.7 years, \$413,977
Anne Marie Jukic, NIH, *An Investigation of Vitamin D in Human Fertility and Early Pregnancy*, 3 years, \$727,794 • **Naftali Kaminski, Patty Lee**, NIH, *Training in Translational Lung Biology and Pathobiology*, 5 years, \$3,198,385 • **Naftali Kaminski**, NIH, *Genomic Analysis of Tissue and Cellular Heterogeneity in IPF*, 3.8 years, \$3,069,296 • **Insoo Kang**, NIH, *Aging and IL-7-Mediated CD8+ T Cell Survival*, 1 year, \$416,250 • **Samuel Katz**, NIH, *Synergizing Pro-Apoptotic and Car-T Cell Immunotherapy for Mantle Cell Lymphoma*, 2 years, \$398,352 • **Barbara Kazmierczak**, NIH, *Medical Scientist Training Program*, 5 years, \$11,438,674
Trace Kershaw, NIH, *Research Education Institute for Diverse Scholars (REIDS)*, 4.8 years, \$1,323,281
Albert Ko, NIH, *Naturally Acquired and Vaccine-Mediated Immunity to Leptospirosis*, 5 years, \$4,003,326 • **Jonathan Koff**, NIH, *Novel Role of EGFR in Virus-Induced Asthma Exacerbations*, 4.9 years, \$2,081,250 • **Camille Konopnicki**, NIH, *Connecting Interpersonal Variation in Gut Microbial Communities to Warfarin Efficacy*, 2 years, \$106,600 • **Priti Kumar**, NIH, *Exploring Antibody-Fc Effector Function in Humanized Mouse Models of HIV Latency*, 2 years, \$464,478 • **Daeyeol Lee**, NIH, *Neural Basis of Temporal Decision Making*, 5 years, \$2,085,711 • **Patty Lee**, NIH, *TLR4-Mediated Mechanisms of Lung Aging*, 1 year, \$402,618
Rafael Lefkowitz, DHHS, *Risk Factors for Injury and Illness in Seafarers*, 3 years, \$324,000 • **Mark Lemmon**, 1 TBN, NIH, *Understanding EGF Receptor Activation by Growth Factors and Oncogenic Mutations*, 5 years, \$2,560,782 • **Ifat Levy**, NIH, *Medical Decision Making Under Uncertainty in Older Adults—Behavior and fMRI*, 1.6 years, \$457,875 • **Jangho Lim**, NIH, *Cellular and Molecular Studies of SBMA Neuromuscular Disease*, 5 years, \$1,821,095 • **Elan Louis**, NIH, *Clinical Pathological Study of Cognitive Impairment in Essential Tremor*, 3.9 years, \$2,561,629; NIH, *In Vivo Quantification of Cerebellar GABA and NAA in Essential Tremor*, 3 years, \$1,887,554; NIH, *Environmental Epidemiology of Essential Tremor*, 7 months, \$532,480 • **Xingguang Luo**, NIH, *Post-GWAS Transcriptome-Wide LncRNA Expression Profiling in Alcohol Dependence*, 2 years, \$343,613 • **Shrikant Mane**, NIH, *High Performance Computing Instrumentation for the Yale Center for Genome Analysis*, 1 year, \$889,820 • **Stephanie Marshall**, NIH, *The Role of Hepatic FMO3 in Ethanol Induced Liver Injury*, 2 years, \$110,236 • **Sherry McKee**, SAMHSA, *Integrated System of Care for Addicted Offenders Re-Entering Their Communities*, 3 years, \$1,195,353
James McPartland, NIH, *Multimodel Assessment of Social Process Systems across Neurodevelopmental Disorders*, 3 years, \$650,980 • **Gil Mor**, NIH, *Targeting the Vascularity for Delivery of Inhibitors of Metastasis in Ovarian Cancer*, 5 years, \$2,555,885; NIH, *Effect of Polymicrobial Infection on Trophoblast-Macrophage Interactions*, 1 year, \$401,793 • **Evan Morris**, NIH, *Imaging Sex Differences in Smoking-Induced Dopamine Release Via*

Novel PET Methods, 4.8 years, \$3,662,999; NIH, *PET-Derived 'Dopamine Movies' of Early-Stage Addiction to Cigarette Smoking: A Pilot Study*, 1.9 years, \$383,783 • **Walter Moss**, NIH, *Understanding Epstein Barr Virus Oncogenicity through Non-Coding RNA Structure*, 2 years, \$180,000
Walther Mothes, NIH, *Single Molecule Imaging of HIV-1 Entry*, 4 years, \$1,550,477 • **Karla Neugebauer**, NIH, *Cross-Regulation Between Transcription and Pre-mRNA Splicing*, 4.9 years, \$1,621,781 • **Stefania Nicoli**, NIH, *Integrating miR-107 into Signaling Pathways that Coordinate Neurogenesis and Brain Vascular Permeability*, 5 years, \$2,092,500 • **James Noonan**, NIH, *Identifying Enhancers with Human-Specific Developmental Functions*, 4 years, \$2,602,928 • **Kevin O'Connor**, NIH, *Mechanisms of Autoantibody Production in Myasthenia Gravis*, 3 months, \$416,250; NIH, *Mechanisms of Autoantibody Production In Myasthenia Gravis*, 5 years, \$1,779,271 • **Chirag Parikh**, NIH, *Leveraging Clinical Trials of Diabetic Kidney Disease to Advance Biomarkers*, 4.9 years, \$2,259,831 • **Godfrey Pearlson**, NIH, *3/5 Bipolar Schizophrenia Network for Intermediate Phenotypes 2 (BSNIP-2)*, 4.8 years, \$3,507,892 • **Godfrey Pearlson, Michael Stevens**, NIH, *Neuroscience of Marijuana Impaired Driving*, 4.8 years, \$2,868,635
Kevin Pelphrey, NIH, *Training Program in Childhood Neuropsychiatric Disorders*, 5 years, \$2,012,516 • **Christopher Pittenger**, NIH, *Characterization of Sera from Patients with PANDAS*, 1 year, \$58,800 • **Mohini Ranganathan**, NIH, *Gender Related Differences in the Acute Effects of Delta-9-Tetrahydrocannabinol in Healthy Humans*, 2 years, \$359,975 • **Leslie Rickey**, NIH, *Prevention of Lower Urinary Tract Symptoms in Women: Yale Bladder Health Clinical Center*, 4.9 years, \$2,482,819 • **Jesse Rinehart**, NIH, *Revealing Substrates and Phosphoproteome Level Function of Human STE20 Kinases*, 4.9 years, \$1,666,790
John Rose, NIH, *Testing a Novel Approach Toward a Multivalent Chikungunya/Dengue Vaccine*, 2 years, \$457,875 • **Michael Rowe, Chyrell Bellamy, Larry Davidson, Marc Rosen, William Bromage**, NIH, *Financial and Mental Health: Exploratory Research and Model Development*, 2 years, \$749,250 • **Albert Sinusas**, NIH, *Training in Multimodality Molecular and Translational Cardiovascular Imaging*, 5 years, \$1,525,521 • **Stefan Somlo**, DoD, *The Therapeutic Effect of the Antitumor Drug 11beta and Related Molecules on Polycystic Kidney Disease*, 3 years, \$1,248,750 • **Hugh Taylor**, NIH, *The Yale WRHR Career Development Center*, 5 years, \$1,701,000 • **Jacob Tebes**, NIH, *Research Training Program in Substance Abuse Prevention*, 5 years, \$1,730,976 • **Jeffrey Testani**, NIH, *Diagnosing and Targeting Mechanisms of Diuretic Resistance in Heart Failure*, 4.8 years, \$3,778,556
Susumu Tomita, NIH, *Regulation of Glutamate Receptors by Calcium-Dependent Protein Kinases*, 2.8 years, \$1,248,750 • **Christian Tschudi**, NIH, *RNA Metabolism in Trypanosomes*, 5 years, \$3,912,820
Vasilis Vasilou, NIH, *Glutathione Monoesters to Counteract Ocular Chemical Injury*, 2 years, \$692,027 • **Daniel Vatner**, NIH, *In Vivo Regulation of Lipid Flux in the Etiology of NAFLD and Insulin Resistance*, 4.8 years, \$722,410 • **Narendra Wajapeyee**, NIH, *Metabolic Drivers of Lung Cancer Initiation, Progression and Therapy Response*, 2 years, \$398,352; NIH, *A Novel Drugable Genetic Vulnerability Pathway in Melanoma*, 5 years, \$1,914,446; NIH, *Anoikis Effectors as Drivers of Metastatic Melanoma*, 2 years, \$399,982 • **Lisa Walke**, TBN, DHHS, *Geriatrics Workforce Enhancement Program*, 3 years, \$2,480,940 • **Emily Wang**, Department of Justice, *Measuring Successful Reentry: Linkage of Corrections and Community Healthcare Data*, 1.5 years, \$258,113 • **Daniel Weinberger**, NIH, *Forecasting Pneumococcal Serotype Frequencies to Develop Adult-Specific Vaccines*, 1 year, \$426,511 • **Sandra Wolin**, NIH, *Recruitment of Host Noncoding RNAs by HIV-1*, 2 years, \$467,109
Qin Yan, DoD, *BC141326: Epigenetic Mechanisms of Breast Cancer Metastasis*, 5 years, \$4,162,496
Xiaoyong Yang, NIH, *O-GlcNAc Signaling in Central Control of Energy Balance*, 3.9 years, \$1,761,556 • **Yang Yang**, DoD, *The Intraovarian Tumorigenesis of Extra Ovarian Originated Ovarian Cancer*, 5 years, \$1,190,500 • **Kimberly Yonkers**, NIH, *Progesterone Augmentation for Smoking Cessation in Women*, 2 years, \$398,352; DHHS, *Prenatal Substance Use Screening: Validation and Comparison of Promising Measures*, 2 years, \$1,199,816 • **Hitten Zaveri**, NSF, *CPS: Synergy: Collaborative Research: Fault Tolerant Brain Implantable Cyber-Physical System*, 3 years, \$487,712 • **David Zenisek**, NIH, *Investigating the Role of Ribeye in Retinal Ribbon Function*, 5 years, \$1,665,000 • **Yongli Zhang**, NIH, *Single-Molecule Manipulation of SNAREs*, 3.8 years, \$1,434,716
Sheng Zhang, NIH, *Thalamic Cortical Dysfunction and Predictors of Relapse in Cocaine Dependence*, 5 years, \$834,352 • **Z. Jimmy Zhou**, NIH, *Functional Dissection of New Retinal Circuits*, 3 years, \$1,255,000

Non-federal

Clara Abraham, Crohn's & Colitis Foundation of America (CCFA), *Mechanisms Modulating Pattern Recognition-Induced Signaling in Human Myeloid-Derived Cells*, 3 years, \$347,488 • **Vikki Abrahams**, American Heart Association (Founders Affiliate),

Role of TAM Receptors in Modulation of Trophoblast Function and Vascular Remodeling in Obstetric APS, 3 years, \$197,799 • **Adedotun Adebamiro**, American Society of Nephrology, *Ben J. Lipps Research Fellowship Program*, 2 years, \$100,000
Nadia Ameen, University of Miami (NIH), *Microvillus Inclusion Disease: Polarized Traffic and Signaling, a Lead to Therapy*, 11 months, \$153,333 • **Emily Ansell**, Peter F. McManus Charitable Trust, *Relationship Processes in Couples Coping with PTSD that Increase Risk for Hazardous Drinking*, 1 year, \$50,000 • **Alan Anticevic**, Brain & Behavior Research Foundation (formerly NARSAD), *Dissecting Psychosis via Multimodal Neuroimaging, Pharmacology and Computation*, 2 years, \$100,000
Amy Arnsten, BlackThorn Therapeutics, *Effects of Kappa Receptor Antagonist on Prefrontal Functions Related to Decision Making*, 2.5 years, \$695,214 • **Marc Auerbach**, Children's Hospital Los Angeles, *Using Leaderboards to Improve CPR Simulation Practice Among Healthcare Professionals*, 2 years, \$3,278 • **Jeffrey Bender**, State of Conn. Dept. of Public Health, *Macrophage Integrin-Modulated RNA Stability in Neovessel Formation*, 2 years, \$343,834 • **Anton Bennett**, Broad Institute, *Investigating PTPRF Function in Schizophrenia*, 1 year, \$83,250 • **Xin Bian**, Human Frontier Science Program Organization, *ER-PM Tethering Protein Extended Synaptotagmin 1 Plays an Important Role in Cell Migration*, 3 years, \$160,980
Marcus Bosenberg, Kim Blenman, Lucia Jilaveanu, Susan Kaech, Melanoma Research Foundation, *Mechanisms Controlling Melanoma Dormancy and Metastatic Progression*, 2 years, \$400,000 • **James Boyer**, Intercept Pharmaceuticals, *The International Primary Sclerosing Cholangitis Study Group Meeting*, 9 months, \$34,000
Michael Bracken, Brian Leaderer, Janneane Gent, Theodore Holford, State of Conn. Dept. of Public Health, *Environmental Tobacco Smoke and Asthma Exacerbations in Children of Low Income Families: A Feasibility Study*, 2 years, \$210,972
Elizabeth Bradley, World Health Organization, *Liberia Health Workforce Program: Health Management*, 7 months, \$96,241; Bill and Melinda Gates Foundation, *Primary Health Care Unit Transformation Initiative (PTI)*, 3.2 years, \$7,501,334; IMD Marketing Consulting, *Hospital Leadership Certificate Program*, 2 years, \$200,000
Douglas Brash, L'OREAL, *Controlling Chemoprotection in the Skin: Exploration of Dark CPD Production in Skin*, 2 years, \$426,323 • **William Cafferty**, State of Conn. Dept. of Public Health, *Novel Cell Autonomous Modulators of Intrinsic CNS Axon Growth Enhance Functional Recovery after Stroke*, 2 years, \$246,108; Craig H. Neilsen Foundation, *Polyphosphate-5-Phosphatases Modulate Intrinsic CNS Axon Growth*, 2 years, \$300,000; Connecticut Innovations, *Polyphosphate-5-Phosphatases Enhance Functional Regeneration after Spinal Cord Injury*, 2 years, \$200,000 • **John Cahill, Vinod Srihari**, Patrick and Catherine Weldon Donaghe Medical Research Foundation, *'STEPPing Out': Supporting the Dissemination of STEP Care Using an Outcomes-Based Care Management Tool and Online Community*, 1.5 years, \$55,000 • **Kathleen Carroll**, McLean Hospital (NIH/DHHS), *Clinical Trials Network: New England Consortium Node*, 9 months, \$384,117 • **Richard Carson**, UCB BioPharma SPRL (formerly UCB Pharma S.A.), *Novel PET Ligand Selection Study in NHPs*, 4 months, \$181,652; UCB BioPharma SPRL (formerly UCB Pharma S.A.), *Novel PET Ligand Selection Study in NHPs*, 1.2 years, \$95,738 • **Marcelo Cassini**, PKD Foundation for Research in Polycystic Kidney Disease, *Can Mcp1 Knock-out and Blockage of Macrophage Receptor CCR2 Alter the Outcome of Polycystic Kidney Disease (PKD)?*, 2 years, \$100,000 • **Sandy Chang**, State of Conn. Dept. of Public Health, *Role of Dysfunctional Telomeres in Breast Cancer Pathogenesis*, 2 years, \$300,010
Lieping Chen, Pfizer, U.S. Pharmaceuticals Group, *Discovery and Development of New Immune Modulation Agents—Development of New Mouse Models for Human Immune-Oncoology*, 3 years, \$2,373,222; Next Cure, *Discovery of Novel Immuno-Oncology Targets and Development of Therapeutic Agents*, 5 years, \$12,388,461 • **Sidi Chen**, Damon Runyon Cancer Research Foundation, *Investigation of Dicer as a Novel Therapeutic Route Toward the Inhibition of Tumorigenesis and Neoplastic Growth*, 2 years, \$100,000 • **Shih-Chuan Chou**, Emergency Medicine Foundation, *A Secret-Shopper Evaluation of Primary Care Access Following ED Discharge-Evaluating the Impact of the Affordable Care Act*, 1 year, \$9,250
Oscar Colegio, Doris Duke Charitable Foundation, *Defining Intercellular Metabolic Networks in Human Cutaneous Squamous Cell Carcinoma*, 3 years, \$486,000 • **Susan Compton**, ACLAM Foundation, *Biology and Impact of Murine Astrovirus*, 1 year, \$14,750 • **Gianfilippo Coppola**, Connecticut Innovations, *Brain-on-Chip*, 2 years, \$199,979
Guoliang Cui, Cancer Research Institute, *The Influence of Nutrient Availability in the Tumor Microenvironment on CD8+ T Cell Survival and Function*, 2 years, \$106,000 • **John Davis**, University of California, Berkeley, Fogarty International Center (NIH/DHHS), *International Research Training on TB and Other Pulmonary Complications of HIV*, 2.5 years, \$15,782; Regents University of California, San Francisco (NIH/DHHS),

Inflammation, Aging, Microbes, and Obstructive Lung Disease (I AM OLD) Study, 10 months, \$14,739 • **Maria Teresa Dell'Anno, Marco Onorati**, Connecticut Innovations, *Human Neuroepithelial Stem Cells in Spinal Cord Injury*, 2 years, \$200,000 • **Kamil Detyniecki**, Acorda Therapeutics, *Demographics, Clinical Characteristics, Frequency, and Associated Outcomes of Seizure Clusters Among Outpatients with Epilepsy at Two Tertiary Care Centers*, 4 years, \$48,872 • **Marcelo Dietrich**, Whitehall Foundation, *Dissecting Interoceptive Circuits Critical for Cognitive Outputs*, 3 years, \$225,000; Charles H. Hood Foundation, *Hypothalamic Circuits Underlying Brain Development During Childhood*, 2 years, \$150,000 • **Edward Doherty**, Mallinckrodt Pharmaceuticals, *Mallinckrodt Pharmaceuticals Research Fellowship*, 1 year, \$80,000 • **George Dragoi**, Whitehall Foundation, *Neuronal Ensembles Underlying Internal Representations*, 3 years, \$225,000 • **Robert Dubrow**, Overlook International Foundation, *The Yale School of Public Health Response to Climate Change: Educating and Training the Next Generation of Public Health Leaders*, 3.9 years, \$1,096,679 • **Marie Egan, Peter Glazer, W. Mark Saltzman**, Cystic Fibrosis Foundation Therapeutics (CFFT), *Gene Editing using Nanoparticles with Triplex-Forming PNAs*, 2 years, \$334,263 • **Sukru Emre**, University of Texas Southwestern Medical Center at Dallas (NIH/DHHS), *A Multi-Center Group to Study Acute Liver Failure*, 5 years, \$97,767 • **Irina Esterlis**, Nancy Taylor Foundation for Chronic Diseases, *Validation of Methods to Image Ketamine-Induced Changes in the Human Brain*, 3 years, \$547,525 • **James Farrell**, American Association for Cancer Research, *CAPS Multicenter Trial: Imaging and Markers for Pancreatic Cancer Screening*, 1 year, \$30,000 • **Richard Flavell**, Connecticut Innovations, *A Mouse Model of the Human Immune System*, 1.7 years, \$500,000; Benaroya Research Institute (NIH), *Study of Innate Immune Cells and Development of a Humanized Mouse Model of Scleroderma*, 1 year, \$83,417 • **Liana Fraenkel**, Rheumatology Research Foundation, *Preference Phenotypes to Support Dyadic Decision Making in Rheumatoid Arthritis*, 2 years, \$401,252 • **Lisa Fucito**, Medical University of South Carolina (NIH/DHHS), *Novel Treatment to Enhance Smoking Cessation before Cancer Surgery*, 1 year, \$162,214 • **Aileen Garipey**, Society of Family Planning, *Serious Games for Serious Issues: Reducing High-Risk Sexual Behavior in Adolescents through a Mobile Game App*, 5 months, \$22,199 • **Joel Gelernter**, Kennedy Krieger Institute (NIH/DHHS), *A GEWIS Study of Smoking, Hazardous Drinking, and Other Health Risk Behaviors*, 1 year, \$104,092; Kennedy Krieger Institute (NIH/DHHS), *Risk and Resilience in Mal-treated Children*, 1 year, \$47,345 • **Jean-Francois Geschwind**, Threshold Pharmaceuticals, *The Pre-clinical Study of TH-302 Combined with DEB-TACE in a Rabbit Model of Liver Cancer*, 1.5 years, \$96,456; Boston Scientific Corporation, *Paclitaxel-Eluting-Beads Transarterial Chemoembolization using Oncospheres in a Rabbit VX2 Liver Cancer Model*, 1.3 years, \$400,000; Philips Healthcare, *Exhibit B-10 Specific Research Plan for Image-Guided Interventional Oncology: Plan, See, Reach, Treat and Assess Project*, 7 years, \$1,050,000 • **Emily Gilmore**, American Academy of Neurology, *Understanding Potentially Harmful EEG Patterns in Patients with Acute Brain Injury and Critical Illness*, 2.2 years, \$130,000 • **Emily Goldberg**, American Federation for Aging Research, *Impact of Ketone Metabolites on Age-Related Inflammation*, 1 year, \$51,000 • **Jose Gomez Villalobos**, Flight Attendant Medical Research Institute, *A 3-Gene Signature in Smoking Exposure and Asthma*, 1 year, \$108,500 • **Andrew Goodman**, Burroughs Wellcome Fund, *Resilience of the Human Gut Microbiota During Infection*, 5 years, \$500,000 • **Steven Gore**, University of Michigan (NIH/DHHS), *Epigenetic Biomarkers of Response to Azacytidine in Myelodysplastic Syndromes*, 10 months, \$41,625 • **Valentina Greco**, Edward Jr. Mallinckrodt Foundation, *Understanding the Malignant Behaviors that Lead to Cancer*, 4 years, \$400,000 • **Ashima Gulati**, American Society of Nephrology, *Ben J. Lipps Research Fellowship Program*, 2 years, \$100,000 • **Shangqin Guo**, Gilead Sciences, *Molecular Definition of Leukemia Cell-of-Origin*, 2 years, \$130,000 • **Abha Gupta**, Connecticut Innovations, *Human iPSC Modeling of Autism-Associated Mutations in the Gene CHD8*, 2 years, \$200,000 • **Namita Gupta**, Pharmaceutical Research & Manufacturers of America (PhRMA) Foundation, *Probing Adaptive Immunity by Computational Analysis of B Cell Repertoire Sequencing Data*, 2 years, \$40,000 • **David Hafler**, GE Global Research (DHHS), *Development of Sample Sparing Assays for Monitoring Immune Responses (U24)*, 11 months, \$73,568; Nancy Taylor Foundation for Chronic Diseases, *Human Genetic Variation in Cytokine Signaling Pathways and Susceptibility to Autoimmune Disease*, 2 years, \$230,000 • **Mihaly Hajos**, Forum Pharmaceuticals (Formerly En Vivo Pharmaceuticals), *Evaluation of Encencline, an $\alpha 7$ Nicotinic Acetylcholine Receptor Agonist on Hippocampal Neurophysiology*, 1 year, \$151,197; H. Lundbeck, *Developing In Vivo Efficacy Assays for Testing 5-HT₆ Receptor Antagonists in APP/PS1*

Transgenic Rats and Establishing Neurophysiology-Based Translations Biomarkers, 1 year, \$175,492 • **Ilan Harpaz-Rotem**, Brain & Behavior Research Foundation (formerly NARSAD), *Combining Neurobiology and New Learning: Ketamine and Prolonged Exposure: A Potential Rapid Treatment for PTSD*, 2 years, \$100,000 • **Jose Herazo-Maya**, Pulmonary Fibrosis Foundation, *Serum microRNA Expression Profiles as Biomarkers in Idiopathic Pulmonary Fibrosis*, 2 years, \$50,000; Robert Wood Johnson Foundation, *Peripheral Blood Biomarkers in IPF—Role of Aberrant Immunity*, 4 years, \$420,000 • **Kevin Herold**, Tiziana Life Sciences, *Preclinical Studies of NI-0401 in Humanized Mice at Yale University (K. Herold)*, 1 year, \$133,652; Merck Sharp & Dohme, *Do Humanized Mice Recapitulate the Clinical Experience of a Synergistic Hepatotoxic Response after Administration of Immune Checkpoint Blockade (ICB) Inhibitors?*, 1 year, \$100,000 • **Ellen Hoffman**, Simons Foundation, *High-Throughput Drug Discovery in Zebrafish Models of ASD Risk Genes*, 2 years, \$250,000 • **Theodore Holford**, University of Michigan (NIH/DHHS), *Comparative Modeling of Lung Cancer Prevention and Control Policies*, 11 months, \$232,866 • **Mark Horowitz**, Maine Medical Center Research Institute (NIH), *Interdisciplinary Study of Marrow Adiposity, Mineral Metabolism and Energy Balance*, 1 year, \$421,846 • **Karen Hirschi**, Connecticut Innovations, *Generation of Human Hemogenic Endothelial Cells*, 3 years, \$750,000 • **Yingqun Huang**, American Diabetes Association, *Mechanism of H19 Long Noncoding RNA-Mediated Regulation of Glucose Metabolism*, 3 years, \$348,500 • **Yasuko Iwakiri**, State of Conn. Dept. of Public Health, *Type 2 Diabetes and Non-Alcoholic Fatty Liver Diseases*, 2 years, \$295,550 • **Akiko Iwasaki**, FluGen (NIH), *Restimulating Memory T Cell Responses in Elderly by a Novel, Live Influenza Vaccine*, 1 year, \$134,998 • **Ayana Jordan**, American Psychiatric Association (SAMHSA), *APA/Substance Abuse & Mental Health Services Administration Fellowship*, 1 year, \$26,058 • **Christoph Juchem**, Race to Erase MS, (formerly The Nancy Davis Foundation for Multiple Sclerosis), *1H-MR Spectroscopy Markers Sensitive to De- and Remyelination: Yale – Juchem A Longitudinal Pilot Study of Acute Multiple Sclerosis Lesions at 7 Tesla*, 1 year, \$75,000 • **Amanda Kallen**, American Society for Reproductive Medicine, *Reproductive Scientist Development Program*, 1 year, \$10,000 • **Naftali Kaminski**, University of Pittsburgh (NIH), *Network Management Core (NEMO) for the Pulmonary Trials Cooperative (PTC)*, 1 year, \$11,858 • **Barbara Kazmierczak**, University of Maryland (NIH), *Catheter Associated Urinary Tract Infection by Pseudomonas Aeruginosa*, 3 years, \$94,063 • **Richard Kibbey**, Poxel SA, *Characterization of the Mechanism of Action Imeglimin-Stimulated Insulin Secretion*, 6 months, \$88,245; Pfizer Inc., U.S. Pharmaceuticals Group, *Flux-Based LC/MS Screening Platform for Cellular Metabolism: Application to KHK*, 2 years, \$250,000; Eli Lilly and Company, *Identification of the Metabolic Fluxes for Pancreatic Islet Health and Function*, 2 years, \$265,000 • **Kenneth Kidd**, Defense Intelligence Agency, *Next-Generation DNA Sequencing (NGS) Technology for Enhanced Human Forensics*, 10 months, \$347,222 • **Anthony Koleske**, Ariad Pharmaceuticals, *Influence of Ponatinib on Rho:ROCK Signaling as a Contributing Mechanism for Vascular Occlusion*, 1 year, \$125,000 • **Diane Krause**, Connecticut Innovations, *Regenerative Medicine for Hypoparathyroidism*, 3 years, \$750,000 • **Martin Kriegel**, Benaroya Research Institute (NIH), *Shaping of the Human Gut Microbiome by an Autoimmune Risk Allele*, 1 year, \$124,875 • **Robert LaMotte**, Johns Hopkins University (NIH), *Peripheral Neuronal Mechanisms of Itch*, 1 year, \$100,459 • **Alexandra Lansky, Xin Zhao**, Boston Scientific Corporation, *Boston Scientific, Training Fellowship Grant for Xin Zhao*, 1.3 years, \$100,000 • **Karel Liem**, American Society of Nephrology, *Characterization of a Novel Mouse Model of Ciliopathic Cystic Renal Disease*, 2 years, \$200,000 • **Joseph Lim**, Patient-Centered Outcomes Research Institute, *Patient Reported Outcomes Project of HCV-TARGET (PROP up TARGET)*, 1 year, \$36,890 • **Erika Linnander**, Global Environment & Technology Foundation, *The Last Mile Partnership: Building Capacity to Save Lives*, 5 years, \$740,353; Bill and Melinda Gates Foundation, *Building and Sustaining Performance Management Capacity in Uttar Pradesh and Bihar*, 7 months, \$157,474 • **Chi Liu**, Philips Healthcare, *Specific Research Plan for Imaging Small Lesions using a Prototype Photon Counting CT System*, 2.1 years, \$211,728 • **Patricia LoRusso**, Leidos Biomedical Research (Formerly SAIC Frederick) (NCI/NIH), *NCI 9767 An Open Label, Multi-center, Single Arm Phase II Study to Evaluate the Activity and Tolerability of the Novel mTOR Inhibitor, MLN0128, in Patients with Locally Advanced or Metastatic Transitional Cell Carcinoma of the Urothelial Tract Whose Tumors Harbor a TSC1 and/or a TSC2 mutation*, 1.1 years, \$120,586 • **Jun Lu**, Connecticut Innovations, *Novel Insights and Approaches toward Accelerated Hematopoietic Regeneration*, 4 years, \$750,000 • **Xiaomei Ma**, University of California, Berkeley (NIH), *Center for Integrative Research on Childhood Leukemia and the Environment—Project 1*, 9 months, \$76,585

Robert Makuch, Merck & Company, *The CFDA Training for October 2015*, 3 months, \$77,825 • **Carolyn Mazure**, Community Foundation for Greater New Haven, *General Operating Support for Heart and Cancer Research—Research*, 3 years, \$150,000 • **Sherry McKee**, Lumme (NIH), *Leveraging Mobile Biosensors for Just-In-Time Intervention*, 1.8 years, \$649,282 • **Ruslan Medzhitov**, AbbVie, *Identification and Targeting of Tfh-Inducing Dendritic Cells*, 4 years, \$1,665,000 • **Alan Morrison**, Actelion Pharmaceuticals U.S., *Development of MicroRNA-based Therapeutic Strategies for Pulmonary Artery Hypertension*, 1 year, \$100,000 • **Angus Nairn**, Rockefeller University, *Assaying Translational Dynamics in Specific Neuronal Subtypes*, 11 months, \$101,582 • **Deepak Narayan**, Baxter Healthcare Corporation, *Lower Extremity Surgery Cadaver Lab*, 1 year, \$5,000 • **Laura Niklason, Karen Hirschi**, Connecticut Innovations, *Engineered Arteries and iPSC-Derived Endothelium*, 3 years, \$748,926 • **Elaine O'Keefe**, IMD Marketing Consulting Co., *Disaster Preparedness Program: Education and Training for Chinese Government Officials and Leaders*, 1 year, \$7,400 • **Michael Paidas**, BiIncept (NIH), *Treatment of Acute Radiation Syndrome Using PIF, a Natural Immune Modulator*, 1 year, \$175,525 • **A Paltiel**, Massachusetts General Hospital (NIH), *Novel Methods to Inform HIV/TB Clinical Trial Development*, 1 year, \$68,796; Massachusetts General Hospital (NIH), *The Cost-Effectiveness of Preventing HIV Complications*, 1 year, \$30,869 • **Jose Panisello**, Hamad Medical Corporation, *Noaf al-Mahmoud Training Program*, 1 year, \$176,216 • **Xenophon Papademetris**, Electrical Geodesics (NIH), *Multimodal Image Analysis Software for Epilepsy*, 1.5 years, \$49,570 • **Chirag Parikh**, Johns Hopkins University (NIH), *Biomarkers of Kidney Injury to Predict AKI Onset and Progression in HIV Infection*, 1 year, \$45,906 • **Sangbum Park**, Connecticut Innovations, *Understanding Mechanism of Tissue Repair by Live Imaging*, 2 years, \$200,000 • **Abhijit Patel**, Honorable Tina Brozman Foundation, *Ultrasensitive Detection of Tumor DNA in Blood for Early Diagnosis of Ovarian Cancer*, 2 years, \$200,000; Honorable Tina Brozman Foundation, *Tina Brozman Ovarian Cancer Planning Grant Agreement*, 1.2 years, \$15,000 • **Melinda Pettigrew**, Duke University (NIH), *Antibacterial Resistance Leadership Group (ARLG)*, 1 year, \$34,079 • **Robert Pietrzak**, Icahn School of Medicine at Mount Sinai (ISMS) (CDC/DHHS), *Gene Expression Profiles as Markers of PTSD Risk and Resilience in WTC Responders*, 1 year, \$4,697 • **Margaret Pisani**, Patrick and Catherine Weldon Donaghue Medical Research Foundation, *Nocturnal Ambient Protection Protocol (NAPP) to Improve Patient Sleep in the ICU*, 1 year, \$200,000 • **Christopher Pittenger**, Brain & Behavior Research Foundation (formerly NARSAD), *Translational Biomarkers in an Animal Model of Tic Disorders*, 2 years, \$100,000 • **Angelica Ponguta**, Fundacion Saldarriaga Concha, *FSC Evaluation Framework*, 1 month, \$35,000 • **Yibing Qyang**, Connecticut Innovations, *Targeted Investigation into the Causes and Amelioration of Vascular Proliferative Disease Using Patient-Derived Induced Pluripotent Stem Cells*, 4 years, \$750,000 • **Marcela Reyna**, American Thyroid Association, *The Role of the Renal Na⁺/I⁻ Symporter (NIS) in Iodide Metabolism and Thyroid Function*, 3 years, \$57,500 • **David Rimm**, The Nat'l Comprehensive Cancer Network, *NCCN Institutional Research Agreement*, 1 year, \$72,214; Breast Cancer Research Foundation, *Targeted and Immune Therapies in Breast Cancer*, 1 year, \$250,000 • **Douglas Rothman**, Cure Huntington's Disease Institute Foundation (CHDI), *Effects of Pan-HTT Knockdown on Recently Identified 13C and 1H MRS Flux-Based Biomarkers of Mitochondrial Energetics and Neurotransmitter Cycling in Huntington's Disease*, 1 year, \$243,074; Cure Huntington's Disease Institute Foundation (CHDI), *Effects of Transgenic Nrf2 -ARE Enhancement on Recently Identified 13C and 1H MRS Flux-Based Biomarkers of Mitochondrial Energetics and Neurotransmitter Cycling in Huntington's Disease*, 11 months, \$244,884 • **Joel Rozowsky**, University of California, Los Angeles (NCATS/NIH), *Clinical Utility of Salivary ExRNA Biomarkers for Gastric Cancer Detection*, 10 months, \$19,553 • **Mehran Sadeghi**, State of Conn. Dept. of Public Health, *Molecular Imaging of the Lung*, 2 years, \$327,430 • **Lauren Sansing**, State of Conn. Dept. of Public Health, *Immunomodulation to Enhance Recovery after Intracerebral Hemorrhage*, 2 years, \$188,053 • **Nicola Santoro**, Allen Foundation, *Interactive Effect Between Diet and Gut Flora in the Development of Fatty Liver in Obese Children*, 2 years, \$74,350 • **Maor Sauler**, Flight Attendant Medical Research Institute, *DDT-CD74: A Novel Signaling Pathway that May Protect Against Emphysema*, 1 year, \$108,500 • **Kurt Schalper**, Lung Cancer Research Foundation, *Quantitative Analysis of the PD-1 Axis Components and Immune Infiltrates in Lung Cancer: Predictive Role and Therapeutic Implications*, 1 year, \$75,000 • **Michael Schilsky**, Wilson Disease Association, *Wilson Disease Biotech Associate*, 7 months, \$15,000 • **Joseph Schlessinger**, Gilead Sciences, *Gilead-Yale Collaboration in Cancer—Functional Analysis of New Cancer Targets*, 2 years, \$2,300,700 • **Nenad Sestan**, Boston University (NIH), *Heterogeneity of*

Forebrain Precursors, 4.8 years, \$264,577; Simons Foundation, *Extending ASD Risk Locus Discovery to the Non-Coding Genome through the Integration of Multidimensional Biological Data*, 1.5 years, \$60,000 • **Liang Shan**, American Foundation for AIDS Research (amfAR), *Identification, Reactivation and Elimination of Latent HIV-1 in Humanized Mice*, 2 years, \$150,000 • **Frederick Shic, Pamela Ventola**, Simons Foundation, *Tracking Intervention Effects with Eye Tracking*, 2 years, \$499,862 • **Satinder Singh**, Brain & Behavior Research Foundation (formerly NARSAD), *Elucidating the Biophysical Role of PICK1/DAT Interactions in Attention Deficit Hyperactivity Disorder and Comorbid Neuropsychiatric Diseases*, 2 years, \$100,000 • **Michael Skonieczny**, Anglia Ruskin University, *Training and Development ARU HEEoE*, 1 year, \$150,000 • **Patrick Skosnik**, Forum Pharmaceuticals (Formerly En Vivo Pharmaceuticals), *Novel Electrophysiological Biomarkers Sensitive to Treatment with the Alpha 7 nAChR Partial Agonist EVP-6124 in Schizophrenia*, 1 year, \$26,090 • **Lindsey Stavola**, American Physiological Society, *American Physiological Society—Porter Fellowship Award*, 1 year, \$28,300 • **Stephen Strittmatter**, University of Washington, Seattle (NIH), *National Alzheimer's Coordinating Center*, 1 year, \$26,780; LAM Therapeutics, *Regulation of AB Production through Endocytosis*, 6 months, \$20,000; Dr. Ralph & Marian Falk Med. Res. Trust, *Validation of Targets to Rescue Synapse Loss in Alzheimer's Disease*, 1 year, \$485,000 • **Stephen Strittmatter, Jeffery Kocsis, Marc Hammarlund, William Cafferty**, Dr. Ralph & Marian Falk Med. Res. Trust, *Medical Therapy to Promote Neural Repair and Functional Recovery from Spinal Cord Injury*, 2 years, \$1,000,000 • **Reshef Tal**, American Society for Reproductive Medicine, *The Role of Endothelial Progenitor Cells in Implantation, Placentation and Early Pregnancy Development*, 1 year, \$15,000 • **William Tamborlane**, Helmsley Charitable Trust, *The Leona M. and Harry B., Improving Family Management and Glycemic Control in Youth < 8 years old with Type 1 Diabetes*, 1 year, \$98,923 • **Jeffrey Testani**, Medical University of South Carolina, *Yale-MUSC Collaboration with Dr. Meredith Brisco*, 1 year, \$39,866 • **Mary Tinetti**, American Federation for Aging Research, *John A. Hartford Foundation's Center of Excellence in Geriatric Medicine and Training*, 1 year, \$106,000; John A. Hartford Foundation, *Carealign: Patient Goal-Directed Care for Older Adults with Multiple Chronic Conditions Achieved through Primary/Specialty Care Alignment*, 3 years, \$3,889,741; Robert Wood Johnson Foundation, *Patient Goals Directed Care: High Value Care for Persons with Multiple Chronic Conditions*, 3 years, \$414,751 • **Richard Torres**, Applikate Technologies (NIH), *A New Approach to Fast, Diagnostic-Quality, Intraoperative Microscopic Examination*, 1 year, \$39,345 • **Victoria Ulrich**, American Heart Association (Founders Affiliate), *The Role of miR-29 in Atherosclerosis and Plaque Composition*, 2 years, \$94,600 • **Flora Vaccarino**, Mayo Clinic of Rochester (NIH), *Discovering the Spectrum of Natural Somatic Mosaicism in Human Skin Fibroblasts*, 1 year, \$40,749 • **Christopher Van Dyck**, Alzheimer's Association, *Longitudinal Evaluation of Amyloid Risk and Neurodegeneration—The LEARN Study*, 1 year, \$639,000 • **Silvia Vilarinho**, American Association for the Study of Liver Diseases (AASLD), *Delineating Genetic Underpinnings of Biliary Atresia*, 2 years, \$150,000 • **Merceditas Villanueva**, University of Massachusetts (DHHS), *AIDS Education and Training Center's Program (NEAETC)*, 1 year, \$283,461 • **Emily Wang**, Patient-Centered Outcomes Research Institute, *The Share Project: Building Capacity of Former Prisoners, Criminal Justice Policymakers, and Researchers to Collectively Transform Healthcare Delivery*, 1.7 years, \$255,090 • **Stephen Waxman**, Paralyzed Veterans of America, *Role of Glial Scarring after Injury to the Central Nervous System*, 1 year, \$99,302 • **Li Wen**, Juvenile Diabetes Research Foundation International, *Study of Oral Microbiota in Prediction of T1D Development*, 1 year, \$110,000 • **Sandra Wolin**, State of Conn. Dept. of Public Health, *A Novel Pathway that May Protect Against Development of Sunlight-Induced Cancers*, 2 years, \$264,720 • **Dianqing Wu, Hai Wu**, Connecticut Innovations, *Development of Anti-COLORECTAL Cancer Immunobiologics*, 2.5 years, \$500,000 • **Minzhi Xing**, Society of Interventional Radiology (SIR) Foundation, *Interventional Radiology-Based Multidisciplinary Management versus Endoscopic Management of Malignant Biliary Obstruction: A Comparative and Cost-Effectiveness Population Study*, 1 year, \$30,000 • **Xiao Xu**, University of Pennsylvania (NIH), *Testing a Latino Web-Based Parent-Adolescent Sexual Communication Intervention*, 1 year, \$19,596 • **Hitten Zaveri**, Triton Systems (DoD), *Cortical Modem Systems Integration and Packing*, 5 months, \$12,514 • **David Zenisek**, University of Texas (NIH), *Mechanisms of Neurotransmission in Vertebrate Retina*, 1 year, \$42,364 • **Jiangbing Zhou**, American Heart Association (Founders Affiliate), *Glyburide-Loaded Nanoparticles for Stroke Treatment*, 3 years, \$198,000 • **Jiangbing Zhou, Joseph Piepmeier**, Connecticut Innovations, *Patient Specific Neural Stem Cell Mediated Combination Therapy for Malignant Gliomas*, 4 years, \$750,000

Two on medical school faculty named to U.K.'s Royal Society

Professors of pharmacology and neuroscience receive Society memberships

Two Yale scientists have been named to the Royal Society, the United Kingdom's national academy of science. Mark A. Lemmon, PH.D., the David A. Sackler Professor of Pharmacology and co-director of the Yale Cancer Biology Institute, has been elected a Fellow. Pasko Rakic, M.D., PH.D., the Dorys McConnell Duberg Professor of Neuroscience and professor of neurology, is one of only 10 newly chosen Foreign Members.

The Society recognizes Lemmon's research into basic biochemistry and biophysics questions, which has yielded significant insights within the fields of cell signaling and cancer research. For much of his career,

Lemmon has studied the signaling mechanisms of cell surface receptor tyrosine kinases (RTKs) that, when mutated, cause cancers and other diseases.

His findings are helping to guide clinical decisions on which treatment best suits each individual patient. They bring biochemistry and structural biology into personalized medicine by explaining the variety of ways in which different mutations activate the cancer-related proteins in which they are found.

In the early 1990s, Lemmon pursued M.S. and PH.D. degrees in molecular biophysics and biochemistry at Yale with Donald Engelman. He completed his postdoctoral studies at New York University Medical



Mark Lemmon



Pasko Rakic

Center's pharmacology department under the mentorship of Joseph Schlessinger, PH.D., now chair of pharmacology and William H. Prusoff Professor of Pharmacology at Yale.

Lemmon was the George W. Raiziss Professor of Biochemistry and Biophysics and department chair at the University of Pennsylvania Perelman School of Medicine before he returned to Yale in 2015.

Throughout his distinguished career, Rakic has dedicated himself to brain development research. The Society commends his insights into the cellular and molecular mechanisms of neuronal proliferation, migration, and synaptogenesis that occur during the evolution of the cerebral cortex.

He has shown that axons, synapses and neurotransmitters are overproduced before declining to adult levels by a process of competitive selective elimination, and added insight into genetic and environmental causes of congenital brain disorders.

Rakic was recruited to Yale from Harvard's faculty by George Palade in 1979, to establish what then was called the Section of Neuroanatomy. In 2001 the section became the Department of Neurobiology, which he continued to chair until 2015 when it became the Department of Neuroscience. Rakic also founded the Kavli Institute for Neuroscience at Yale and remained its director until 2015.

His honors include membership in the National Academy of Sciences, the National Academy of Medicine, and the American Academy of Arts and Sciences. In 2008, he was awarded the inaugural Kavli Prize in Neuroscience.

National Academy of Sciences taps professor for research breadth

Frederick J. Sigworth, PH.D., professor of cellular and molecular physiology, and of biomedical engineering, has been elected to the National Academy of Sciences (NAS) in recognition of his distinguished and continuing achievements in original research.

He is among 84 new members and 21 foreign associates from 14 countries selected for membership. The new members were announced May 3. Election to membership in the Academy is considered one of the highest honors that can be afforded to a U.S. scientist or engineer.

Sigworth's research unravels the workings of ion channel proteins, the "molecular machines" that switch on and off electrical currents that are carried by ions across biological membrane proteins. His lab at Yale is pursuing new approaches to obtain 3D structures of these proteins.

According to Sigworth, ion channels have a special significance to multiple areas of inquiry. They are best known, he notes, for their role in the electrical activity of nerve cells, but diabetes medications, novocaine



Frederick Sigworth

and anti-epileptic drugs, as well as snake and spider toxins, all act on ion channels. Such disorders as cystic fibrosis, cardiac arrhythmias, and certain forms of hypertension and kidney disease all arise from ion channel defects.

Steven M. Girvin, PH.D., deputy provost for science and technology,

says Sigworth's work advancing new methods in electron microscopy is an example of "the depth and breadth of scientific inquiry going on at Yale."

Sigworth will be formally inducted at next year's NAS annual meeting. The NAS is a private, non-profit institution established under a congressional charter signed by President Abraham Lincoln in 1863. Its charge is providing independent, objective advice to the nation on matters that are related to science and technology.

// **Professorship** (from page 1) approach, published in 2003 in *Archives of Internal Medicine*.

Dan Adams' relationship with Yale had an unusual beginning. He was accepted to Yale College but chose Cornell, where he majored in chemistry and minored in physics. It was, he says, an act of "adolescent rebellion" against a father who dearly wished for him to go to Yale. He later earned a law degree from New York University and practiced law on Wall Street, but after a tour as an Army captain and company commander in Southeast Asia during the Vietnam War he decided he was better suited to running companies.

He would found and manage five biopharmaceutical companies that have a combined market value of over \$70 billion. Adams saw vaccines as a tremendous business opportunity, because manufacturing methods cried out to be modernized and "vaccines are the most efficient form of health care," he says.

Amanda Adams did attend Yale College, and her time there was eventful. She was diagnosed with cancer during her freshman year. Vincent T. DeVita Jr., M.D., the Amy and Joseph Perella Professor of Medicine and professor of epidemiology, and then director of Yale Cancer Center, took charge of her case.

Amanda never needed to take a medical leave during treatment, she recalls. Her clinicians cheered her on to success throughout her four years as she played varsity ice hockey, a family passion. "Everyone was wonderful, across the board," she says. Now, O'Connor and Dan Adams have adjacent seats at Yale hockey games.

O'Connor's career has been strongly rooted at Yale. He came to the School of Medicine in 1986 as a Robert Wood Johnson Clinical Scholar. He received his M.P.H. from the School of Public Health after first earning a medical degree at the Albany Medical College and completing a residency at the University of Rochester School of Medicine.

O'Connor has been a consultant to the White House Office of National Drug Control Policy and co-hosted a White House symposium on addiction last year. He will speak there again this fall. He has been president of the Association for Medical Education and Research in Substance Abuse, and is a founding director and past president of the American Board of Addiction Medicine.

The medical school's section of general internal medicine has grown dramatically through O'Connor's recruitment of talented physician-scientists and clinician educators, and its research portfolio has grown tenfold.

New Appointments

Eight professors have been named to established endowed professorships.



Haifan Lin, PH.D., becomes Eugene Higgins Professor of Cell Biology. Lin also is a professor of genetics and of obstetrics, gynecology, and reproductive sciences; and director of the Yale Stem Cell Center.



Stephan Ariyan, M.D., M.B.A., has been named the Frank F. Kanthak Professor of Surgery. In addition, he is a professor of dermatology.



Tian Xu, PH.D., becomes C.N.H. Long Professor of Genetics. He also is a professor of neuroscience.



Akiko Iwasaki, PH.D., has been named Waldemar Von Zedtwitz Professor of Immunobiology. Iwasaki is also a professor of molecular, cellular and developmental biology.



Craig Russell Roy, PH.D., is now Waldemar Von Zedtwitz Professor of Microbial Pathogenesis. Roy is a professor of immunobiology.



David G. Schatz, PH.D., becomes Waldemar Von Zedtwitz Professor of Immunobiology. Schatz is also professor of molecular biophysics and biochemistry, and chair of immunobiology.



Jeannette R. Ickovics, PH.D., is now the Samuel and Liselotte Herman Professor of Social and Behavioral Sciences in the Yale School of Public Health.



Christian Tschudi, PH.D., has been named the John Rodman Paul Professor of Epidemiology in the Yale School of Public Health.