

## A stalwart partner is awarded medical school's highest honor

*Foundation's support has fueled Yale science for two decades and counting*

In recognition of more than two decades of outstanding support for biomedical research at Yale School of Medicine, the G. Harold and Leila Y. Mathers Charitable Foundation has received the Peter Parker Medal, the school's highest honor.

The foundation's farsighted vision of supporting basic science research has contributed to the work of 15 Yale researchers, ranging from promising new investigators at the outset of their careers to Nobel laureates at the

pinnacle of their fields. At a ceremony in March, Dean and Ensign Professor of Medicine Robert J. Alpern, M.D., praised the foundation's loyalty to Yale. "You are committed to making the world better," Alpern said.

The foundation has contributed more than \$17.5 million since 1989, paving the way for a number of significant advances and programs. Recently, the foundation awarded grants of \$1.5 million and \$1.7 million to research projects by Joerg Bewersdorf, PH.D., associate professor of cell biology, and Haifan Lin, PH.D., professor of cell biology and genetics, respectively.

Bewersdorf, also associate professor of biomedical engineering, is a leader



Trustees of the G. Harold and Leila Y. Mathers Charitable Foundation joined Dean Robert Alpern (fourth from left) for a ceremony in March. For its longtime support, the foundation received the school's Peter Parker Medal.

in developing light microscopes that allow the visualization of proteins and membranes within cell organelles

and molecular machines with unprecedented precision. The new funding will support his

// Medal (page 7)

## A family, and a transformative legacy



*Gift from a 'steadfast friend' to fund three professorships at the School of Medicine*

Richard S. Sackler, M.D., is no stranger to the School of Medicine. A member of the Dean's Council and the Yale Cancer Center (YCC) Director's Advisory Board, Sackler also has a robust track record of philanthropy, which has shaped the School of Medicine in tangible ways.

In 2009, Sackler, along with his wife, Beth, and his brother and sister-in-law, Jonathan Sackler and Mary Corson, joined forces to donate \$3 million to establish the Richard Sackler and Jonathan Sackler Professorship in Internal Medicine, held by Thomas J. Lynch Jr., M.D., director of YCC and physician-in-chief at Smilow Cancer Hospital at Yale-New Haven.

Now, a new commitment by Richard Sackler and his children, Rebecca, Marianna, // Legacy (page 4)

Richard Sackler (center) is joined by Dean Robert Alpern (left) and Thomas Lynch (right), the Richard Sackler and Jonathan Sackler Professor of Medicine and director of Yale Cancer Center.

## In giving back, supporting research in women's health

When Wendy U. and Thomas C. Naratil, of the Yale College Class of '83, signed on to co-chair their class's 30th college reunion last year, they knew they wanted to make a gift to the university that would have a significant and lasting effect. Since the late 1990s the Naratils have had a relationship with Women's Health Research at Yale (WHRY), a program whose mission includes ensuring that women are included in research studies, gender differences in health are examined, and health outcomes are analyzed by gender.

In an effort not only to spearhead their class's reunion campaign, but also to advance WHRY's mission, the Naratils have given \$1 million to establish an endowment that will offer significant support annually for pilot research in women's health and gender differences. The Wendy U. and Thomas C. Naratil Pioneer Award in Women's Health Research will provide up to \$50,000 to one faculty member each year.

WHRY was founded in 1998 with funding // Women's Health (page 8)

**2 Lifelines**

By treating medicine as an information science, cardiologist Harlan Krumholz brings a "big data" approach to patient care.

**3 One-stop shop for researchers**

The Yale Center for Clinical Investigation provides resources and services that guide scientists through the research process.

**5 Bridging the health care gap**

A new center aims to identify and reduce persistent health care inequalities.

**ALSO**

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Harlan Krumholz

Among Harlan Krumholz's diverse research projects is a study to identify the factors underlying the health and survival of young women, aged 30 to 55, who suffer from heart attacks, and how the patients' gender may influence those factors, symptoms, and quality of care.

TERRY DAGRADI

## Outside the box

### Taking the less trodden route, a cardiologist aims for systematic fixes

When Harlan M. Krumholz, M.D., S.M., was a young academic cardiologist in the early 1990s, colleagues advised him to pick a niche, like echocardiography or atrial fibrillation. But Krumholz, the Harold H. Hines Jr. Professor of Medicine, was interested in questions that transcended specialty: How can we measure outcomes to improve care? How can we bring hidden clinical insights into the open? "I was drawn to a bigger picture—how things are connected, how we can best learn to help patients," he says.

Today, Krumholz's interdisciplinary work puts him at the center of efforts to improve health care in the U.S. He founded the Yale-New Haven Hospital Center for Outcomes Research and Evaluation, which, among other activities, helps develop the Centers for Medicare & Medicaid Services' hospital performance measures. His Yale Open Data Access Project has persuaded major companies to share proprietary clinical trial data—a huge win for scientific transparency.

Cardiology has forgiven Krumholz for not sub-specializing. He won the

American Heart Association's Distinguished Scientist Award in 2010. In 2008 he was elected to the Institute of Medicine of the National Academies. *Forbes* has called him "The Most Powerful Doctor You Never Heard Of."

As a Yale undergraduate, Krumholz evaluated rural health centers, making him think about how medicine involves larger social systems. Few medical researchers held that holistic perspective at the time, but Krumholz recalls one who did.

As a Harvard medical student he attended a talk about collecting data on chest pain patients to develop admission guidelines. The speaker was Lee Goldman, M.D., M.P.H., now dean of the Faculties of Health Sciences and Medicine at Columbia University Medical Center, a pioneer in applying quantitative public-health methods to improve decisions in clinical medicine. "I asked him to be my advisor," Krumholz says. After completing his residency in internal medicine at the University of California—San Francisco in 1989, Krumholz returned to Harvard for a cardiology fellowship, where Goldman's support helped launch his research career.

On joining the Yale faculty in 1992, Krumholz found opportunities to pursue his interests outside the

academy via a relationship with the nonprofit Connecticut Peer Review Organization, now Qualidigm. At the time, the organization was embarking on a national effort to evaluate the quality of care for Medicare patients. "I'm jumping up and down saying, 'Count me in!,'" he recalls.

Krumholz, also professor of investigative medicine and public health, has a knack for finding insight in unexpected places. A bout of jet lag after a flight from China made him wonder if sleep disruption and malnourishment might explain why patients often get sick after a hospitalization. Last year he published a paper describing post-hospital syndrome—heightened vulnerability to accidents and illness following hospital discharge.

Today, he says, "medicine needs to learn how other industries manage data." The goal is—as it has always been for Krumholz—better patient care. If Amazon can predict purchases so accurately that workers can pack shipments before the customer decides, Krumholz asks, why couldn't doctors sift data buried in thousands of charts to predict a heart attack—and then preempt it?

"That's what's fun about what I do," he says: "You have ideas and you think, 'Could that work in medicine?'"

## Acclaimed surgeon is new chief of vascular surgery



Timur Sarac

Timur P. Sarac, M.D., an acclaimed surgeon and national leader in vascular surgery, has joined the School of Medicine as professor of surgery and

chief of the Section of Vascular Surgery. He also serves as director of the residency program and co-surgical director of the Heart and Vascular Center at Yale-New Haven Hospital (YNHH).

Sarac, whose appointment began April 1, comes to Yale from the Cleveland Clinic. He succeeds Bauer E. Sumpio, M.D., Ph.D., professor of surgery and diagnostic radiology, a renowned vascular surgeon who has led the Section of Vascular Surgery since 1995.

"Dr. Sarac is not only a spectacular surgeon, but also an international leader in vascular surgery," said Robert Udelsman, M.D., M.B.A., chair and William H. Carmalt Professor of Surgery and surgeon-in-chief at YNHH.

Sarac's areas of specialization include endovascular surgery for aortic aneurysms, lower extremity occlusive disease, carotid stenting, and mesenteric ischemia. He is experienced in open re-operative vascular surgery, and holds more than 20 national and international patents for the development of novel stent technology. He was awarded a U.S. Army commendation medal for his innovative approach with military endovascular disease.

Sarac earned his M.D. at the University at Buffalo School of Medicine and Biomedical Sciences. He completed his residency and a fellowship in general surgery at the University of Rochester Medical Center, and a fellowship in vascular surgery at the University of Florida's College of Medicine.

## Yale Cancer Center joins alliance of world's leading cancer centers

In March, Yale Cancer Center (YCC) and Smilow Cancer Hospital at Yale-New Haven joined the National Comprehensive Cancer Network (NCCN), an alliance of 25 of the world's leading cancer centers dedicated to improving the quality, effectiveness, and efficiency of care provided to patients with cancer.

Since its opening in 2009, Smilow Cancer Hospital has become a hub for effective cancer care, complementing YCC's dedication to innovation in cancer research and the development of novel treatments. Together, YCC and Smilow Cancer Hospital have pioneered many novel approaches to

cancer therapy, and YCC research has contributed to significant advances in personalized medicine. YCC joined a study overseen by the National Cancer Institute (NCI) that matches patients to clinical trials of new therapies targeted to their cancer's specific genetic mutations. YCC researchers are also advancing immunotherapy treatments for melanoma, using the body's immune system to fight cancer.

"The collaboration of over 450 scientists and physicians at Yale focused on cancer research and patient care provides a strong foundation for breakthroughs in cancer prevention,



Thomas Lynch

diagnosis, and treatment," said Thomas J. Lynch Jr., M.D., director of YCC, Richard Sackler and Jonathan Sackler Professor of Medicine, and physician-in-chief at Smilow Cancer Hospital. "We are honored to be elected to NCCN institutional membership."

YCC is one of 41 NCI-designated comprehensive cancer centers in the U.S. Its designation was recently extended for an additional five years.

## Medicine@Yale

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## Behind the tics of Tourette's syndrome



ISTOCKPHOTO

In 2010 a Yale team discovered a shared mutation in the histidine decarboxylase (*HDC*) gene in nine members of a family with Tourette's syndrome—a disorder characterized by repetitive motor and vocal tics. The mutation disrupted the production of the immune molecule histamine, the team reported in the *New England Journal of Medicine*.

New research published Jan. 8 in *Neuron* strongly implicates the mutation as being responsible for the family's Tourette's. A Yale team found that mice with the same mutation developed Tourette's-like symptoms. Mice that had mutations in or lacked the gene exhibited repetitive movements, but when given supplemental histamine, their symptoms lessened.

"These findings give us a new window into what's going on in the brain in people with Tourette's," said Christopher Pittenger, M.D., Ph.D., associate professor of psychiatry and psychology and in the Child Study Center and senior author of the study. "That's likely to lead us to new treatments," Pittenger said.

## Tick guts key to Lyme disease spread

The prevalence of Lyme disease varies greatly among locales in the Northeastern U.S., even though the deer ticks that transmit the disease are common throughout the region. Now, scientists may have a better idea why.

A team led by Erol Fikrig, M.D., Waldemar Von Zedtwitz Professor of Medicine, and professor of epidemiology and microbial pathogenesis, and a Howard Hughes Medical Institute investigator, has found clues as to Lyme's uneven prevalence: when a feeding tick ingests *Borrelia burgdorferi*, the bacterium that causes the disease, the bacteria's survival depends on microbes in the ticks' guts.

To control their gut contents, Fikrig's team raised *Ixodes scapularis* tick larvae in germ-free containers. When the mature ticks fed on *B. burgdorferi*-infected animals, they ingested more blood, but carried less bacteria, than ticks reared in normal conditions. The ticks with altered gut microbes had lower levels of STAT, a protein key to maintaining the gut's immune system and repair mechanisms. In turn, the gut's lining was altered, and *B. burgdorferi* had a harder time colonizing it.

The findings, published Jan. 15 in *Cell Host & Microbe*, may explain the influence of environment on disease incidence and could lead to new ways to stop the spread of *B. burgdorferi*.

# Translating research from mice to men

*The largest federal grant in the medical school's history provides scientists with tools to move their research from bench to bedside*

As both a psychiatrist and a neurobiologist, Christopher Pittenger, M.D., Ph.D., is interested in how biological changes in the brain contribute to such psychiatric conditions as obsessive compulsive disorder (OCD) and Tourette's syndrome. In the lab, he wanted to investigate cellular and molecular abnormalities in the brain that are associated with disease—and to find out how these changes affected the behavior of his patients.

Pittenger, associate professor of psychiatry, of psychology, and in the Child Study Center, was able to translate his research from bench to humans thanks to support from the Yale Center for Clinical Investigation (YCCI).

Launched in 2006 as part of the medical school's strategic vision to strengthen clinical and translational research, YCCI provides an array of resources to support research as well as a home for the training of the next generation of investigators. In 2006, the School of Medicine was among the first 12 institutions in the U.S. to receive a five-year Clinical and Translational Science Award (CTSA) of \$57.3 million, the largest NIH grant in the school's history. The CTSA has since been renewed for an additional \$47.5 million. This funding, with additional support from the School of Medicine, has allowed YCCI to develop new and enhanced programs, resources, and services to advance biomedical research.

The number of research grant applications to the National Institutes of Health (NIH)—the largest source of funding for medical research globally—has increased by 72 percent since 2000, but in 2013, the success rate for established investigators applying for R01-equivalent awards was just 15 percent, according to the NIH data book. For first-time investigators the success rate was even lower—13 percent—an illustration of the difficulties young researchers face. Pittenger, also director of the Yale OCD Research Clinic, made this leap thanks to a 2009 YCCI Scholar award, which provided two years of research support for imaging studies on the neurotransmitter glutamate in OCD patients. "I didn't know enough and didn't have enough of a published track record to get major external grants in clinical research at that time," he says.

The Scholar program is the cornerstone of the educational programs under YCCI's umbrella and is particularly important to fulfilling its goal of nurturing investigators early in their careers. "Building the next generation of investigators is critical, and it's the most efficient way of sustaining research excellence at Yale," says Robert S. Sherwin, M.D., C.N.H. Long Professor of Medicine, chief of the Section of Endocrinology, and director of YCCI.

The program has proven to be a sound investment: so far, over 90 percent of the 88 Scholars who have received awards have remained in academic medicine, generating \$157 million in independent funding and publishing more than 1,000 papers. "Without the YCCI award I wouldn't have been able to grow the clinical side of my research program, which is now half of my research portfolio," says Pittenger, who also serves as a mentor to younger colleagues embarking on research careers. YCCI oversees the Investigative Medicine Program, one of a handful of programs in the U.S. offering a Ph.D. in investigative medicine for physicians who have completed their clinical training, and has expanded it to include scholars in nursing, public health, and biomedical sciences who want to pursue research. YCCI also supports about a dozen medical students annually to take a year off to work on research projects.

Before YCCI was established, investigators and departments were largely left to their own devices, since the School of Medicine lacked a centralized facility that offered the know-how needed to put together grants and conduct research studies. "Investigators need infrastructure with one-stop shopping resources," says Sherwin, who is renowned for his research on diabetes. "This is critical so that investigators are able to focus on the science and get help on the things we're not really trained to do." YCCI's Office of Research Services helps both experienced and novice investigators throughout the research process,

offering expertise in developing study protocols, navigating regulatory requirements, developing budgets, recruiting study volunteers, supplying nursing and other research staff, and providing quality assurance.

One example of how YCCI facilitates research is the biostatistical support offered through the Yale Center for Analytical Sciences (YCAS). Created in partnership with the School of Public Health in 2010, the more than 30 biostatisticians affiliated with the Center provide assistance with statistical analyses, a crucial element in successfully carrying out research. For 2008 YCCI Scholar Leora I. Horwitz, M.D., M.H.S., assistant professor of medicine, whose research on the transition of care when patients are discharged from the hospital has earned her a national reputation, YCAS biostatisticians were instrumental in



Almost \$200 million of Yale's yearly National Institutes of Health grant support is connected to the Yale Center for Clinical Investigation (YCCI). YCCI's leadership includes (from left) William Tamborlane, Kevan Herold, Tesheia Johnson, and Robert Sherwin, as well as Marcella Nuñez-Smith and Rajita Sinha (not pictured).

helping her develop the statistical section of her NIH Career Development award. "Having that resource makes all the difference," Horwitz says.

Since 2007, YCCI has also provided almost \$3 million for 64 pilot awards that allow investigators to develop new scientific initiatives and compete successfully for further funding. Pittenger received a pilot award for research showing that a genetic mutation that disrupts the production of histamine in the brain is a cause of Tourette's syndrome. "YCCI is a place where I was able to get funding for exciting ideas at an earlier stage than I could otherwise have gotten," says Pittenger, whose research originally funded by his Scholar award led to a major NIH grant that is enabling him to continue his work on OCD.

The pilot program, just one example of the benefits of YCCI's collaborative approach, has built its successes by leveraging existing resources and collaborating with other programs. For example, much of YCCI's regulatory and administrative support structure is intertwined with Yale Cancer Center (YCC). The two centers have collaborated to support YCAS as well as equipment and faculty expertise in research cores utilized for

// Translational Research (page 8)

## Creating a legacy

A gift from Henry Bronson, who received his M.D. in 1827, established the school's first named professorship, an endowment created in 1870 that supports members of the faculty to this day. The named professorship is the highest form of recognition for a physician-scientist, distinguishing its holder as a leader in medicine. Bronson's legacy forever remains in the achievements of the faculty honored as Bronson Professors.

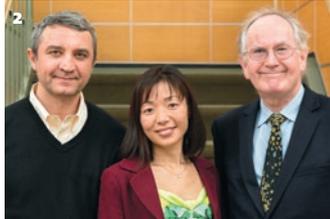
An endowed professorship helps us to attract and retain the most outstanding scientists and physicians. Robert S. Sherwin, M.D., the C.N.H. Long Professor of Medicine (profiled above), has had success in the lab and the clinic thanks to the substantial and reliable flow of funds for research, clinical, and teaching activities generated by the endowment. The School of Medicine is privileged to count among its faculty, innovators who solve today's most pressing medical issues. Endowed professorships help move science, and Yale, forward.

To learn more about how you can endow a named professorship at the School of Medicine, contact Charles Turner, associate vice president for development and director of medical development at (203) 436-8560 or charles.turner@yale.edu.

## OUT & ABOUT

**January 31** A **25th Anniversary Symposium** was held to mark the Department of Immunobiology's silver anniversary, drawing former department affiliates back to the medical campus.

**1.** (From left) Department alumni **Tim Zheng**, PH.D., **Eric S. Hoffman**, PH.D., and **Naveen Bangia**, PH.D. **2.** (From left) **Ruslan M. Medzhitov**, PH.D., the David W. Wallace Professor of Immunobiology; **Akiko Iwasaki**, PH.D., professor of immunobiology and of molecular, cellular, and developmental biology; and **Richard A. Flavell**, PH.D., chair and Sterling Professor of Immunobiology. **3.** (From left) M.D./PH.D. student **Daniel Okin** '15, M.D./PH.D. student **Raj Chovatiya** '16, **Tatiana Bondar**, PH.D., postdoctoral fellow in immunobiology, **Xu Zhou**, PH.D., postdoctoral fellow in immunobiology, and **Scott Pope**, PH.D., postdoctoral fellow in immunobiology, are members of the Medzhitov lab.



TERRY DAGRADI (3)



JOHN CURTIS (3)

**February 21** At this year's **Second Year Show**, "The Greatest Second Year Show Ever?", the Class of 2016 carried on a 65-year tradition, poking fun at the medical school's faculty and administration. **1.** **Jacob Weatherly** '16 as August H. Fortin VI, M.D., M.P.H., associate professor of medicine, with (back, from left) **Ezra Baraban** '16, **Jason Sandler** '16, **James Smithy** '16, and **Hannah Dzimitrowicz** '16, in one of the dance numbers. **2.** **Mary Barden** '16 plays Nancy R. Angoff, M.P.H., M.D., M.ED., associate professor of medicine and associate dean for student affairs. **3.** **Fritz Stabenau** '16 as "The Elder."

// **Legacy** (from page 1) and David, promises to continue to shape the medical school: in March, Sackler and his children established The Richard Sackler Family Endowment in Medicine. Funded by a gift of stock donated by Sackler in 2009, the Endowment will support three named professorships—one in the Department of Neurobiology, and two in fields yet to be determined.

"The Sackler family's commitment to advancing science at Yale is impressive and inspiring," said Robert J. Alpern, M.D., dean and Ensign

Professor of Medicine. "Endowed professorships form the core of our tradition of academic distinction and enable us to support the best and brightest researchers and clinicians throughout the school. In a time of decreased federal funding, Richard Sackler has been a steadfast friend of the medical school."

Sackler, an adjunct professor of genetics at Rockefeller University, earned his B.A. from Columbia College and his M.D. from the New York University School of Medicine, and completed a residency in internal

**February 10** The 2014 **David J. Leffell Prize for Clinical Excellence** was awarded to **Leo M. Cooney Jr.**, M.D., Humana Professor of Medicine (center). The annual prize was established in 2008 by a gift from **David J. Leffell**, M.D., the David Paige Smith Professor of Dermatology and professor of surgery (right), and his wife, Cindy, to recognize a faculty member who best exemplifies clinical expertise, a commitment to teaching, and the highest standards of care and compassion for patients. Pictured with Cooney and Leffell is Dean and Ensign Professor of Medicine **Robert J. Alpern**, M.D.



TERRY DAGRADI

**March 21** Each spring, fourth-year students at medical schools across the country eagerly await **Match Day**, when students receive word of acceptance in residency training programs. **1.** (From left) **Amy Moreno**, **Charisse Mandimika**, and **Maria Beth Koenigs**. **2.** (From left) **Alexander Arzeno** and **Joseph Thomas Patterson**. **3.** (From left) **Ryan Aronberg**, **Katherine Davis**, **Lauren Hibler Carlos**, and Carlos' husband, **Jonathan Carlos**.



JOHN CURTIS (3)

**April 26** A **Neuroscience Symposium** was organized by the Department of Psychiatry at the Mary S. Harkness Auditorium. Pictured are (from left) **Tyrone Cannon**, PH.D., professor of psychology; **Patricia Rehmer**, M.S.N., commissioner of the Connecticut Department of Mental Health and Addiction Services; **Elyn R. Saks**, J.D., PH.D., Orrin B. Evans Professor of Law, Psychology, and Psychiatry and the Behavioral Sciences at University of Southern California, Gould School of Law; **Marisa Walls**, president of the Board of Directors, National Alliance on Mental Illness, Connecticut Chapter; **Joan Kaufman**, PH.D., associate professor of psychiatry and in the Child Study Center; **Morris D. Bell**, PH.D., professor of psychiatry; **John H. Krystal**, M.D., the Robert L. McNeil Jr. Professor of Translational Research, chair of psychiatry, and professor of neurobiology; **Judson A. Brewer**, M.D., PH.D., assistant professor (adjunct) of psychiatry.



TERRY DAGRADI



COURTESY OF ALLEN SHIH

**April 27** Students and faculty flexed their muscle at the **Student/Faculty Tennis Classic**, held at Yale's Cullman-Heyman Tennis Center. This spring, 53 people participated in the tournament, which consisted of three rounds of one-set matches. Following the tournament, Dean and Ensign Professor of Medicine Robert J. Alpern, M.D., hosted a dinner for the event's participants.

medicine at Hartford Hospital. He is a co-chairman of Stamford, Conn.-based Purdue Pharma and a director of Mundipharma and Napp Pharmaceuticals, both of Cambridge, U.K.

The Sackler family's philanthropy has benefited institutions around the world, and has touched Yale in a number of ways. Among them, Sackler's parents, Beverly and Raymond Sackler, M.D., established the Raymond and Beverly Sackler Institute for the Biological, Physical and Engineering Sciences in 2008. Also at Yale, they have supported archeological

excavation work and age-related macular degeneration research, and established the Raymond and Beverly Sackler Visiting Professor/Lecturer at the School of Medicine. "My father raised [my brother] Jon and me to believe that philanthropy is an important part of how we should fill our lives," Richard Sackler said.

Sackler's daughter Rebecca, a 2012 graduate of Yale College, is continuing the family's tradition in the sciences as a student at the University of California-Davis School of Veterinary Medicine.

## A genetic cause for metabolic syndrome



Not only are coronary artery disease and diabetes leading causes of death worldwide, but metabolic syndrome, a cluster of risk factors for these diseases, is on the rise. Thanks to new Yale research, scientists may now have a better handle on the problem.

A team led by Arya Mani, M.D., associate professor of medicine and genetics, looked at families with abdominal obesity, coronary artery disease, hypertension, and diabetes. Using techniques including linkage analysis and whole-exome sequencing, the team found a mutation in the *Dyrk1B* gene in family members with the syndrome. The gene codes for an enzyme that regulates muscle-to-fat balance and stabilizes glucose levels. Individuals with the mutation displayed increased *Dyrk1B* activity and a lower muscle-to-fat ratio.

The study, published May 15 in the *New England Journal of Medicine*, is the first to find a single mutation behind the myriad of risk factors that comprise metabolic syndrome. “The mutated gene is a great target for potential therapeutics,” Mani says.

## How aging slows neuron repair

In young animals and humans, injuries to nerve cells don't have to lead to long-term damage because the youthful nervous system is relatively effective at repairing itself. But in adults this repair system falters, and nerve injury more often results in lasting effects.

To understand why aging reduces a neuron's ability to regenerate, Alexandra B. Byrne, PH.D., postdoctoral fellow, Marc Hammarlund, PH.D., assistant professor of genetics, and colleagues turned to the tiny worm *C. elegans*. In young worms, the team found, 65 percent of axons—the long extensions of nerve cells—regenerated after injury. But in older animals, only 28 percent of injuries spurred regeneration.

Focusing on which signaling pathways are required for axon regeneration—and which are altered by aging—the team found that a pathway related to insulin was key to the change in older worms. But the pathway's effects on neuron regeneration, they reported Feb. 5 in the journal *Neuron*, could be separated from aging: the regenerative abilities of older animals could be boosted by tweaking levels of the genes involved. The research has implications for treating not only brain injuries, but also aging-associated brain diseases such as Alzheimer's disease.

# Continued clinical care for ex-convicts

*A clinical network tailored to the medical needs of ex-prisoners could reduce recidivism and strengthen the U.S. health care system*

People newly released from prison confront serious health risks the moment they step off the bus. Many lack identifying documents and have only a few dollars in their pockets. Many don't know how to find health insurance or medical care. And many quickly wind up in emergency departments with overdoses or exacerbations of chronic diseases that were being treated in prison. These are problems that Assistant Professor of Medicine Emily Wang, M.D., M.A.S., is trying to resolve.

While an internal medicine resident at the University of California—San Francisco, Wang decided to talk to current and former prisoners about these barriers. In 2006, she co-founded a San Francisco clinic based on what she learned. The Transitions Clinic Network (TCN) is designed to connect ex-prisoners with medical and social services as soon as they leave prison. Eight years after its founding, the TCN has grown to serve 13 locations around the country, including at Yale-New Haven Hospital's Primary Care Center.

TCN has drawn substantial national media attention, in part because of its help enrolling returnees under the Affordable Care Act (ACA)—or “Obamacare”—may strengthen insurance rolls as well as reduce recidivism. Wang and colleagues at the TCN meet regularly with President Obama's Federal Interagency Reentry Council to discuss policy barriers to returnee health, such as Medicaid termination for people incarcerated longer than a year.

Funded by a Career Development Award from the National Heart, Lung, and Blood Institute, Wang also studies health outcomes in returned prisoners. In September 2013 she reported in *JAMA Internal Medicine* that about one in 12 are hospitalized within three months of release.

The structure of the TCN is based on advice from current and former prisoners, who suggested to Wang that effective medical care for returnees needs four key elements: early access to primary care; workers with a history of incarceration to guide returnees to medical and social services; providers with correctional health experience or training; and strong connections to community

organizations like housing, employment, and legal aid. Returnees have also alerted Wang to discrimination in the health care setting.

“A big problem in many of the interventions that are designed for this population is that often they haven't solicited the opinion of former prisoners,” Wang says. “You end up with interventions that either aren't palatable or aren't feasible.”

By contrast, the TCN is succeeding. When Wang and her colleagues compared returnees receiving all four elements of the TCN's care to returnees receiving just an early primary-care visit, they found that only one-quarter of TCN patients visited the emergency department in a year compared with 40 percent of non-TCN patients. The results appeared in the *American Journal of Public Health* in September 2012.



Emily Wang

Though medical care for prisoners is mandated under the Eighth Amendment of the U.S. Constitution, that care often abruptly ends when imprisonment does. The clinic makes it possible to access prison health records and resume care. In 2012 the TCN received a Health Care Innovation Award from the Center for Medicare and Medicaid Innovation. The program has been mentioned in *The Atlantic*, *Newsweek*, and *CNN.com*.

Some of the attention has centered around the TCN's connections to Medicaid and the ACA. Poor health care in the form of untreated mental health problems and addiction lead many people to offend in the first place. So getting ex-prisoners enrolled in Medicaid—and making sure they receive treatment tailored to their needs, as the TCN does—might mean fewer of them return to prison.

“Obamacare is key to reducing recidivism,” Wang says. She adds, however, that the reverse is also true. Over one-fifth of people eligible for Medicaid under the ACA expansion are incarcerated, on probation, or on parole. Many are young and healthy, making them attractive to insurance companies looking to dilute their risk pools. Far from being burdensome, then, these individuals may strengthen the health care system—much as their involvement has made the TCN more effective.

“In order for the Affordable Care Act to work,” Wang says, “you have to get former prisoners involved.”

## Reducing health care inequalities is focus of new research center

Many health care systems in the U.S. and abroad suffer from significant variation in quality and patient outcomes. With the July 1 launch of the new Equity Research and Innovation Center (ERIC), however, the School of Medicine is home to a new hub of activity focused on closing stubborn gaps in health care delivery and outcomes. Launched by Marcella Nuñez-Smith, M.D., ERIC aims to reduce health care inequities that disproportionately affect minority and low-income populations.

“The sad reality is that despite all the research and knowledge that has been advanced, disparities in health and health care outcomes persist, and some of the gaps have increased over time,” says Nuñez-Smith, associate professor of medicine and of epidemiology and public health and the new center's executive director. “ERIC is laser-focused on asking the questions and looking for the answers that have direct implications for closing these gaps,” she says.

To best obtain these answers, ERIC's goals include developing and disseminating research that informs evidence-based policy and practice, and serving to support Yale students, faculty, and others interested in



conducting state-of-the-art health equity research.

The principal investigator of several federal and foundation awards, Nuñez-Smith leads a team of some 60 researchers from the School of Medicine and partner institutions across the globe. The center's flagship research project brings together 40 researchers located at remote research sites in Trinidad, the Virgin Islands, Puerto Rico, and Barbados. The multi-site cohort study will explore prevention and risk factors associated with non-communicable diseases, such as cancer, diabetes, and cardiovascular disease, in low- and middle-income Caribbean communities.

With initial financial support from the School of Medicine, ERIC is

**Marcella Nuñez-Smith (sixth from right) launched the Equity Research and Innovation Center to combat gaps in health care quality.**

building upon established research projects focused on diversity within the health care workforce and faculty promotion and retention in academic health centers. ERIC researchers are also working to develop new measurement approaches to capture the patient care experience.

“We will continually ask if we are focusing on the right kinds of things, results-oriented research that can inform interventions,” Nuñez-Smith says. “We want to try new approaches that will advance the field, so the next generation of researchers can begin at a [more advanced] starting point.”

# Grants and contracts awarded to Yale School of Medicine

November 2012–June 2013

## Federal

**Herve Agaisse**, NIH, *Mechanisms of Vaccinia Virus Dissemination*, 2 years, \$442,773 • **Serap Aksoy**, NIH, *Molecular and Functional Characterization of Olfaction Genes in Tsetse Flies*, 2.9 years, \$159,096 • **Alfred Bothwell**, NIH, *Regulatory T Cell Mediated Control of Colitis by DKK1*, 2 years, \$442,831 • **Jessica Cardin**, NIH, *Inhibitory Regulation of Cortical Visual Processing*, 5 years, \$2,072,613 • **Owen Chan**, 4.9 years, \$187,211; **Pietro De Camilli**, 4.9 years, \$106,906; **Richard Flavell**, 4.9 years, \$331,768; **Robert Sherwin**, 4.9 years, \$6,597,675; **Gerald Shulman**, 4.9 years, \$178,782; **William Tamborlane**, 4.9 years, \$190,913; NIH, *Diabetes Research Center* • **Sandy Chang**, NIH, *Replicative Senescence as a Tumor Suppressive Mechanism*, 5 years, \$1,534,146 • **Chiayu Chiu**, NIH, *Inhibitory Regulation of Dendritic Calcium Signals in Prefrontal Cortex*, 3 years, \$370,292 **Daniel Colon-Ramos**, NIH, *Worm GUIDES: A Resource for Global Understanding in Dynamic Embryonic Systems*, 3.9 years, \$2,621,151 **Michael Crair**, NIH, *In Vivo Properties of Spontaneous Waves in the Retina and Developing Visual System*, 5 years, \$2,080,729 • **Jonathan Demb**, **Bart Borghuis**, NIH, *Optical Measurements of Excitatory Synaptic Function in Retinal Circuitry*, 2 years, \$432,535 • **Andrew Dewan**, DoD, *Identification of Association Between Genetic Factors and Asthma that are Modified by Obesity*, 2 years, \$292,777 **Andrew Dewan**, NIH, *Family-Specific Genetic Variants Contributing to Asthma Susceptibility*, 5 years, \$3,903,874 • **Ralph DiLeone**, NIH, *Neural Mechanisms of Prefrontal Influence on Food Intake*, 4.9 years, \$1,543,165 • **Daniel DiMaio**, NIH, *Role of Retromer-Mediated Retrograde Transport in HPV Entry*, 5 years, \$2,056,079 • **Gail D'Onofrio**, NIH, *Yale Drug Abuse, Addiction, and HIV Research Scholars (Yale-DAHRS)*, 5 years, \$2,472,989 • **Tore Eid**, NIH, *The Metabolome of Epileptic Seizures*, 2 years, \$418,472 • **David Fiellin**, **Amy Justice**, NIH, *Using the VACS Index to Track Health Outcomes Associated with Changes in Drug Use*, 3 years, \$1,194,595 • **Ariadna Forray**, NIH, *Progesterone for Postpartum Smokers: Feasibility, Breastfeeding and Infant Safety*, 2 years, \$469,451 • **Julie Gaither**, NIH, *Chronic Opioid Therapy and Patient Safety in HIV Infected and Uninfected Veterans*, 2 years, \$84,888 • **Jorge Galan**, NIH, *Predocotoral Training Program in Microbial Pathogenesis*, 5 years, \$1,121,765; NIH, *Host Cell Signaling Pathways Induced by Salmonella*, 5 years, \$2,439,012 • **Debtirtho Ghosh**, NIH, *Neuropeptide Modulation of C. elegans Light Avoidance Circuitry*, 2.5 years, \$113,580 • **David Glahn**, NIH, *2/2 Genetics of Brain Structure and Function*, 1.9 years, \$1,948,088 • **Peter Glazer**, NIH, *Cell-Penetrating Anti-DNA Antibody for Radiosensitization and Cancer Therapy*, 5 years, \$1,716,816 • **Daniel Goldstein**, NIH, *Nanotherapeutics for Combined Immunosuppression in Organ Transplantation*, 2 years, \$223,598 • **Andrew Goodman**, NIH, *Molecular Recognition of Vitamin B12 and Related Compounds in Human Gut Microbial Communities*, 4 years, \$1,135,926 • **Ya Ha**, NIH, *Structural Studies of GxGD Membrane Protease FlaK*, 3.9 years, \$1,224,079 • **Ann Haberman**, NIH, *Definition of Follicular Stromal Cell Subset Interactions with B Cells*, 2 years, \$166,375 **Michael Hines**, NIH, *Computer Methods for Physiological Problems*, 5 years, \$1,529,961 **Sergey Ivanov**, NIH, *Role of TrkC in Neurotropic Salivary Cancers*, 2 years, \$457,875 • **Suk-Won Jin**, **Jean-Leon Thomas**, **Michael Simons**, **Yibing Qyang**, NIH, *Bone Morphogenic Protein Signaling in Lymphatic Endothelial Cells*, 4 years, \$1,807,841 • **Susan Kaech**, NIH, *Regulation of Memory CD8 T Cell*

*Development*, 5 years, \$1,889,285 • **Arie Kaffman**, **Ralph DiLeone**, NIH, *Early Life Stress Impairs DG Formation by Down Regulating Autotaxin*, 2 years, \$457,750 • **John Krystal**, NIH, *Translational Neuroscience Optimization of GlyT1 Inhibitor*, 1 year, \$1,807,967 • **Gary Kupfer**, NIH, *Mechanistic Dissection of the Fanconi Anemia Pathway of DNA Damage Response and Repair*, 4 years, \$690,846 **Haifan Lin**, NIH, *Function of PIWI/Argonate Proteins in Spermatogenesis*, 5 years, \$1,830,828 **Angeliki Louvi**, NIH, *Molecular Mechanisms of Primary Microcephaly*, 5 years, \$1,727,181 **Charles Lusk**, NIH, *Genomic Regulation at the Nuclear Periphery*, 2 years, \$457,563 • **Sherry McKee**, NIH, *Phase-II Clinical Trial Evaluating Guanfacine for Smoking Cessation*, 2.9 years, \$2,079,714 • **Thomas Melia**, NIH, *Regulation of Autophagosome Membrane Dynamics by the AtgB Family of Proteins*, 4 years, \$1,373,692 **Edward Melnick**, DHHS, *Clinical Decision Support for Mild Traumatic Brain Injury*, 5 years, \$776,293 • **Joan Monin**, NIH, *Chronic Conditions and Mutuality of Care in Late Life Marriage*, 5 years, \$633,560 • **Walther Mothes**, NIH, *Retrovirus Cell-to-Cell Transmission*, 4.8 years, \$1,363,444; NIH, *Single Molecule Imaging of HIV Env*, 2 years, \$456,144; NIH, *Efficacy of Antiretroviral Inhibitors in HIV Cell-to-Cell Transmission*, 2 years, \$166,375 **Dhasakumar Navaratnam**, NIH, *BK Channels of Hair Cells*, 5 years, \$1,733,240 • **Linda Niccolai**, NIH, *Disparities in HPV Vaccine Completion: Identifying and Quantifying the Barriers*, 2 years, \$412,686 • **Michael Nitabach**, NIH, *Cellular Signaling in Sleep and Circadian Networks*, 1 year, \$497,595 • **Haakon Nygaard**, 1 year, \$162,764; **Stephen Strittmatter**, 1 year, \$1,871,051; **Christopher Van Dyck**, 1 year, \$851,611; NIH, *FYN Inhibition by APO530 for Alzheimer's Disease* • **Justin Paglino**, NIH, *Glioma Immunotherapy with Strategies Based on Autonomously Parvovirus MVMp*, 5 years, \$587,090 • **Anna Rhoades**, NIH, *Self-Association and Membrane Binding of Alpha-Synuclein*, 4.9 years, \$1,726,624 • **Mehran Sadeghi**, NIH, *Macrophage Elastase and its Imaging in Vascular Inflammation and Remodeling*, 4 years, \$2,029,277 • **Warren Shlomchik**, NIH, *cVl Resistance: Immune Selection, T Cell Ignorance or T Cell Exhaustion*, 3.9 years, \$1,644,927 • **Rajita Sinha**, NIH, *Preventing Childhood Obesity Through a Family-Based Mindfulness Intervention*, 1.9 years, \$428,873 **Albert Sinusas**, **Joseph Akar**, NIH, *Molecular Imaging Predicts Atrial Remodeling and Fibrillation Vulnerability*, 4 years, \$2,792,029 **Patrick Skosnik**, NIH, *Default Mode and Control Brain Networks in Cannabis Dependence, and Abstinence*, 2 years, \$390,225 **Megan Smith**, **Linda Mayes**, NIH, *Momba: A Smartphone Application to Promote the Mental Health of New Mothers*, 3 years, \$749,093 • **Edward Snyder**, NIH, *Recipient Epidemiology and Donor Evaluation Study III (REDS-III)*, 4 years, \$6,480,663 • **Dieter Soll**, NIH, *Studies of Transfer RNA*, 4 years, \$5,167,592 **Serena Spudich**, NIH, *Therapeutic Interventions during Acute Infection to Address the CNS Reservoir for HIV*, 5 years, \$2,500,569 • **Mario Strazabosco**, NIH, *CFTR Modulates Innate Immune Response in the Biliary Epithelium*, 4.9 years, \$1,810,418 • **Stephen Strittmatter**, NIH, *Functional Genomics of Axonal and Synapse Regeneration*, 2 years, \$1,429,222 • **Tami Sullivan**, National Institute of Justice/Department of Justice, *Criminal Protection Orders as Critical Strategy to Reduce Domestic Violence: The Impact of Orders on Victims' Well-Being/ Offenders' Behavior, & Children's Contact with Offending Father*, 3 years, \$753,081 • **Patrick**

**Sung**, NIH, *Mechanistic Dissection of the Fanconi Anemia Pathway of DNA Damage Response and Repair*, 4 years, \$690,847; NIH, *Roles of the RecQ Helicases BLM and RECQ5 in Genome Maintenance*, 4.9 years, \$2,044,701 **Cenk Tek**, NIH, *MPSY Naltrexone for Antipsychotic-Induced Weight Gain*, 5 years, \$2,296,341 • **Jeffrey Testani**, NIH, *Cardio-Renal Phenotype and Prognosis in Chronic Heart Failure*, 5 years, \$775,670 • **Benjamin Turk**, NIH, *Phosphorylation Networks Regulated by Energy Stress in Yeast*, 3.9 years, \$1,298,612 • **Anthony Van den Pol**, NIH, *Lull1 Parvovirus Targets Glioma*, 3 years, \$1,025,840 • **Penghua Wang**, NIH, *The Role of Interleukin 22 in West Nile Virus Pathogenesis in Mice*, 2 years, \$166,375 **Xiao-Jing Wang**, NIH, *Gated Sensori-Motor Mapping and Cortical Circuit Reconfiguration in Flexible Decision-Making*, 4.9 years, \$2,080,521 • **Dawn Wetzel**, NIH, *Targeting Entry Pathways in Leishmaniasis*, 3 years, \$397,124 • **Yong Xiong**, NIH, *Viral Hijacking of Host Membrane Trafficking Pathways*, 5 years, \$2,794,497 • **Wendell Yarbrough**, NIH, *Validated Modeling and Culture of Salivary Cancers*, 2 years, \$432,379; NIH, *Tumor Suppressor Qualities and Mechanisms of LZAP Activity*, 4 years, \$1,763,539 • **Tao Zheng**, **Zhou Zhu**, NIH, *Atopic Dermatitis and Its Relationship with the Development of Asthma*, 1 year, \$81,618 **Yixiao Zou**, NIH, *Inpp5f Regulates Central Nervous System Axon Regulation via Phosphoinositide Metabolism*, 2 years, \$56,544

## Non-federal

**Clara Abraham**, Broad (Eli and Edythe L.) Foundation, *Molecular Classification of 1BD Through Aggregating 1BD Genetic Associations Modulating PKR-Stimulated Pathways*, 1 year, \$110,000 • **Maysa Abu-Khalaf**, University of Michigan (NIH), *Phase III Randomized, Placebo-Controlled Clinical Trial Evaluating the Use of Adjuvant Endocrine Therapy +/- One year of Everolimus in Patients with High-Risk, Hormone Receptor-Positive and HER2/Neu Negative Breast Cancer (S1207)*, 2 years, \$2,550 **Heather Allore**, Brigham and Women's Hospital, *A Multimodality Intervention for Mobility Limitation in Older Americans*, 1.5 years, \$15,313 **George Anderson**, Women's & Children's Hospital at Brown Univ. School of Nursing, *Fetal and Neonatal Neurobehavior and Prenatal Antidepressant Exposure: The Child*, 1 year, \$20,846 • **Kara Bagot**, American Academy of Child and Adolescent Psychiatry, *Effect of Smoking Status and Gender and Pain Tolerance and Sensitivity in Adolescents During Acute Abstinence*, 1 year, \$20,000 • **Choukri Ben Mamoun**, Gates (Bill and Melinda) Foundation, *Interrogating Anti-Malarials Using Optogenetic Technology*, 1.5 years, \$100,000 **Thomas Biederer**, Mead Johnson Nutritional Group, *Measurement of Nutrient Effects on Neuronal Differentiation and Synaptogenesis in Cell Culture Assays*, 6 months, \$47,962 **Ranjit Bindra**, Joanna McAfee Childhood Cancer Foundation, *Creation of Inducible PAX3/7-FOXO1 Cell Lines for Synthetic Lethal Screening Studies*, 1.5 years, \$25,000 • **Linda Bockenstedt**, L2 Diagnostics, LLC, *A Lyme Disease Vaccine Using Newly Identified In Vivo Expressed Antigens*, 1 year, \$98,328 • **Daniel Boffa**, Epic Sciences, *A CTC Enumeration Product Phase II*, 2 years, \$123,705 • **Maria Bonarrigo**, State of CT, *MPSY Project Evaluation DMHAS Subaward*, 10 months, \$78,425 **Marcus Subenberg**, **Frank Slack**, **Narendra Wajapeyee**, **William Jorgensen**, Melanoma Research Alliance, *Epigenetics in Melanoma: Mechanistic Evaluation and Novel Therapies*, 2 years, \$500,000 • **Elizabeth Bradley**, Management Sciences for Health, *Sustainable Leadership, Management, and Governance-Tanzania*, 1.4 years, \$236,157; Mount Sinai School of Medicine, *The Impact of Hospice Preferred Practices on Patient Outcomes and Hospice Costs*, 1 year, \$73,976; Johnson (Robert Wood) Foundation, *Health and Social Service Spending and Health Outcomes: A State-level Analysis*, 8 months, \$85,231; Harvard School

of Public Health (Gates(Bill and Melinda) Foundation), *Developing the Long Term Capability of Ethiopia Health Care Extension Program Platform Phase II*, 1.4 years, \$411,533 **Elizabeth Bradley**, **Harlan Krumholz**, **Leslie Curry**, Commonwealth Fund, *Understanding Hospital Practices Among Hospitals Enrolled with the State Action on Avoidable Rehospitalizations (STAAR) Initiatives*, 2.5 years, \$479,999 **Debra Brandt**, University of Michigan (NIH), *NCIC MA.32.A Phase III Randomized Trial of Metformin vs Placebo on Recurrence and Survival in Early Stage Breast Cancer*, 2 years, \$2,000 • **Judson Brewer**, GoBlue Labs, *EEG Lead Reduction Project*, 1 year, \$120,606 • **Jessica Cardin**, Richard & Susan Smith Family Foundation, *GABAergic Contributions to Neural and Cognitive Deficits in a Genetic Model of Schizophrenia*, 3 years, \$300,000 • **Michael Choma**, March of Dimes, *Ciliary Defects as Modifiers of Respiratory Disease Severity in Premature Infants*, 2 years, \$150,000 • **Sierra Colavito**, American Cancer Society, Inc., *Crosstalk Between the NF Kappa B and Hedgehog Pathways in Breast Cancer*, 2 years, \$102,000 • **Eve Colson**, Council on Medical Student Education in Pediatrics, *Medical, Nursing, and Physician Assistant Perspectives about Interprofessional Education (IPE)*, 2 years, \$5,000 • **Chris Cotsapas**, Mayo Clinic College of Medicine (NIH), *Determining the Genetic Basis of Vaccine Response in Humans*, 1.1 years, \$523,763; Benaroya Research Institute, *Discovering Autoimmune Disease Mechanisms by Integrating Genetics and Epigenetics*, 1 year, \$249,951 **Paul Desan**, Haiden Educational District, Ministry of Education, Peoples Republic of China, *Resilience Skills and Depression Prevention; An Educational Intervention for High School Students*, 1 year, \$13,750 • **Ralph DiLeone**, Foundation for Prader-Willi Research, *The Role of the Prefrontal Cortex in Prader-Willi Syndrome Hyperphagia*, 1 year, \$69,450 • **Anne Eichmann**, Genentech Inc., *Lymphatic Circulation in Health and Disease*, 1 day, \$3,000; Merck Sharp & Dohme, *Lymphatic Circulation in Health and Disease*, 1 day, \$7,500 • **Leah Ferrucci**, American Cancer Society, Inc., *Understanding and Preventing Indoor Tanning Among Adolescents and Young Adults*, 5 years, \$729,000 • **Richard Flavell**, 5 years, \$3,011,500; **Ruslan Medzhitov**, 5 years, \$6,988,500; Blavatnik Family Foundation, *Inflammation, Homeostasis, and Chronic Disease (Blavatnik Family Foundation)* • **Richard Flavell**, **Akiko Iwasaki**, **Jordan Pober**, AbbVie, Inc., *AbbVie Administrative Core*, 5 years, \$2,485,689 • **Luciana Frick**, Tourette Syndrome Association, Inc., *Histamine Regulation of Brain-Immune Interactions in an Animal Model of Tourette Syndrome*, 1 year, \$40,000 • **Patrick Gallagher**, **Vincent Schulz**, Duke (Doris) Charitable Foundation, *Genomic and Functional Analyses of Erythrocyte Hydration Pathways as Modifiers in Sickle Cell Disease*, 3 years, \$486,000 • **Guadalupe Garcia-Tsao**, University of North Carolina at Chapel Hill (NIH), *Integrated Approaches for Identifying Molecular Targets in Alcoholic Hepatitis (InTeam)*, 1 year, \$27,000; McGuire Research Institute, Inc., *Infections and Other Complications of Cirrhosis: A Prospective Multi-center Study*, 2 years, \$3,500 • **John Geibel**, New Haven Pharmaceuticals, *Regulation of Gastric pH by Selected Zn Salts*, 1.1 years, \$53,050 • **Mark Gerstein**, Wellcome Trust Sangar Institute (NIH), *GENCODE: Comprehensive Gene Annotation for Human and Mouse*, 1.5 years, \$221,998 • **David Glahn**, Texas Biomedical Research Institute (Formerly Southwest Foundation for Biomedical Research) (NIH), *Whole Genome Sequencing to Identify Causal Genetic Variants Influencing CVD Risk*, 1 year, \$53,501 • **Daniel Goldstein**, International Society for Heart and Lung Transplantation, *ISHLT Travel Award*, 3 months, \$6,000 **Daniel Greif**, March of Dimes, *Excessive and Ectopic Vascular Smooth Muscle Cells in Pulmonary Hypertension: From Where Do They Come and How Do They Get Here?* 2 years, \$150,000 **Abhijeet Gummadavelli**, Howard Hughes

Medical Institute, *Neurostimulation to Prevent Impaired Consciousness in Epilepsy*, 1 year, \$40,000 • **Keith Hawkins**, Hartford Hospital, *Midlife Vascular Risk Factors for Cognitive Impairment, Cerebrovascular Disease and Dementia*, 5 years, \$55,461 • **Kevan Herold**, Duke University (NIH), *Mechanisms of B Cell Responses in Autoimmune Disease: S13-SRAO1-YAL*, 1 year, \$38,293 • **Erica Herzog**, University of Pittsburgh (NIH), *Sarcoidosis and A1AT Genomics and Informatics Center*, 1 year, \$202,510 • **Michael Higley**, March of Dimes, *Functional Role of GABAergic Signaling in the Developing Neocortex*, 2.3 years, \$150,000 • **Michael Hodsdon, David Peaper**, MZ Diagnostics, Inc. (NIH), *The Use of Mass Spectrometry for the Rapid Detection of Carbapenemase-Producing Bacteria*, 6 months, \$49,999 • **Erin Hofstatter**, University of Michigan (NIH), *A Randomized Phase III Trial of Adjuvant Therapy Comparing Chemotherapy Alone (Six Cycles of Docetaxel Plus Cyclophosphamide or Four Cycles of Doxorubicin Plus Cyclophosphamide Followed by Weekly Paclitaxel) to Chemotherapy Plus Trastuzumab With Versus Without Trastuzumab in Women With Node-Positive or High-Risk Node-Negative HER2-Low Invasive Breast*, 1.1 years, \$8,250 • **Leora Horwitz**, Robert Leet and Clara Guthrie Patterson Trust, *Evaluation of a Multi-Faceted Readmission Reduction Program*, 1 year, \$75,000 • **Janice Hwang**, Endocrine Fellows Foundation, *Investigating Markers of Energy Metabolism in the CNS and Periphery in Pregnant Women with Varying Degrees of Insulin Resistance*, 1 year, \$7,500 • **Melinda Irwin**, Livestrong, *Effect of the LIVESTRONG at the YMCA Exercise Program on Cancer Related Outcomes in Cancer Survivors*, 2 years, \$167,500 • **Akiko Iwasaki**, Agenus, Inc., *Pilot Study for Examining Prime and Pull with the HerpV+QS-21 Vaccine*, 1 year, \$60,057; University of Minnesota (NIH), *Pilot Project to Find Optimal Timing for Prime and Pull to Recruit Plasma Cells*, 1.6 years, \$81,001 • **Ryan Jensen**, Breast Cancer Alliance, Inc., *Biochemical and Genetic Characterization of BRCA2 Sequence Variants*, 2 years, \$125,000 • **Elizabeth Jonas**, FRAXA Research Foundation, *Bcl-xL Inhibition as a Therapeutic Strategy for Fragile X Syndrome*, 1 year, \$45,000 • **Amy Justice**, University of Washington, Seattle (NIH), *Benefits and Harms of Lung Cancer Screening in HIV Infection*, 1 year, \$62,758 • **Jennifer Kapo**, Milbank Foundation for Rehabilitation, *Milbank Foundation Palliative Care Support*, 4 years, \$1,000,000 • **Gerald Kayingo**, Physician Assistant Education Association, *The Impact of Patient-Centered Medical Homes on Primary Care Clerkship Experiences: Are PA Students Exposed to Patient-Centered Medical Homes More Satisfied with their Clerkship Experience and are They More Likely to Consider a Career in Primary Care?* 1.4 years, \$7,000 • **Mustafa Khokha**, New England Research Institutes (NIH), *Identifying a Cilia Role for CHD Candidate Genes*, 1 year, \$149,474 • **Young-Shin Kim**, University of California, San Francisco (NIH), *2/8-Collaborative Genomic Studies of Tourette Disorder*, 1.3 years, \$24,342 • **Jonathan Koff**, Gilead Sciences, *Reciprocal EGFR and Interferon Signaling Modulates Airway Epithelial Inflammation in CF*, 2 years, \$130,000; Cystic Fibrosis Foundation, *Learning and Leadership: Adult Care Quality Improvement (AQI3)*, 11 months, \$13,160 • **Archana Krishnan, Frederick Altice**, Bristol-Myers Squibb Company, *Improving Retention in Care for Released HIV-Infected Jail Detainees*, 1 year, \$30,000 • **Themis Kyriakides**, University of Colorado (NIH), *The Interplay Between Macrophages and Differentiating MSCs in Cell-Laden Hydrogels*, 1 year, \$17,348; Research Institute at Nationwide Children's Hospital, (The) (NIH), *Mechanisms of Vascular Neotissue Formation in Tissue Engineered Vascular Grafts*, 1 year, \$115,634 • **Melissa Langhan**, Thrasher Research Fund, *Detecting Post-Operative Respiratory Depression in Children: Are Our Current Standards Good Enough?* 2 years, \$207,193 • **John Leventhal**, University of Southern California

(DHHS), *A Birth Cohort Analysis of Medically Attended Infant Maltreatment Injuries*, 1 year, \$19,611 • **Richard Lifton**, New England Research Institutes (NIH), *B2B PCCG Whole Exome Sequencing Core Facility*, 1 year, \$23,580 • **Paul Lombroso**, Medical University of South Carolina (NIH), *Prevention of Cocaine-Induced Prefrontal ERK Shutoff During Early Withdrawal*, 2 years, \$31,486 • **Jason Lott**, Kaiser Foundation Research Institute (NIH), *Association between Cutaneous Melanoma and SSR1 Use: A Case-Control Study*, 1.4 years, \$10,361 • **Katie Lowther**, Lalor Foundation, *Regulation of Maternal mRNA Translation during Oogenesis by Embryonic Poly(A) Binding Protein (ePAB)*, 1 year, \$42,000 • **Xiaomei Ma**, University of Miami (NIH), *New Statistical Methods to Handle Spatial Uncertainty in Cancer Risk Estimation*, 10 months, \$212,710 • **Mark Mamula**, State of CT Dept of Public Health, *Protective and Toxic Effects of HER2 Epitope Spreading During Trastuzumab Treatment*, 2 years, \$216,042 • **Kathleen Martin**, American Heart Association (Founders Affiliate), *mTORC1 Signaling in IFN $\gamma$ -Mediated Graft Arteriosclerosis*, 3 years, \$198,000 • **Linda Mayes**, Donaghue (Patrick and Catherine Weldon) Medical Research Foundation, *Minding the Baby Home Visitation Program*, 1 year, \$55,000 • **Ruslan Medzhitov**, Else Kröner-Fresenius-Stiftung, *Disease Tolerance as a Defense Strategy*, 6 years, \$4,638,340; Genentech Inc., *Genentech-2013 Janeway Memorial Symposium*, 1 year, \$5,000 • **Wajahat Mehal**, Columbia University (NIH), *Targeting DAMPs in Alcoholic Hepatitis*, 1 year, \$135,170 • **Ruth Montgomery**, Mayo Clinic of Rochester (NIH), *Immune Signatures of Responses to Infection with Dengue Virus*, 1.7 years, \$174,604 • **Gil Mor**, Wayne State University (NIH), *Services in Support of the Perinatology Research Branch*, 1.2 years, \$210,431 • **Deepak Narayan**, Musculoskeletal Transplant Foundation, *Tissue Engineering of Breast Using Acellularized Cadaver Dermis and Pericytes*, 1.5 years, \$100,000 • **Stefania Nicoli**, Alzheimer's Association, *miR-107 Regulation of Neurovascular Permeability*, 2 years, \$100,000 • **Laura Niklason**, Foundation for Anesthesia Education & Research, *FAER Medical Anesthesia Student Fellowship*, 6 months, \$5,200; Duke University (NIH), *Endodermal Progenitor Cell Reconstitution of the Decellularized Rat Lung*, 1 year, \$23,619 • **Michael Nitabach**, John B. Pierce Laboratory Inc. (The) (NIH), *Genetically Encoded Voltage Probe Development*, 1 year, \$25,988 • **Elaine O'Keefe**, State of CT Dept of Public Health, *Quality Improvement Training for Public Health System Partners*, 1.5 years, \$81,788 • **A. Paltiel**, Stanford University (NIH), *Making Better Decisions: Policy Modeling for AIDS and Drug Abuse*, 1.8 years, \$186,901 • **John Persing**, Synthes (USA), *AO Course: Facial Reconstruction & Transplantation in Baltimore, MD*, 3 months, \$5,375; American Society of Maxillofacial Surgeons, *Whole Exome Sequencing to Reveal De Novo Mutations in Sagittal Craniostenosis*, 2 years, \$4,800; Stryker Craniomaxillofacial, *Annual Dallas Rhinoplasty Symposium*, 5 months, \$4,050; Stryker Craniomaxillofacial, *ASMS Basic Course Travel Grant*, 1.1 years, \$1,938 • **David Pitt**, National Multiple Sclerosis Society, *Iron as Biomarker for Inflammatory Activity in MS Lesions*, 3 years, \$460,665; National Multiple Sclerosis Society, *Cortical Demyelination Leads to Toxic Accumulation of Myelin Debris in Neurons*, 1 year, \$43,982 • **Christopher Pittenger**, Nancy Taylor Foundation for Chronic Diseases, Inc., *Targeted Neurofeedback: A Novel Non-Pharmacological Treatment for Obsessive-Compulsive Disorder*, 2 years, \$230,000 • **Nikolai Podoltsev**, University of Michigan (NIH), *A Randomized Phase III Study of Standard Cytarabine Plus Daunomycin (7+3) Therapy Versus Idarubicin with High Dose Cytarabine (IA) With or Without Vorinostat (IA+V) in Younger Patients with Previously Untreated Acute Myeloid Leukemia (AML)*, 1.9 years, \$2,000 • **Marc Potenza**, University of Connecticut Health Center (NIH),

*Neuroimaging of Adolescents in Treatment for Cannabis Use Disorders*, 9 months, \$4,046 • **Carrie Redlich**, Association of Occupational and Environmental Clinics, *Development of Evidence-Based Educational Material on the Health Risks of Indoor and Outdoor Air Contaminants in the Gulf Coast*, 11 months, \$25,000 • **Lynne Regan**, State of CT Dept of Public Health, *The Role of Histone Modifications in Chronic Obstructive Pulmonary Disease (COPD)*, 2 years, \$284,739 • **Joseph Ross**, Robert Leet and Clara Guthrie Patterson Trust, *Clinical Implications of the Use of Surrogate Endpoint Trials for New Drug Approvals*, 1.8 years, \$75,000 • **Carla Rothlin**, Genentech, Inc., *Genentech-2012 Yale Immunology Scientific Retreat*, 1 year, \$1,591 • **Nicola Santoro**, American Heart Association, *Gene/Nutrient Interaction in the Pathogenesis of Hepatic Steatosis*, 4 years, \$308,000 • **Alan Sartorelli**, National Foundation for Cancer Research, *Design, Syntheses and Evaluation of Prodrugs of Triapine*, 2 years, \$90,000 • **Emre Seli**, Thomas Jefferson University (NIH), *The Anti-Inflammatory mRNA-Binding Protein ZFP36 in Obesity and Metabolism*, 1 year, \$19,747 • **Neenad Sestan**, Brain & Behavior Research Foundation (formerly NARSAD), *Molecular and Cellular Mechanisms of Human Cognitive Development and Dysfunction*, 1 year, \$99,965 • **Jennifer Sherr**, Juvenile Diabetes Research Foundation International, *Effect of Liraglutide on Automated Closed-Loop Glucose Control in Type 1 Diabetes*, 2 years, \$403,912 • **Wendy Silverman**, Florida International University (NIH), *Parent Mediation of Child Anxiety CBT Outcome*, 6 months, \$32,607 • **Megan Smith**, Casey (Annie E.) Foundation, *MOMS HUB Workforce Development*, 1 year, \$266,500 • **Xiaoling Song**, Uniting Against Lung Cancer, *The Role of ERBB2 and ERBB3 in Resistance to Tyrosine Kinase Inhibitors in EGFR Mutant Lung Cancer*, 2 years, \$100,000 • **Dennis Spencer**, University of Pittsburgh Medical Center (NIH), *7T MR Spectroscopic Imaging for Human Epilepsy*, 1 year, \$19,703 • **Serena Spudich**, University of North Carolina at Chapel Hill (NIH), *HIV Tropism, Persistence, Inflammation and Neurocognition in Therapy Initiation*, 1 year, \$179,736 • **Toral Surti**, American Psychiatric Association, *MPSY APA Kempf Award*, 1.1 years, \$20,000 • **William Tamborlane**, George Washington University (The) (NIH), *The Glycemia Reduction Approaches for Diabetes: A Comparative Effectiveness Study*, 1.6 years, \$878,089 • **Andrew Tan**, Paralyzed Veterans of America, *Maladaptive Dendritic Spines*, 2 years, \$149,212 • **George Tellides**, National Marfan Foundation, *TGF- $\beta$  Signaling in Vascular Smooth Muscle Cells*, 2 years, \$100,000 • **Janis Tondora**, Center for Social Innovation (NIH), *MPSY Recovery Roadmap: A Collaborative Multimedia Tool for Person-Centered Care Planning*, 1.9 years, \$126,549 • **Merceditas Villanueva**, University of Connecticut Health Center (NIH), *ART Adherence and Secondary Prevention of HIV*, 1 year, \$101,577 • **Narendra Wajapeyee**, Uniting Against Lung Cancer, *Targeting p53 Mutant Lung Cancers*, 2 years, \$108,000 • **Tobias Walther**, G. Harold and Leila Y. Mathers Charitable Foundation, *Lipid Droplets as Cellular Organelles: The Cell Biological Basis of Energy Metabolism*, 4 years, \$1,540,000 • **Daniel Weinberger**, Pfizer Inc., U.S. Pharmaceuticals Group, *Factors Associated with the Local Persistence of Prevnar-Targeted Serotypes Among Adults*, 2 years, \$134,055 • **Sherman Weissman**, Benaroya Research Institute (NIH), *CSGADP Innovative Projects*, 1 year, \$124,067 • **Sandra Wolin**, University of Michigan (NIH), *Recruitment of Host Noncoding RNAs by HIV*, 2 years, \$209,958 • **Yong Xiong**, University of Pittsburgh (NIH), *The Mechanisms of Retrovirus Capsid Recognition by TRIM5A*, 2 years, \$105,000 • **Wendell Yarbrough**, Adenoid Cystic Carcinoma Research Foundation, *Role of TrkC in Neurotropic Salivary Cancers (Transfer)*, 1 year, \$15,750 • **Heping Zhang**, University of Colorado at Denver (NIH), *The Clinical Research/Reproductive Scientist Training Program (CREST)*, 1 year, \$97,210 • **Zhou Zhu**, Johns Hopkins University School of Medicine, *The Inflammatory Lung Disease Animal Models Core*, 1 year, \$232,347

// **Medal** (from page 1) development of novel approaches to manipulate these structures, in real time and *in vivo*, at the same sub-microscopic scale. Lin, also professor of obstetrics, gynecology, and reproductive sciences and director of the Yale Stem Cell Center (YSCC), has a longstanding relationship with the Mathers Foundation. The 2006 establishment of the YSCC was enabled in large part by the foundation's support. In supporting the YSCC, "the foundation exemplified a willingness to support a controversial research area that was being held back by federal policies," said Carolyn W. Slayman, PH.D., Sterling Professor of Genetics, professor of cellular and molecular physiology, and deputy dean for academic and scientific affairs. The new grant will support Lin's pioneering research on the molecular interactions of a complex called piRNA-Piwi, which aims to explore how epigenetic factors—proteins and other molecules that specify gene expression states inherited from generation to generation—are recruited to their target sites in the genome. The foundation has been a long-time supporter of Lyme disease research at Yale, where the tick-borne illness was first described in 1975. Another innovative investment helped establish the Yale Program for Critical Technologies in Molecular Medicine, one of the first facilities in the world to provide access to human tissues for research purposes. Additionally, foundation support has laid the groundwork for stem cell-derived therapies for Parkinson's disease, the discovery of how cells store lipids, and research by James E. Rothman, PH.D., the Fergus F. Wallace Professor of Biomedical Sciences, on how molecular messages are transmitted inside and outside cells—for which he won the 2013 Nobel Prize in Physiology or Medicine. Through its support of basic research, "the Mathers Foundation has been strategically pivotal to advances in health," said Rothman, also professor and chair of cell biology, professor of chemistry, and director of the Nanobiology Institute on Yale's West Campus. "Controlling something like atherosclerosis comes out of a century of investing in basic science." Established in 1975, the Mathers Foundation supports a broad range of research programs at a number of renowned institutions. In remarks, the foundation's president, Donald E. Handelman, emphasized its goal of supporting research with the broadest relevance to science and health. Said Handelman, "We have had a unique and productive history at Yale and have done creative and bold research projects. I'm very proud of our relationship and association with Yale." The Peter Parker Medal is named for an intrepid alumnus of the School of Medicine, Yale College, and Yale Divinity School, who traveled to China in 1834 as a medical missionary. By founding the Ophthalmic Hospital at Canton, the Reverend Peter Parker, M.D., set the stage for the extraordinarily close and wide-ranging ties between Yale and China that endure to the present day.

## Looking at RNA to get to the heart of cardiovascular disease

Yale will play a vital part in an expansive study on the role of long non-coding RNAs and microRNAs (miRNAs) in cardiovascular disease, thanks to a \$6 million grant from the Paris-based Fondation Leducq.

The five-year grant, awarded under the foundation's Transatlantic Networks of Excellence Program (TNEP), enables a transatlantic collaboration among international leaders in cardiovascular RNA biology with complementary research interests. The School of Medicine's William C. Sessa, Ph.D., the Alfred Gilman Professor of Pharmacology and professor of medicine, will lead the American "half" of the project, as U.S. coordinator.

RNA is a family of biological molecules involved in the coding, decoding, regulation, and expression of genes. Prior to the last decade, its role in cardiovascular disease had been largely unexplored.

The project's goal—to elucidate the role of non-coding and miRNAs in cardiovascular disease—further the foundation's mission of improving human health through international efforts to combat cardiovascular and neurovascular disease. Its core aims include creating a "data bank": an annotated list of the long non-coding RNAs expressed in cardiovascular tissues, to be made available as a resource for scientists in the international cardiovascular community. Another aim is to better understand how circulating miRNAs function: whether they cause disease, or are merely biomarkers—indicators, but not necessarily the cause, of conditions or processes.

Sessa's research focuses on the vascular endothelium, cells that line all blood vessels, and on the factors that can cause dysregulation of the endothelium and contribute to cardiovascular disease. His lab has been at the fore in describing the miRNA profile of vascular cells. In 2007 Sessa and colleagues published a study showing that miRNAs played a vital functional role in blood vessels. More recently, his



Carlos Fernández-Hernando (right) completed his postdoctoral training in the lab of William Sessa (left), contributing to Sessa's pioneering work on the role of microRNAs in blood vessel formation. Fernández-Hernando has since expanded on that work in his own lab at the School of Medicine, elucidating the role of microRNAs in cholesterol metabolism.

group has shed light on the connection between miRNA-29 and the gene *ELN*. *ELN* codes for a protein called tropoelastin, the precursor of the elastin that gives blood vessels their elasticity and helps them to open and close in response to the cardiac cycle.

Sessa's part in the multi-pronged project is to identify important miRNAs in endothelial cells and smooth muscle cells, which compose the bulk of vessel walls, as well as to investigate the role of miRNAs that influence either vascular remodeling in aneurysm formation or how blood vessels are made.

The project was conceived as a way to combine diverse expertise and complementary research interests. "My collaborators are all people that I admired scientifically," says Sessa, also director of the medical school's Vascular Biology and Therapeutics Program. "To be able to work with them without competing against them is refreshing."

The grant joins four European labs with three in the U.S., including two at Yale: Sessa's and that of Carlos Fernández-Hernando, Ph.D., associate professor of comparative medicine. It fosters an exchange of students and postdoctoral fellows, who will travel to partner institutions to gain experience with new research and technologies. The project's European coordinator is Thomas Thum, M.D., Ph.D., of Hannover Medical School in Germany.

The \$6 million TNEP grant is the third such grant awarded by the foundation to School of Medicine scientists.

In 2007 the foundation supported a project involving Yale's Richard P. Lifton, M.D., Ph.D., chair and Sterling Professor of Genetics and a Howard Hughes Medical Institute investigator, and the late Steven C. Hebert, M.D., then chair and C.N.H. Long Professor of Cellular and Molecular Physiology, aimed at pinpointing the kidney's role in high blood pressure. In 2010 the foundation funded research involving Michael Simons, M.D., the Robert W. Berliner Professor of Medicine and professor of cell biology, and colleagues at the Yale Cardiovascular Research Center, on the link between metabolism and arteriogenesis—the process by which new arterial blood vessels form.

Jean and Sylviane Leducq established the Fondation Leducq in 1996 to support cardiovascular disease research. One of the foundation's goals is to promote collaboration between researchers in North America and Europe. In 2004 it began to accept applications for its Transatlantic Networks of Excellence in Cardiovascular Research Program, and in 2011 the foundation opened the program to cardiovascular and neurovascular scientists worldwide. As of 2013, the foundation had awarded 39 Transatlantic Network grants, totaling more than \$240 million, to hundreds of researchers in 18 countries.

Says Sessa, "It's incredible to have non-federal sources of funding nowadays, considering the climate today for getting federal grants."

## Awards & Honors



Vineet Bhandari, M.D., associate professor of pediatrics and of obstetrics, gynecology, and reproductive sciences, is the recipient of a 2013 Hartwell Individual Biomedical

Research Award. Given by The Hartwell Foundation to support advances in children's health, the award recognizes Bhandari's research on the prevention of bronchopulmonary dysplasia, a lung condition common in babies born prematurely. Bhandari will receive \$300,000 over three years. The foundation also provides \$100,000 to support a postdoctoral fellowship at the medical school.



Vincent T. DeVita Jr., M.D., the Amy and Joseph Perella Professor of Medicine, was named a fellow of the American Association for Cancer Research Academy (AACR). The

AACR honors scientists whose research has led to significant innovation and progress against cancer. DeVita, also professor of epidemiology, was recognized for his pioneering work in oncology, including the development of curative treatments for Hodgkin's lymphoma. DeVita is currently editor-in-chief of *The Cancer Journal*.



Joan A. Steitz, Ph.D., Sterling Professor of Molecular Biophysics and Biochemistry and a Howard Hughes Medical Institute investigator, has been elected to the Royal Society, the

United Kingdom's national academy of science and the oldest scientific academy in continuous existence. The Society recognized Steitz for her pioneering work on the assembly of messenger RNAs, the molecules responsible for making proteins based on the instructions found in DNA. She is one of 10 non-British scientists elected to the Society's 2014 class.

// **Women's Health** (from page 1) from the Patrick and Catherine Weldon Donaghue Medical Research Foundation by Carolyn M. Mazure, Ph.D., the Norma Weinberg Spungen and Joan Lebson Bildner Professor in Women's Health Research and professor of psychiatry and psychology. Since then, WHRY has distributed \$4.5 million to 70 Yale investigators under its Pilot Project Program (PPP). The PPP supports Yale researchers generating feasibility data—"proof-of-concept" findings they need to win larger grants from funders like the National Institutes of Health (NIH). This "seed" money has led to \$52 million in new, external grants that allow researchers to build on their innovations. The Naratil Pioneer Award will complement and expand the reach of the PPP.

"Dr. Mazure's program is a proven incubator of ideas," Wendy Naratil says. "Tom and I are very excited about partnering with this organization to create an award that will help fund

innovative medical research that will ultimately advance women's health."

According to Mazure, also associate dean for faculty affairs, three-fourths of investigators funded through the PPP are junior and mid-level faculty "who need initial funding to launch their research." More than half of these investigators have used their pilot research to obtain larger external grants—more than five times the success rate for new investigator-initiated NIH grant applications.

As with other PPP-funded grants, the Naratil Pioneer Award recipient will be determined following an application process and review by a study section composed of Yale scientists. The award is designed to support projects that are "outside-the-box, innovative, high-risk but high-payoff," Mazure says, "or projects that are close to fruition but that [scientists] can't quite bring home without some additional help."

Projects funded by the PPP have included developing new models for treating breast cancer and preventing



Wendy and Thomas Naratil have established an award that helps scientists generate feasibility data needed to attract funding.

tumor metastasis, addiction, cardiovascular disease, depression, osteoporosis, and adaptation of returning women combat veterans.

"The establishment of these permanent funds signals that women's health research is here to stay, and the impact of our research will be even greater. I am deeply grateful," Mazure says.

// **Translational Research** (from page 3) cancer research and genomics; these cores require the investment of millions of dollars to purchase, maintain, and repair sophisticated instrumentation.

YCCI has also worked with YCC and Yale-New Haven Hospital on an ambitious informatics program to support research that includes the implementation of both an electronic medical record and a clinical research management system across the entire Yale New Haven Health System, allowing researchers access to clinical data and improving the efficiency and quality of research studies. The integration of the two systems has helped improve planning for clinical studies, enabled easier access to potential patient populations and disease registries, and improved the research experience for study participants.

"In an era of shrinking NIH budgets it's important to efficiently utilize limited resources," says Sherwin. "There's no doubt that our philosophy of partnership has served us well."