Yale Cancer Center benefits doubly from generosity

United Technologies supports ‘the power of innovation’ in Yale’s cancer care and research

United Technologies Corporation (UTC), a Hartford-based multinational manufacturer and Connecticut’s largest private employer, has donated $5 million to establish a new endowed professorship at Yale Cancer Center (YCC). The gift, which establishes the United Technologies Corporation Professorship in Cancer Research, stems from UTC’s long-time commitment to supporting cancer care and research, and represents a deepened commitment by UTC to what its leaders see as a track record of success at Yale. In July 2008, UTC announced a $1 million gift to Smilow Cancer Hospital at Yale-New Haven, which was then under construction and opened in 2009.

"Smilow Cancer Hospital is now delivering great service to the community, including UTC employees," says Louis Chênevert, chairman and CEO of United Technologies. "Our company has a long history of supporting leading organizations in our communities, and Yale Cancer Center is a proven leader.”

The new professorship, which will support the full-time research activities of a faculty member whose primary research focus is cancer, is also part of what Chênevert describes as UTC’s “broader efforts of promoting employee wellness.”

Mark Reitsma, UTC’s manager of Global Human Resources Support Operations, is one of many United Technologies employees who have been treated for cancer at Smilow. Diagnosed with stage 4 lung cancer in 2010, Reitsma was initially told that he had only a few months or years to live. And then, at his supervisor’s recommendation, he sought a second opinion at Smilow.

Under the care of Scott N. Gettinger, M.D., associate professor of medicine, Reitsma’s treatment has included chemotherapy and new Phase I clinical trial drugs. Not only has his disease been stable, but on a national scale, the passage and implementation of the Affordable Care Act represents a sea change for American medicine—particularly for academic medical centers such as Yale’s—and the nation’s serious shortage of primary care physicians presents an ongoing challenge.

“We know Obamacare is going to be here. We have to go with a very strong primary care base,” says Taheri. “And if we are data-driven, thoughtful, and methodical, we can manage the changes and balance all the missions of the enterprise, and come out more able to bear risk.”

Taheri has been charged with establishing a strong management structure for YMG and maintaining its high-performing clinical operation.

New CEO will lead medical school’s clinical practice

Executive arrives at a time of major growth in Yale’s practice, and change in American medicine as a whole

Paul Taheri, M.D., M.B.A., has joined the School of Medicine as deputy dean and chief executive officer of Yale Medical Group (YMG), following a nationwide search. Taheri began his new role at Yale in early March.

Taheri was the senior associate dean for clinical affairs and president and CEO of the University of Vermont (UVM) Medical Group in Burlington as well as a professor of surgery at UVM. There, he was responsible for overseeing and managing a 500-member multispecialty practice with more than 1,000 staff and $290 million in annual revenue. Taheri has been credited with preparing the group, both financially and operationally, for the future of health care reform.

He comes to Yale at a pivotal time for the school’s clinical practice, which has expanded remarkably over the past decade. The size of the clinical faculty has grown dramatically, clinical revenues have nearly doubled, and there has been a significant expansion in the breadth and depth of clinical programs. With these developments has come the need for a more centralized and unified physician group practice.

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This month, Paul Taheri joins the School of Medicine as CEO of Yale Medical Group. Among other goals, Taheri aims to standardize the operations of the clinical practice across its many sites, fully integrate electronic medical records, and oversee an expansion of Yale’s role in addressing the nation’s continuing shortage of primary care providers.
Getting to the heart of disease

Scientist works toward molecular therapies for cardiovascular diseases

Born in Leningrad (now St. Petersburg), Russia, to Jewish parents before the fall of the Soviet Union, Michael Simons, m.d., says a medical career was “sort of a default.” Anti-Semitism barred Jews from many scientific pursuits, so his parents, both doctors, encouraged his interest in medicine as the basis for a strong natural science education.

Simons’ family immigrated to Boston in 1978. Simons had begun a 6-year medical program immediately after high school in Russia, so he was admitted to Boston University School of Medicine as a third-year student, but he chose instead to start anew, as an undergraduate. “I thought, if I continue in a medical program, I’ll forever have an inadequate undergraduate education,” he says, speaking with a mild accent and an understated intensity.

Knowing nothing about the nearby Massachusetts Institute of Technology (MIT), Simons walked inside and introduced himself. “I figured it’s probably a state school, so it can’t be too expensive,” he says, laughing. He applied and was offered a spot and a scholarship.

After graduating, Simons went to medical school at Yale, where he began to explore cardiology, crossing paths with influential figures in the field such as Barry L. Zaret, m.d., now professor emeritus of medicine, and S. Evans Downing, m.d., professor emeritus of pathology, an adviser for his thesis research in coronary physiology.

In 1993 Simons joined the faculty at Harvard Medical School and Boston’s Beth Israel Hospital (now Beth Israel Deaconess Medical Center), whose chief of cardiology was William Grossman, m.d., whose success in recruiting leading molecular cardiologists soon transformed the program into one of the world’s best. “I never knew if it happened by design or by accident, but we were able to do what nobody else could do,” Simons says.

By that time, physicians were routinely using procedures like balloon angioplasty and stenting to treat coronary artery disease, but Simons was interested in doing so by stimulating the growth of new arteries, a process known as arteriogenesis. To that end, he began studying whether recently discovered angiogenic growth factors might be used to accomplish that goal.

Animal research had shown promise, but studies in humans were inconclusive. To better understand arteriogenesis, Simons studied the molecular controls that determine blood vessel growth. He continued this research for seven years as the A.G. Huer Professor of Medicine at Dartmouth Medical School, uncovering new and unexpected mechanisms controlling how the signals of growth factors are processed in their target cells.

Returning to Yale in 2008, Simons succeeded Zaret as the Robert W. Berliner Professor of Medicine and chief of the medical school’s Section of Cardiovascular Medicine, and he launched the Yale Cardiovascular Research Center, which has become a research powerhouse under his direction.

Simons’ work holds great promise beyond the treatment of coronary disease. “There are distinct signals that control cell fate and thus the type of vasculature that’s formed,” says Simons, also professor of cell biology. By manipulating these signals, his work suggests, the growth of arteries, veins, and lymphatic vessels can be stimulated in a targeted way to treat arterial, venous, and lymphatic diseases—and he also believes that manipulating the vessels that supply blood to tumors may one day lead to new possibilities for treating cancer.

Women’s Health Research at Yale celebrates 15 years of success

Women’s Health Research at Yale (WHRY), whose mission is to ensure that women are included in research studies, gender differences in health are examined, and health outcomes are analyzed by gender, celebrated its 15th anniversary in February.

Since its inception, WHRY has awarded more than $4.4 million in “seed” grants to more than 60 Yale investigators. Many of these scientists used the results from WHRY-funded studies to obtain a total of nearly $50 million in grants that further their work in key areas of research. Some of these areas include developing new models for treating breast cancer and preventing tumor metastasis; smoking and other addictive behaviors; cardiovascular disease; depression; osteoporosis; and adaptation of returning women combat veterans.

WHRY’s mission also includes building interdisciplinary research cores, training the next generation of researchers, and engaging the community through outreach.

“Three-fourths of the pilot investigators obtained external funding using their pilot results, at least five times the success rate for new investigator-initiated National Institutes of Health grant applications,” says Carolyn M. Mazure, Ph.D., director of WHRY, professor of psychiatry and psychology, and associate dean for faculty affairs. “More than half of the funded investigators obtained external funding using their pilot results, at least five times the success rate for new investigator-initiated National Institutes of Health grant applications.”

WHRY was founded in 1998 with funding from the Patrick and Catherine Weldon Donoghue Medical Research Foundation.

Medical student is ahead of the curve, and still under 30

Nicholas Downing, a student in the School of Medicine’s Class of 2014, has been named one of Forbes magazine’s 30 most influential people under the age of 30. In 2011, as a first-year student, Downing began comparing the speed with which the U.S. Food and Drug Administration (FDA) approves new drugs to the speeds of drug approval by comparable agencies in Europe and Canada.

His work, funded by the Pew Foundation and published in 2012 in The New England Journal of Medicine (Downing is one of the youngest-ever first authors published in the prestigious journal) showed that, contrary to popular belief, the FDA was faster than regulators in other countries at approving new medicines.

The idea for the FDA study emerged from the impending reauthorization of the Prescription Drug User Fee Act (PDUFA), which was first enacted in 1992 to allow the FDA to collect fees from drug companies to fund the process of new drug approval. Downing says that his study “injected some objective information into what had become a relatively subjective debate.”
Proteins folding badly: havoc ensues

When exposed to the antibiotic streptomycin, bacterial cells begin making mistakes in protein production. The error-ridden proteins fold improperly and accumulate in the cell, clumping into toxic aggregates that eventually kill the bacteria. Such aggregates are of broad interest because they are also a hallmark of neurodegenerative conditions such as Alzheimer’s disease. A research group led by Dieter Stöll, PhD, professor of Molecular Biophysics and Biochemistry and professor of chemistry, Jesse Rinehart, PhD, assistant professor of cellular and molecular physiology, and Jajang Ling, PhD, postdoctoral associate, have found that proteins misfolded due to streptomycin are unusually prone to oxidation, a chemical state more likely to damage the bacterial cell. When the group amplified the expression of certain genes related to oxidation and reduction, streptomycin-induced damage fell far less.

The results, published in the December 14, 2012 issue of Molecular Cell, could shed light on protein aggregates related to human disease.

How bad timing befalls the brain

In patients with Parkinson’s disease (PD), carefully timed actions, such as the coordinated behaviors that make up body movements, can be severely disrupted. The brain’s prefrontal cortex, which is involved in planning behavior, receives input from the ventral tegmental area (VTA), a cluster of neurons in the midbrain that produce the neurotransmitter dopamine. Since dopamine neurons are damaged in PD, a team of Yale scientists wanted to know whether VTA neurons could play a role in temporal dysfunction.

Ralph J. DiLeone, PhD, associate professor of psychiatry and neurobiology, and colleagues trained mice to press their noses against a wall for food rewards, which would only be given if at least 20 seconds had elapsed since the last reward. Over time, the mice learned to wait 20 seconds before touching the wall. As reported in the December 11, 2012 issue of Proceedings of the National Academy of Sciences, when the team precisely targeted dopamine receptors in prefrontal neurons to alter their activity, the mice were much less accurate in timing the reward. They repeatedly tried to get a reward after only 10 or 15 seconds. The findings could provide a new target for drugs to help PD patients who have difficulty timing their behaviors.

Positron emission tomography is a vital tool for School of Medicine researchers studying psychiatric diseases, diabetes, and cancer

Imagine trying to develop a drug and being able to see how and where that drug acts inside the body of a living person. Just such a tool is provided by positron emission tomography (PET), an imaging technology that is aiding drug development and research on the mechanisms of disease at the School of Medicine’s state-of-the-art PET Center. Animal models are useful for many aspects of biological research, but when the aim is translating research discoveries into applicable treatments for humans, particularly for brain disorders, research in living humans is critical. “It’s only through imaging that you can begin to understand the complexity of the human brain,” says Robert S. Sherwin, MD, the John L. Long Professor of Medicine and director of the Yale Center for Clinical Investigation (VCCI).

It is precisely the inaccessibility of the human brain that makes in vivo imaging technologies like PET so valuable. “If you suffer from an illness of nearly any organ of your body, it’s perfectly acceptable to donate a piece of that organ for research,” via biopsy, says John H. Krystal, MD, Robert L. McNeil Jr. Professor of Translational Research and chair of the Department of Psychiatry. “But the preciousness of brain tissue has prohibited psychiatry from developing the kind of understanding of the organ that it studies relative to what is possible in other areas of medicine.”

In addition to the critical role it has played in neuroscience research at Yale, PET is now beginning to see wide use in research on diseases such as cancer and diabetes.

Led by Richard E. Carson, PhD, professor of diagnostic radiology and biomedical engineering, the PET Center’s mission—to provide the highest quality of nuclear imaging to the medical school’s researchers—is embodied in numerous collaborations both on campus and off, all relying on an intricate and well-choreographed network of technology and personnel.

At the heart of the 22,000-square-foot facility is a cyclotron, which accelerates atomic particles to produce short-lived radioactive isotopes. A team of radiochemists led by Yiyun Henry Huang, PhD., director of chemistry at the Center and associate professor of diagnostic radiology, uses these isotopes to synthesize radioactive versions of drug molecules or other biologically active substances. These radioactive molecules are called tracers: they trace the paths of molecules that are important in human physiology, such as glucose, and they’re administered to research subjects in extremely small, trace amounts.

A subject lies within a PET scanner (similar in appearance to a CT scanner) while radiochemists, working under great time constraints due to the short half-life of PET isotopes, create the labeled compounds. When these compounds are injected into the subject’s body they navigate and bind to specific organ sites. The PET scanner is able to detect the accumulation of radioactivity at these various sites and convert this data into color-coded maps. But PET provides more than pretty pictures: the images are based on precise quantitative biochemical and pharmacological information that can be useful in its own right.

In psychiatry, imaging technologies like PET have enabled some of the most critical discoveries in recent decades. Since the early 1960s, psychiatrists had hypothesized, for instance, that psychosis—a set of symptoms seen in schizophrenia that includes hallucinations and delusions—was a consequence of hyperactivity of the brain’s dopamine signaling system. “But until recently, we had no way to test that hypothesis,” Krystal says. This changed in the 1990s, when new research approaches in imaging made it possible to measure dopamine release noninvasively in a living person. “Now that we have PET,” Krystal says, “we’ve identified a number of pathological mechanisms that might be targeted with treatments for psychiatric disorders.”

In the quest to find such treatments, brain imaging has become essential. Single-photon emission computed tomography, or SPECT, is a complementary imaging tool (often used during cardiac stress tests) that is more widely available than PET and does not require a cyclotron, because SPECT tracers, often based on iodine or technetium, are longer-lived and can be ordered from suppliers. But PET has become more popular thanks to the development of the PET isotope Fluorine-18, which has a longer half-life than most PET tracers and is widely used in clinical // PET Center (page 7)

Scanning the horizon

There is no shortage of great ideas at Yale School of Medicine, as evidenced by the story on this page describing the number and variety of investigators using positron emission tomography (PET) to study psychiatric diseases, diabetes, and cancer. The strengths of Yale’s basic science, translational, and clinical research continues to provide extraordinary opportunities to pioneer many promising and crucial medical discoveries. We have invested strategically in technology and core equipment that assists many researchers in their work, making the School of Medicine one of the largest and most productive biomedical research institutions in the world. Medical school faculty are active in hundreds of fields, working to discover basic biological mechanisms, understand disease processes, develop new diagnostic and therapeutic strategies, and analyze disease incidence and treatment outcomes across populations. Our research enterprise is robust and highly collaborative and it is among the top five recipients of funding from the National Institutes of Health.

The generosity of individual donors can accelerate Yale’s groundbreaking research. With independent funds, Yale researchers are able to harness the power of cutting-edge technology—like PET imaging—and pursue tomorrow’s most significant biomedical discoveries. There are many ways you can participate:

Create a research fund to support new initiatives $50,000
Endow a Yale Scholar fund to support a young investigator $1.5 million
(Eligible for 100% matching funds from Yale University)
Fund a professorship to assist a distinguished researcher $5 million

For information about these and other ways to support the School of Medicine, contact Jancy Houck, associate vice president for development and director, medical development, at (203) 436-8560 or jancy.houck@yale.edu
OUT & ABOUT

September 23 School of Medicine students and faculty took their talents to the courts at the Faculty-Student Tennis Classic. 1. (From left) Medical students Anton Safonov ’15, Joel Winer ’15, Jia Liu ’15, and Michael Chang ’15. 2. Alex Scherer ’18 3. Robert Udelsman, M.D., M.B.A., chair and William H. Carmalt Professor of Surgery and surgeon-in-chief at Yale-New Haven Hospital, attends the baseline. 4. Jennifer A. Galvin, M.D., assistant professor of ophthalmology and visual science and pediatrics, keeps her eye on the ball. 5. Jordan Gruskay ’19, gives it his all.

October 18 A reception was held in the medical school’s Historical Library honoring the appointment of George Lister, M.D., as chair of the Department of Pediatrics. Lister, seen here with a patient, Jonathan Narducci, is a 1973 graduate of the School of Medicine and former member of its pediatrics faculty. Lister is Jean McLean Wallace Professor of Pediatrics, professor of cellular and molecular physiology, and physician-in-chief at Yale-New Haven Children’s Hospital.

November 6 A celebration of the election of Marina Picciotto, Ph.D., Charles B.G. Murphy Professor of Psychiatry and professor of neurobiology and pharmacology, to the Institute of Medicine was held in the medical school’s Historical Library. 1. Members of Picciotto’s lab (from left) include: Mary Burke, Seth Taylor, Cali Calarco, Emily Einstein, Ph.D., Picciotto, Margreet Plantenga, Yann S. Mineur, Ph.D., Yon Woo Jung, Samantha M. Sheppard, and Sam R.S. Blakeman. 2. (From left) John H. Krystal, M.D., chair of the Department of Psychiatry and Robert L. MacNeil Jr. Professor of Translational Research; Picciotto, Robert J. Alpern, M.D., dean and Ensign Professor of Medicine, and Pietro De Camilli, M.D., Eugene Higgins Professor of Cell Biology and professor of neurobiology. 3. Picciotto and her husband, Angus C. Nain, Ph.D., Charles B.G. Murphy Professor of Psychiatry and professor of pharmacology.

November 7 The Jane Coffin Childs Memorial Fund for Medical Research held a Symposium in honor of its 75th anniversary. 1. Huda Y. Zhogbi, M.D., of Baylor College of Medicine. 2. Members of the board include (front, from left) Stephen J. Elledge, Ph.D., of Harvard Medical School, Randy W. Schekman, Ph.D., of the University of California–Berkeley, Cynthia J. Kenyon, Ph.D., of the University of California–San Francisco; and (back, from left) Haifan Lin, Ph.D., professor of cell biology and genetics at the School of Medicine and director of the Yale Stem Cell Center; Richard M. Lesick, Ph.D., of Harvard University; Zhogbi; John Kuriyan, Ph.D., of the University of California–Berkeley; and Thomas D. Pollard, Ph.D., Sterling Professor of Molecular, Cellular and Developmental Biology, professor of molecular biophysics and biochemistry, and dean of the Yale Graduate School of Arts and Sciences. 3. (From left) Bronwen A. Childs, member of the Fund; and James L. Childs, Sc.D., senior research scientist and lecturer in epidemiology at the School of Public Health and chairman of the Fund’s board of managers.

November 9 1. The Donaghue Foundation’s annual Andrews Lecture was given by Sue Sheridan, M.B.A., deputy director of patient engagement at the Washington, D.C.-based Patient-Centered Outcomes Research Institute. 2. Mark R. Mercurio, M.D., M.A., professor of pediatrics and director of the School of Medicine’s Program for Biomedical Ethics (left), and Moreen Donahue, D.N.P., R.N., senior vice president, patient care services, and chief nursing officer, Western Connecticut Health Network, take questions. 3. Raymond S. Andrews Jr., a trustee of foundation from 1993 to 2007 for whom the lectureship is named, enjoys a light moment.

November 15 Yale students in the health professions came together to organize the 20th Annual Hunger & Homelessness Auction. This year, more than $37,000 was raised for charities and service agencies in the New Haven area. 1. (From left) Linh Vu ’16, Richard Kim ’16, and Lucas Butler ’16, make a bid. 2. Amanda King ’15, one of the auction’s co-organizers. 3. James J. Abrahams, M.D., professor of diagnostic radiology and surgery, with a friend. 4. Students in the Physician Associate program with (in bow tie) William B. Stewart, Ph.D., associate professor of surgery.
The cells that make up each human body are discovered to be surprisingly different from one another at the level of the genome

Although the many cells in a human body have distinct functions and appearances, it’s generally been assumed that they all share the same genetic blueprint. So when adult cells are reprogrammed into their most basic, stem cell state, it’s assumed that the resulting stem cells will all be the same. Such induced pluripotent stem cells (iPSCs), the thinking goes, could then be coaxed to develop into any of a number of different cell types that genetically match a donor. But a new discovery by a team of Yale researchers has upended this reasoning: cells accumulate so many genetic changes during a human’s lifetime, they’ve found, that even a single tissue can give rise to genetically diverse iPSCs.

“These cells are increasingly used as models for disease and potentially can be used as the basis for treatments,” says Flora M. Vaccarino, M.D., Harris Professor in the Child Study Center and professor of neurobiology, who led the new study. “But there was evidence based on other experiments that there was genetic variation among populations of iPSCs, which could be bad news for the field.”

The variation had been spotted when other researchers compared the genomes of iPSCs that they expected to be identical, since they’d all been reprogrammed from the same tissue in a single individual. Instead, when the iPSC genomes were compared to one another, huge chunks of DNA were found to be duplicated or deleted—a phenomenon called copy-number variation (CNV). Scientists began to fear that reprogramming creates unstable genomes and an increased ability to develop mutations, which would undermine the promise of iPSCs for both research and therapy.

But Vaccarino and her collaborators, including first author Aleksey Abyzov, Ph.D., associate research scientist, and co-senior authors Mark B. Gerstein, Ph.D., the Albert L. Williams Professor of Biomedical Informatics, and Alexander S. Laurans, M.D., assistant professor of neurosurgery, and Associate Professor of Neurosurgery Michael L. DiLuna, M.D., are aiming to set up a system that will allow a patient under a surgeon’s care to be sent down the hall to a medical spine specialist or some other caregiver. “We can send them to physical therapists whom we routinely communicate with,” says Grauer. The center also plans to recruit a physiatrist—a clinician who specializes in treating pain and helping patients regain function.

The new center, at One Long Wharf, is located in a large suite complete with X-ray machines, and the physical therapy gym has windows that overlook Long Island Sound. Clinicians meet in a hub surrounded by exam rooms, so it is simple for providers to review a diagnostic scan together or collaborate on a treatment plan.

Cusano and Kadan-Lottick were treated with surgery, but they say they found reassuring that they were able to evaluate all their options. Cusano came to Grauer with significant symptoms in her legs related to her lumbar spine. She had seen other doctors, but was still looking for a physician who would spend the time necessary to get to the root of her complex problem. “I felt like I was 100,” remembers Cusano. Grauer recommended surgical treatment known as decompression and fusion. “Although Cusano didn’t relish having an operation, she is now happy with their decision. “I’m raising. I’m snowboarding. I just lifted a

Spine Center lets patients in pain get back on track

Some Salmonella bacteria are flexible—a mouse or a monkey is as good a host as a human. But Salmonella Typhimurium (S. Typhi), which causes typhoid fever, is picky: it survives only in human cells. In the November 16, 2012 issue of Science, Jorge E. Galán, chair and Lucille P. Markey Professor of Microbial Pathogenesis, and postdoctoral fellow Stefania Spanò, Ph.D., explain why S. Typhi dies off inside non-human cells.

In many types of Salmonella, a protein called CsgG keeps a group of bacteria away from the vacuole, a membrane that surrounds the bacteria inside host cells. But S. Typhi lacks CsgG, and in non-human cells the membrane becomes studded with these enzymes, including one called Rab32. In mouse immune cells Rab32 delivers antimicrobial factors to the S. Typhi-containing vacuole, but in humans, “the immune system is still firing bullets, but this pathogen has learned how to dodge them,” Galán says. When the scientists blocked Rab32 or added the CsgG gene to S. Typhi, the bacterium successfully infected mice for the first time, results that could lead to new treatments for typhoid fever.

What’s behind a risky cellular shift

Yale scientists have pieced together a molecular program that sustains endothelial cells, which line blood vessels throughout the body. Researchers had proposed only recently that in a process called Endo-MT, these cells transition into another type, mesenchymal cells, which prompt the cells transition into another type, Endo-MT, these endothelial cells, which line blood vessels, heart valves, and other tissues. The Endo-MT shift is suspected to play a role in many conditions, including atherosclerosis and hypertension, and it wasn’t understood how the change takes place.

In the December 27, 2012 issue of Cell Reports, a team led by Michael Simon, M.D., Robert W. Bender Professor of Medicine and section chief of cardiovascular medicine, shows that a signaling molecule called fibroblast growth factor (FGF) maintains levels of let-7, a snippet of genetic material that controls a variety of other signaling molecules called microRNAs. In turn, let-7 puts the brakes on expression of the receptor for a signaling molecule called transforming growth factor beta (TGF-β). When TGF-β binds to its receptor, it directly induces Endo-MT, so when FGF blocks let-7, the signaling molecule cannot do its job, and Endo-MT is less likely.

“FGF signaling input may be the root cause of a number of the most common cardiovascular illnesses,” says Simons.

Stem cells reveal a long-hidden mosaic

Participants in a new study that used stem cells to reveal an unexpected degree of genetic mosaic in human skin cells included (standing, from left) Livia Tomasini, Anna Szekely, Mike Wilson, Sherman Weissman, Antilla Huttner, Elena Grigorenko, and Ying Zhang. (Seated, from left) Aleksey Abyzov and Flora Vaccarino, the study’s senior author.

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Spine Center lets patients in pain get back on track

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Spine Center page (5) 

// Stem cells (page 7)
Grants and contracts awarded to Yale School of Medicine
November 2011–February 2012

Federal
Herel Agaisse, nih, Mechanisms of Intrathoracic Pathogen Dissemination, 5 years, $2,078,936
Hai Blumenfeld, nih, Functional Neuroimaging in Childhood Abnormal Sleep, 5 years, $5,892,613
Roy Goodman, nih, Molecular Mechanisms of Arg Kinase Activation by Integrin B1, 4 years, $546,839, 6 months, $546,839 + Maria Diak-Wiasker, U.S. Environmental Protection Agency, Novel Behavioral Interventions for Preventing Ticking Infections in Blood Donors, 1 year, $306,296
Peter Glazer, nih, Novel Triplet-Engineered, mecLED-Mutated Cells Line for Research, 2 years, $45,077 + Mark Hochstadt, nih, Function and Assembly of Eukaryotic Proteasomes, 4 years, $1,286,017 + Ellen Hoffman, nih, A Novel Zebraﬁ sh Model for the Functional Analysis of Genes in Autism, 5 years, $72,389 + Susan Kaechele, nih, The Role of cGAS in Efector and Memory CD8 T Cells Longevity and Metabolism, 2 years, $266,224 + Maria Kamenetska, nih, Unwinding DNA, 2 years, $95,724 + Maya A. Kalyanaraman, nih, Modulation of Molecular and Cellular Mechanisms of Cardioprotection: roles of Peroxisome Proliferator-activated Receptor-Delta (PPAR-Delta), 2 years, $225,000 + Anthony Koleske, nih, The Mechanism of Arg Kinase Activation by Integrin B1, 4 years, $79,118 +米尔 Liao, nih, Characterizing Modes of Maternal Odor Signaling and Olfactory Information Processing, 1 year, $100,000 + Kevin B. Levy, nih, Prognostic and Predictive Models of Recurrence in Colon Cancer, 1 year, $81,852 + Nandakumar Narayanan, nih, Investigating the Requirement of microRNAs in the Regulation of HIF-1alpha, 2 years, $161,802

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Roy Goodman, nih, Molecular Mechanisms of Arg Kinase Activation by Integrin B1, 4 years, $546,839, 6 months, $546,839 + \\
Maria Diak-Wiasker, U.S. Environmental Protection Agency, Novel Behavioral Interventions for Preventing Ticking Infections in Blood Donors, 1 year, $306,296 & \\
Peter Glazer, nih, Novel Triplet-Engineered, mecLED-Mutated Cells Line for Research, 2 years, $45,077 + \\
Mark Hochstadt, nih, Function and Assembly of Eukaryotic Proteasomes, 4 years, $1,286,017 + \\
Ellen Hoffman, nih, A Novel Zebraﬁ sh Model for the Functional Analysis of Genes in Autism, 5 years, $72,389 + \\
Susan Kaechele, nih, The Role of cGAS in Efector and Memory CD8 T Cells Longevity and Metabolism, 2 years, $266,224 + \\
Maria Kamenetska, nih, Unwinding DNA, 2 years, $95,724 + \\
Maya A. Kalyanaraman, nih, Modulation of Molecular and Cellular Mechanisms of Cardioprotection: roles of Peroxisome Proliferator-activated Receptor-Delta (PPAR-Delta), 2 years, $225,000 + \\
Anthony Koleske, nih, The Mechanism of Arg Kinase Activation by Integrin B1, 4 years, $79,118 + \\
米尔 Liao, nih, Characterizing Modes of Maternal Odor Signaling and Olfactory Information Processing, 1 year, $100,000 + \\
Kevin B. Levy, nih, Prognostic and Predictive Models of Recurrence in Colon Cancer, 1 year, $81,852 + \\\nNandakumar Narayanan, nih, Investigating the Requirement of microRNAs in the Regulation of HIF-1alpha, 2 years, $161,802 & \\
\end{align*} \)

By IVY (from page 4) Working with department chairs, faculty, and clinical partners, he says, he plans to develop and implement strategies to increase revenue and standardize clinical operations, enhance revenues, and make the best possible use of precious available space. “There are huge beneﬁts to standardization. We could do better than we do now,” across the many sites in the Yale-New Haven Healthcare System, Talierci says. “Whether patients go to New Haven or Bridgeport, it should be the same experience.”

Talierci is past chair of the Group on Faculty Practice, co-chair of the Association of American Medical Colleges and an examiner for the American Board of Surgery. He has lectured broadly on various business topics related to medicine and has developed strategies to lower the cost of care, physician leadership, and optimizing systems. He received his undergraduate degree from St. Lawrence University and his medical degree from New York University, then completed his general surgical residency at Tulane University.

Talierci succeeds David J. Leffill, M.D., the David P. Smith Professor of Dermatology, professor of surgery, and chief of the medical school’s Section of Dermatologic Surgery and Cutaneous Medicine. Leffill, who spearheaded the branding of the clinical practice under the Yale Medical Group name, has served in successive YMG leadership positions since 1996. “Dr. Leffill is responsible for much of the transformation of Yale’s clinical practice over the past 15 years, while continuing to serve as an extraordinarily successful section chief,” says Robert J. Alpern, M.D., dean and Ensign Professor of the School of Medicine, and CEO of Yale-New Haven Health System.

Most patients don’t need surgery, so Abbed and Grauer always seek alternatives for those who can benefit from the operation. “We’re the last part of my job when I saw someone who was hurting and they weren’t candidates for surgery, so I couldn’t help them,” Abbed says. “Now we have the ability to get them the non-surgical options.”

The Spine Center’s physicians stay in close touch with physical therapists, who routinely discuss the patient’s progress with the surgeon and adjust rehabilitation techniques when necessary. “Therapy is very speciﬁc to the individual,” says Jhasson Brooks, lead physical therapist for the center. “We can bring them to a point where we reduce their pain, teach proper body mechanics and prevent further injuries,” he says.

Cusano ﬁrst saw the Spine Center’s new facility on a recent follow-up visit, and she says she loved it. But the change she sees in herself is even more impressive, she says. “Of her ﬁrst visit, she says, “I remember sitting there crying, but today there are no more tears.”

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For the second year, the Center has received generous support from the Milbank Foundation for its residential postdoctoral fellowships. The Milbank Foundation has been a long-time supporter of Yale Cancer Center and the Schools of Medicine and Public Health. Its generous gifts have enabled the Center to continue to train the next generation of physicians-scientists in the care of patients with cancer.

**The New Center for Cancer Care**

The center opened in 2007 and is managed by the Department of Medicine and the Smilow Cancer Center. The center has been designed to meet the needs of patients and their families in all phases of cancer care. It offers a comprehensive range of services, including diagnosis, treatment, and follow-up care. The center also offers support services, such as counseling and social work, to help patients and their families cope with the challenges of cancer. The center is staffed by a team of specialists, including physicians, nurses, therapists, and other professionals, who work together to provide the best possible care.

The Center is a world leader in the treatment of cancer and is recognized for its excellence in research and patient care. The Center's researchers have made significant contributions to the understanding of cancer and have developed innovative treatments that have improved the lives of patients. The Center is also home to a number of educational programs, including training programs for physicians and other health care professionals.

The Center is located on the campus of Yale University, and is part of the Yale New Haven Health System. The Center is a teaching hospital, and is affiliated with the Yale School of Medicine. The Center is supported by a combination of federal, state, and private funding, as well as donations from individuals and organizations.

The Center is committed to advancing the understanding and treatment of cancer, and to improving the lives of people with cancer and their families. The Center is dedicated to providing the highest quality care, to researching new treatments, and to training the next generation of cancer specialists.
Researchers win prize honoring exceptional immigrant scientists

On February 5, the Vilcek Foundation announced that two immune-system researchers, each of whom hold a degree from a Russian university, will share one of the 2013 Vilcek Prizes, awards that recognize significant contributions to American science and the arts made by immigrants.

Carolina E. Flavell, Ph.D., chair and Sterling Professor of Immunobiology, and Ruslan M. Medzhitov, Ph.D., David A. Wallace Professor of Immunobiology, were honored for their long-standing and influential work on the innate immune system, the first line of defense against infection by bacteria and viruses. This year’s Vilcek Prize in the arts and humanities will go to cello virtuoso Yo-Yo Ma. The prizes carry a cash award of $100,000.

Kent Professor’s research evaluates the effectiveness of treatments for addiction

Kathleen M. Carroll, Ph.D., recently named Albert E. Kent Professor of Psychiatry, studies behavioral, pharmacological, and combined treatments for addiction, with an emphasis on improving the quality of such therapies through rigorous research on their clinical efficacy.

Carroll graduated summa cum laude from Duke University, completed predoctoral training in the Yale Department of Psychiatry’s Division of Substance Abuse, and earned her Ph.D. in clinical psychology from the University of Minnesota. She joined the Yale faculty in 1990, becoming full professor in 2002. Carroll is the principal investigator of the School of Medicine’s Psychotherapy Development Research Center—the only National Institute on Drug Abuse (NIDA) center devoted to behavioral therapies research—and of the New England node of NIDA’s Clinical Trials Network. She received a MERIT Award from the National Institute of Health in 2003 for her research on computer-assisted training in cognitive-behavioral therapy. Carroll has been designated as a Highly Cited Researcher by ISI Thompson, and she is the author of more than 220 peer-reviewed research publications as well as numerous books and book chapters.

Carroll was president of the American Psychological Association’s Division 50 (Addictions) from 2002 to 2005, when she received the Division’s Distinguished Scientific Contributions to Education and Training Award.

Ensign Professor has unveiled mechanisms shared by the vascular and nervous systems

Anne Eichmann, Ph.D., newly designated Ensign Professor of Cardiology, explores the factors that determine where the cells in blood vessels and lymphatic vessels grow, as well as how the vascular and nervous systems influence each other’s growth and function. She has discovered that common molecular cues direct growth of blood vessels and nerves, opening new possibilities for directing blood vessel growth toward infarcted tissue or away from growing tumors. Eichmann is currently studying that link in diseases affecting both systems, notably diabetes.

Eichmann obtained her M.Sc. and Ph.D. in molecular and cell biology from Université Paris 13. After postdoctoral work, she moved to the Collège de France, where she was Insenm Avenir Young Investigator from 2001 to 2006 and a research director for Inserm since 2002. She joined the Yale faculty in 2010. Her research has won her numerous honors, including a Lillian Bettencourt Prize for Life Sciences, the Chevalier de l’Ordre National du Mérite, and the Jean Bernard Award from the Medical Research Foundation. She has served on the Insenm Scientific Research Council, the European Research Council, and the Foundation’s fellowship board, and the editorial boards of Physiology Reviews and Endothelium. She has been elected council member of the North American Vascular Biology Organization.

Berliner Professor studies how blood flow stimulates the formation of new arteries

Martin A. Schwartz, Ph.D., the newly named Robert Berliner Professor of Cardiology, is a noted cardiovascular researcher whose studies of cell adhesion and behavior have led to new insights into atherosclerosis and heart disease.

Professor of medicine and cell biology, Schwartz is affiliated with the Vascular Biology and Therapeutics Program. He is an expert on mechano-transduction—how cells respond to mechanical forces—and his lab’s main focus is understanding how the friction of flowing blood against the endothelial cells lining blood vessels regulates the behavior of these cells, including how increased flow leads to the growth of new arteries.

Schwartz earned his Ph.D. in physical chemistry from Stanford University. He conducted postdoctoral research at the Massachusetts Institute of Technology, and joined the faculty of Harvard Medical School in 1983. In 1991, he moved to the Scripps Research Institute, and then the University of Virginia. He joined the Yale faculty in 2011.

Schwartz is part of a team at the Yale Cardiovascular Research Center that received a five-year, $9.5 million grant from the National Heart, Lung, and Blood Institute to study the molecular basis of artery formation and develop a new framework for therapeutic advances. The professorship is named for Robert W. Berliner, M.D., a renowned kidney researcher and dean of the School of Medicine from 1973 to 1983.