



# COLUMBIA UNIVERSITY

COLLEGE OF

## PHYSICIANS &

ANNUAL REPORT

## SURGEONS 2008



# Dean's Message



Columbia University College of Physicians and Surgeons had a remarkable year by every measure. We have boosted our share of NIH grant funding, inspired governmental institutions and donors large and small to collaborate with us on an exciting array of new initiatives and programs, recruited stellar new faculty members, and had

the privilege of educating an extraordinary group of students. This annual report provides more of the details, but please let me mention some specific highlights.

We are particularly proud of the caliber of leadership we have been able to attract to our team. From Linda Fried, M.D., formerly of Johns Hopkins, who succeeded the late Allan Rosenfield as dean of the Mailman School of Public Health, to new chairs, K.S. Clifford Chao, M.D., (from M.D. Anderson Cancer Center to chair Radiation Oncology), Lawrence Stanberry, M.D., Ph.D., (University of Texas, Pediatrics), Joel Stein, M.D., (Harvard, Rehabilitation Medicine), and Sankar Ghosh, Ph.D., (Yale, Microbiology), our new leaders are international authorities in their fields. We also have added noted neurologist-author Oliver Sacks, M.D., to our neurology faculty and appointed Alfred Ashford, M.D., to be senior associate dean of our affiliation with Harlem Hospital Center. Joachim Frank, Ph.D., an accomplished scientist and Howard Hughes Medical Institute investigator, joined us after more than three decades as a senior research scientist at the Wadsworth Center in Albany. Transplant surgeon Tomoaki Kato, M.D., who joined us from the University of Miami as surgical director of liver and intestinal transplantation, is renowned for pioneering a procedure that involves the removal and partial reimplantation of six organs to resect an otherwise inoperable abdominal tumor. Sheldon Marc Feldman, M.D., who joined us from Albert Einstein College of Medicine as the new chief of the breast cancer section in the surgical oncology division, is an authority in minimally invasive breast cancer surgery and cancer prevention. These notable new faculty and many others have strengthened our programs across our wide spectrum of excellence.

Our faculty continue to garner major awards and acclaim. For example, Wafaa El-Sadr, director of the International Center for AIDS Care and Treatment Programs at the Mailman School of Public Health and professor of clinical medicine at P&S, was honored with a celebrated MacArthur Foundation "genius grant," bestowed on only 25 extraordinary individuals this year. The award recognizes Dr. El-Sadr's remarkable work in infectious disease and public health and her potential for ongoing contributions. Thomas Jessell, Ph.D., the Claire Tow Professor of Motor

Neuron Disorders in Neuroscience and Biochemistry & Molecular Biophysics, received an inaugural Kavli Prize in Neuroscience at a ceremony in Oslo, Norway. He was one of three to receive a Kavli neuroscience award and one of seven overall Kavli winners recognized for extraordinary contributions to their fields of neuroscience, nanoscience, and astrophysics.

Our stellar clinicians are widely recognized. Among *New York Magazine's* "Best Doctors" of 2008, 192 P&S faculty were listed, a 14 percent increase from the previous year. *Black Enterprise Magazine's* "Best African American Doctors" in the United States included 10 P&S faculty members, four from our affiliate, Harlem Hospital Center. Our ophthalmology chair, Stanley Chang, M.D., the Edward S. Harkness Professor of Ophthalmology and K.K. Tse and Ku Teh Ying Professor of Ophthalmology, was recognized by Castle Connolly as the winner of the 2008 National Physician of the Year Award for Clinical Excellence.

Christopher Henderson, Ph.D., co-director of our Center for Motor Neuron Biology and Disease and senior scientific adviser to New York City's privately funded Project A.L.S./Jenifer Estess Laboratory for Stem Cell Research, was recognized by the journal *Science* for coauthoring its Breakthrough of the Year for inducing the pluripotent stem cells from the skin cells of a woman with ALS to form neurons and glia.

World-class physician-scientists are drawn to Columbia as I was – and as our patients and friends are – by the unique character of P&S. We are both broadly international and intensely local. We care for patients from around the world and sponsor multicenter, international clinical trials that change the face of medical care for millions. At the same time, we are proud to be an integral part of our Washington Heights community, one of New York City's most diverse and storied neighborhoods. Our home here reminds us daily of why we chose careers and lives in medicine: to care, to discover, to educate, and to make life better for people in need.

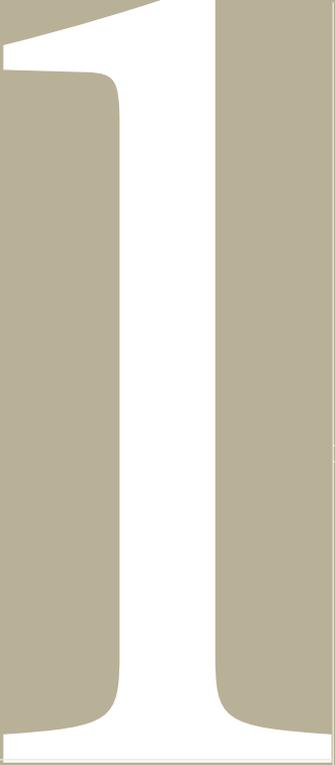
Throughout the past year, the students, faculty, staff, and leadership of P&S have demonstrated that we can thrive, grow, and continue to make good on our promise to improve the health of the people of our community, our nation, and our world. I invite you inside these pages to see why my confidence is strong and why your support of our missions is needed, deserved, and deeply appreciated.



Lee Goldman, M.D.

Initiative

and Investment



# Initiative and Investment: New Partnerships and Programs

**D**uring the past year at P&S, we have launched major new initiatives in areas ranging from stem cell research to urban health and prevention. We have recruited world leaders in several fields to

join our faculty. We continue to receive the most funding from the National Institutes of Health among all academic medical centers in the state. Our faculty continues to demonstrate an extraordinary ability to use fund-

ing effectively, as Columbia graduate program scientists in 14 research specialties – up from 10 last year – are ranked by the Chronicle of Higher Education to be among the top 10 nationally for scholarly productivity.



## Berrie Gift

One of the most extraordinary gifts we received this year was \$21 million from the Russell Berrie Foundation to enhance our world-class Naomi Berrie Diabetes Center. This new gift will fund non-reimbursed clinical care for many of the more than 12,000 patients the world-renowned center treats annually. It also supports a new professorship, new pilot research, a continuation of the Berrie Program in Cellular Therapies, including an effort to create diabetes-specific embryonic stem cells, and the Center's endowment. The only comprehensive multi-disciplinary diabetes center in New York City, the Berrie Center includes one of the largest pediatric diabetes programs, one of the largest populations of patients with adolescent-onset type 2 diabetes, and one of the largest insulin pump programs in the country.

## New Initiatives in Transplantation, Cardiovascular Research

Columbia's transplant program is a regional and national leader, with NewYork-Presbyterian Hospital ranking first in the country in the number of total solid organ transplants. Under the guidance of Jean Emond, M.D., the Thomas S. Zimmer

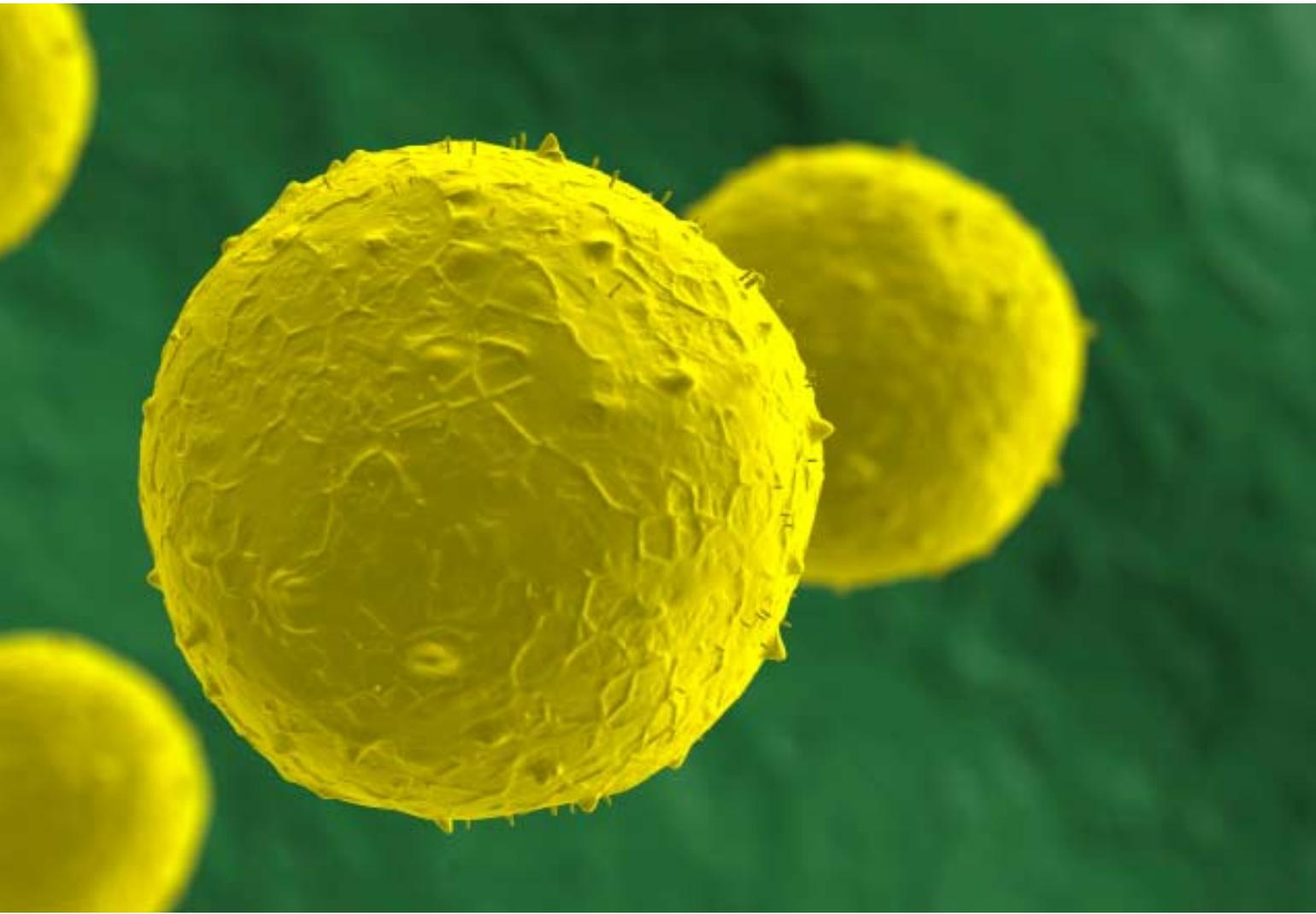
Professor of Reconstructive Surgery and a transplant pioneer who performed the first live donor liver transplant in the United States, this groundbreaking program will now expand into a full-spectrum center of excellence for transplantation, "one at the very leading edge of discovery and delivery of care," says Dr. Emond. Four departments form the core of the new transplant initiative: Medicine, Pathology, Pediatrics, and Surgery. The program will recruit additional expert transplant scientists and clinicians to better position Columbia to compete for larger NIH program project grants. Research agendas also will be expanded, including areas such as the biology of ischemia and reperfusion, alloimmune responses to donor organs, B cell contributions to graft injury, and novel immunotherapy and monitoring. In 2009, a dedicated critical care unit specifically for transplant patients is slated to open, and construction will begin on a pediatric transplant center.

A similarly comprehensive and ambitious initiative also was launched this year to foster advances in cardiovascular research. The Cardiovascular Research Initiative, directed by Alan Tall, M.D., the Tilden-Weger-Bieler Professor of Medicine and professor of physiology & cellular biophysics, will help to recruit and retain



## *Our Transplantation Legacy*

*The Columbia Transplant Initiative will position Columbia to expand research and patient care in transplantation medicine, building on our local and national leadership in solid organ transplantation.*



top faculty in the field and strengthen Columbia's capabilities in cardiovascular genetics, vascular biology, and developmental biology. The Initiative, which has 35 members representing a wide range of disciplines, aims to bring Columbia's cardiovascular program, now ranked No. 6 in the nation, to even greater prominence, integrating basic and applied research to quickly turn today's scientific discoveries into tomorrow's clinical treatments.

### **New Stem Cell Initiative Gets State Grant**

Already a national leader in adult and embryonic stem cell research, with more

than 70 faculty members pursuing different lines of investigation in the field, Columbia took a further step forward this year by creating a Stem Cell Initiative within the Department of Rehabilitation Medicine. As part of this new initiative, P&S has sought University approval to rename the department the Department of Rehabilitation and Regenerative Medicine, reflecting its expanded commitment to exploring new technologies and approaches, such as stem cells, to improve the treatment of patients with a wide variety of disabilities and disorders. The new department is chaired by Joel Stein, M.D., an international figure in

#### **STEM CELLS**

*New technologies, including the use of stem cells, have generated endless possibilities for treating disease and disability.*

#### **HEART BEATS**

***P&S is home to some of the world's leading experts in cardiovascular medicine. The new Cardiovascular Research Initiative will strengthen research programs and capabilities by developing a pipeline for new researchers and clinicians to perpetuate our legacy in heart disease scholarship, prevention, and treatment.***

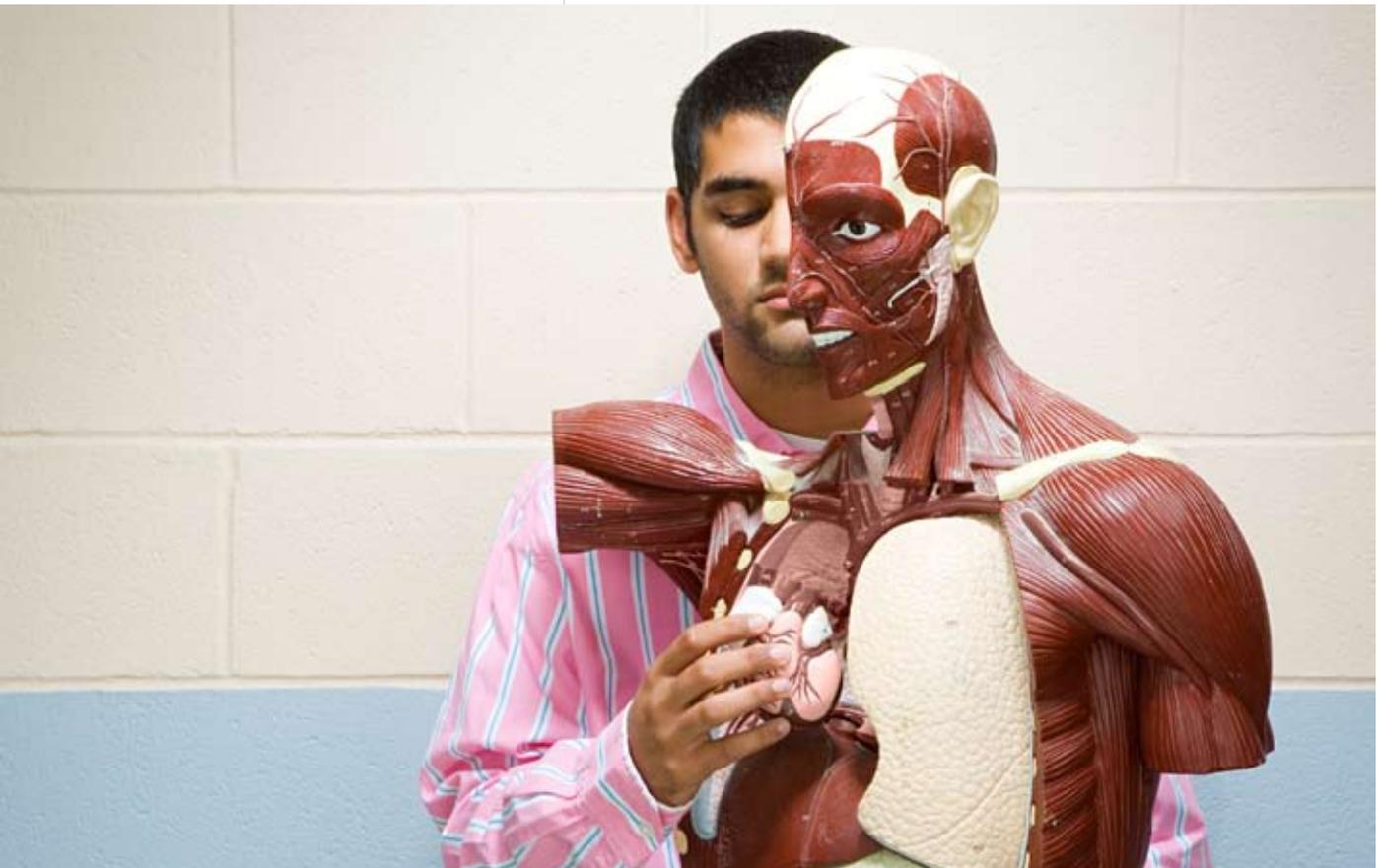
stroke research and clinical care who came to Columbia from Harvard this year, while the stem cell initiative is under the interim leadership of James Goldman, M.D., Ph.D., professor of pathology & cell biology and a long-time faculty member.

The creation of the new initiative was made possible in part by a \$2.5 million grant from the Empire State Stem Cell Board. With the funding, which was among the Empire State Stem Cell Board's first grants, Columbia is developing essential core facilities needed to work with these stem cell lines, including a neurogenesis core facility, an ultradeep sequencing core facility for the exploration of stem cells' molecular profiles, a fluorescence-activated cell sorter for purification of differentiated stem cells, and a stem cell functional imaging core

facility. Columbia and Harvard researchers recently collaborated to transform skin cells from a patient with amyotrophic lateral sclerosis into stem cells and then to motor neurons (see more about this in the research section). The Stem Cell Initiative aims to build on such successes and on a successful stem cell research symposium organized by Dr. Goldman in 2008 to place Columbia at the leading edge of this promising and evolving field.

### **Deciphering the Diabetes-Heart Disease Connection**

It has long been known that people with type 2 diabetes are dangerously susceptible to heart disease. The unanswered question remains: Why? With a \$10.8 million five-year grant from the National Institutes of Health, a multidisciplinary



team of Columbia researchers will seek to answer that question. "If we could better understand the role that insulin resistance plays in the progression of atherosclerosis, we may be able to develop therapies to prevent the serious consequences from both of these diseases," says Ira Tabas, M.D., Ph.D., professor and vice chairman of research in the Department of Medicine and the grant's principal investigator. Dr. Tabas, with Alan Tall, M.D., the Tilden-Weger-Bieler Professor of Medicine and professor of physiology & cellular biophysics, and Domenico Accili, M.D., professor of medicine and co-director of research at the Naomi Berrie Diabetes Center, will leverage their unique areas of expertise on the role of macrophage death and high atherogenic lipoprotein levels in diabetes and heart disease to identify pathways that contribute to accelerated atherosclerotic lesion progression in people with high insulin resistance.

### **Breaking Down Barriers to Chronic Care**

Many people in Columbia's Washington Heights neighborhood struggle daily to manage health conditions such as hypertension, diabetes, and dementia. A new program project grant from the National Institutes of Health will allow the Center for Health and Urban Minorities to study interventions that can help our neighbors manage their chronic health conditions. The five-year \$8 million grant supports three studies: One examines the role of community health workers in helping local residents manage their diabetes along with other life challenges. Another focuses on the role of community-based settings, such as local senior centers, in improving hypertension management. The third focuses on the role of diabetes in dementia. The studies all have a similar goal: to use community-based services to help people with chronic conditions cope with basic, primary needs that may get in the way of their health care.

### **Irving Cancer Center Recertified**

The Herbert Irving Comprehensive Cancer Center has been recertified by the National Cancer Institute as a comprehensive center, its most prestigious designation. The center, led by Riccardo Dalla-Favera, M.D., the Percy and Joanne Uris Professor of Clinical Medicine, includes more than 200 members, who have successfully attracted more than \$90 million in peer-reviewed cancer research funding.

Renowned cancer experts continue to join the outstanding faculty at the HICCC. In addition to new radiation oncology chair Clifford Chao, M.D., three other remarkable physician-scientists recently became part of our team. Carlos Cordon-Cardo, M.D., Ph.D., professor of pathology and urology, is co-leader of the genitourinary malignancy program. Also vice chair of the Department of Pathology, Dr. Cordon-Cardo has integrated molecular techniques into pathology as a way of improving assessment of a tumor's biological and clinical behavior. Edward Gelmann, M.D., the Clyde Wu Professor of Medicine, chief of the Division of Hematology/Oncology in the Department of Medicine, and deputy director for clinical research at HICCC, is expanding the medical oncology division. Owen O'Connor, M.D., Ph.D., director of the lymphoid development and malignancy program in the HICCC and chief of the lymphoma service at NYPH, is translating lab findings into therapies for lymphoma and other hematological cancers.

### **Bone Biology-Metabolism Discovery Leads to New Startup**

A groundbreaking discovery about the link between bone biology and metabolism is the catalyst for a new start-up company exploring whether this link can be translated into new treatments for

## *Foundations*

*By recruiting new faculty ... investing in current research, educational, and clinical leaders ... and building and reinforcing programs and initiatives, we strengthen our potential for continued success.*

metabolic diseases, such as type 2 diabetes and obesity.

Yet another example of Columbia's commitment to bringing innovative research quickly from bench to bedside, the new company, Escoublac, is a joint venture between P&S and its chair of genetics & development, Gerard Karsenty, M.D., Ph.D., and Cambridge-based Biogen Idec, a therapeutic development company with 15 products in phase II development and beyond.

Escoublac will focus on osteocalcin, a hormone that Dr. Karsenty's seminal research found to be involved in regulating insulin and fat storage in the body. He and his colleagues have demonstrated that an increase in osteocalcin activity prevents the development of type 2 diabetes and obesity in mice, potentially opening the door for novel therapies to treat and prevent type 2 diabetes in humans as well. Dr. Karsenty will be the chief scientific adviser at Escoublac, which will be the first occupant of Biogen's Idec Innovation Incubator (bi3), a shared-resource model designed to kick-start the translation of novel biological insights into new therapies.

### AIDS Pioneer Receives MacArthur Genius Grant

Wafaa El-Sadr, M.D., M.P.H., professor of clinical epidemiology and director of the International Center for AIDS Care and Treatment Programs at Columbia's Mailman School of Public Health, received a prestigious "genius grant" from the John D. and Catherine T. MacArthur Foundation. The \$500,000 grant, which comes with no strings attached, was awarded to only 25 extraordinary individuals this year.

Dr. El-Sadr, who is also professor of clinical medicine in P&S and chief of the Division of Infectious Diseases at Harlem Hospital Center, has redefined public health and infectious disease with in-

novative models of prevention, care, and treatment for HIV and tuberculosis. Her multi-faceted, family-focused approach to diseases whose burden falls heaviest on those with the least access to care has improved the quality of life for people right around the corner in Harlem, and halfway around the world in Africa.

### Scientist Receives Inaugural Kavli Award

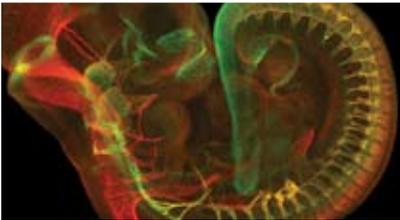
Thomas Jessell, who leads Columbia's Nobel Prize-winning team of scientists in the Mind, Brain, and Behavior Initiative, has been named among the first recipients of the Kavli Prize, designed to recognize pioneering achievements in nanoscience, neuroscience, and astrophysics. Dr. Jessell shares the million-dollar neuroscience prize with two other scientists, one from Yale and one from Karolinska Institute. He received the prize, a gold medal, and a scroll at a ceremony in Norway.

Dr. Jessell, the Claire Tow Professor of Neuroscience and of Biochemistry & Molecular Biophysics, was honored for his discoveries on the developmental and functional logic of neuronal circuits. His research has defined key cellular and molecular mechanisms that control the development and functional organization of the spinal cord.

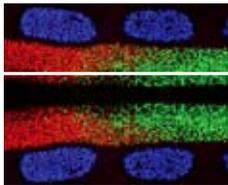
### New Faculty

With two Nobel Prize winners and a host of other internationally renowned experts in their field, P&S is already home to some of the finest minds in medicine today. This year, they have been joined by several new deans and department chairs who will help to achieve our goal of making Columbia recognized as the No. 1 academic medical center in the world.

Linda Fried, M.D., M.P.H., succeeded Allan Rosenfield as dean of the Mailman School of Public Health. Dr. Rosenfield, who died in October 2008, was ceaseless-



**PRIZED DISCOVERIES**  
Images from the lab of Thomas Jessell, Ph.D., whose research on neuronal circuits earned him an inaugural Kavli Prize





#### PRIZED TEACHING

**Ann-Judith Silverman, Ph.D., professor of pathology & cell biology, received the 2008 Charles W. Bohmfalk Award for distinguished teaching in the pre-clinical years. She has taught first-year year medical and dental students for more than 30 years.**

Alfred Ashford, M.D., professor of clinical medicine and director of medicine at the Harlem Hospital Center, has been appointed senior associate dean of the Harlem Hospital Center affiliation with P&S. He brings to the position depth and breadth of experience at Harlem, including more than 25 years as a medical oncologist there and nine years as director of the hospital's Department of Medicine.

Joachim Frank, Ph.D., a pioneer in the use of cryo-electron microscopy and three-dimensional reconstruction in the study of RNA's synthesis of protein, joined P&S as professor of biochemistry & molecular biophysics (and professor of biological sciences at Morningside). His work has dramatically enhanced our understanding of the ribosome, the workhorse driving the translation of messenger RNA into protein. The bacterial ribosome is the target of many antibiotics, and an understanding of its function will lead to better ways to fight drug resistance. Before joining P&S, Dr. Frank spent more than three decades as a senior research scientist at the Wadsworth Center in Albany. Dr. Frank is also a prestigious Howard Hughes Medical Institute investigator.

ly dedicated to the mission of the school that he helped build into one of the finest public health institutions in the world. Dr. Fried joined us from Johns Hopkins, where she directed the Johns Hopkins Center on Aging and Health, the Division of Geriatric Medicine and Gerontology, and the Program in the Epidemiology of Aging at the Bloomberg School of Public Health. With appointments in both Mailman and P&S, Dr. Fried will continue the tradition of partnership and collaboration on issues of public health, ranging from cardiovascular disease to dementia.

K.S. Clifford Chao, M.D., a pre-eminent expert in the oncologic use of image-guided targeted radiotherapy and intensity modulated radiation therapy, joined us as chair of the Department of Radiation Oncology. Before coming to Columbia, Dr. Chao, the author of the widely read textbook, "Practical Essentials of IMRT," directed image-guided therapy at the renowned M.D. Anderson Cancer Center in Houston.

Lawrence R. Stanberry, M.D., Ph.D., an authority in infectious disease, is the new chair of the Department of Pediatrics. An expert on neonatal herpes and the use of vaccines, he was a lead member of the research team that produced the first scientific evidence that a vaccine could protect humans against genital herpes, findings that provided the first proof of gender-specific vaccine protection.

Oliver Sacks, M.D., the best-selling author and renowned neurologist who has been described as "the poet laureate of medicine," has joined Columbia as professor of clinical neurology and clinical psychiatry. Dr. Sacks' recruitment exemplifies Columbia's effort to bridge the gap between neuroscience and other disciplines that study human behavior, including social sciences and the humanities. At Columbia, Dr. Sacks will pursue his longtime interest in schizophrenia, caring for patients and consulting with leading experts.

Treatments on

the Cutting Edge

2

# Treatments on the Cutting Edge: Patient Care

The thousands of patients who come to Columbia and its affiliated institutions each year seek our care because Columbia is a unique institution: a leading-edge academic medical center offering access to state-of-the-art care and a remarkable array of clinical trials available at few other institutions in the world while at the same time deeply

rooted in our own community and its urgent health care needs. Columbia's standards of care are reflected in the achievements of our clinical programs over the past year.

This year, 192 members of the P&S faculty were listed in New York magazine's list of the city's best doctors, more than any other institution and a 14 percent increase over

the previous year. Our programs in Alzheimer's disease, cardiac care, heart surgery, neurology, obstetrics and gynecology, Parkinson's disease, pediatrics, psychiatry, and stroke were rated the best in the city, while our cancer, emergency care, hip replacement, prostate cancer, and gastrointestinal disease programs were ranked second.

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## **HISTORY-MAKING UROLOGISTS**

*Of the approximately 15 women who have graduated from Columbia's urology residency program, three were among the program's first all-female class in 2008. From left: Erica Lambert, Kristin Kozakowski, and Sarah Lambert. Drs. Kozakowski and Lambert are 2003 P&S graduates.*



**CARE IN THE COMMUNITY**  
**Adefolakemi Oni'08 at the Farrell Ambulatory Care Network Center, one of New York-Presbyterian Hospital's community primary care sites.**

replacements will be done via such hybrid procedures within 10 years. The procedures are performed in a room in the catheterization laboratory that also functions as an operating room. Plans to build two more hybrid rooms are under way as Columbia specialists explore other hybrid techniques, such as combining minimally invasive valve surgery and coronary stenting. Dr. Williams is the only physician in the United States trained in both interventional cardiology and cardiac surgery.

### **New Rapid-Response Test for Kidney Failure**

When a person is having chest discomfort, standard cardiac tests can quickly diagnose indigestion vs. a heart attack. But until recently, physicians had no such test for kidney failure, and it could take days for doctors to realize that a patient's kidneys were on the verge of shutdown. Now, by testing the urine for one simple marker, a small protein called NGAL, physicians can quickly differentiate between acute kidney failure and other less dangerous conditions.

Developed by a team of experts at Columbia, led by Jonathan Barasch, M.D., Ph.D., associate professor of medicine, and Thomas Nickolas, M.D., assistant professor of clinical medicine (along with colleagues at Cincinnati Children's Hospital), the NGAL test proved much more accurate than serum creatinine levels in detecting acute failure. NGAL levels were 30 times higher in patients later diagnosed with acute kidney failure than in those without renal injury, chronic but quiescent injury, or simple volume depletion.

Such a test has been an elusive goal for renal specialists for decades, since the

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Stanley Chang, M.D., the Edward S. Harkness Professor of Ophthalmology, the K.K. Tse and Ku Teh Ying Professor of Ophthalmology, and chair of ophthalmology, received the Castle Connolly National Physician of the Year Award for Clinical Excellence, while Carolyn Britton, M.D., professor of clinical neurology, was named president of the National Medical Association. Laurence Greenhill, M.D., the Ruane Professor of Clinical Psychiatry, was named president of the American Academy of Child and Adolescent Psychiatry, while Mary D'Alton, M.D., the Willard C. Rappleye Professor of Obstetrics & Gynecology and chair of the Department of Obstetrics & Gynecology, received the Society for Maternal-Fetal Medicine Achievement Award. Together, these and thousands of other expert physicians bring the latest treatments to our patients.

### **New Cardiac Procedures Aid High-Risk Patients**

P&S physicians are developing and testing a number of new "hybrid" cardiac operations, involving both surgery and catheter procedures, that can treat a host of cardiac problems less invasively. One of these new techniques, a transcatheter aortic valve replacement, allows people who are elderly or in fragile health to receive new heart valves without undergoing open-heart surgery or going on cardiopulmonary bypass, both of which may be too risky.

The new method, which involves placing a tissue valve on a stent in a catheter that can be threaded into the femoral artery or apex of the heart, is being used on select patients in the PARTNER study, a Columbia-led multi-center trial. Mathew Williams, M.D., assistant professor of surgery, predicts that most aortic valve

damage from untreated acute kidney failure is devastating. Between 20 percent and 60 percent of patients with acute kidney injury require dialysis, and the mortality rates start at 15 percent. With about 20 percent of hospitalized patients suffering from some form of kidney injury, Dr. Nickolas says, "We need to have a better test that points us in the right direction sooner so we have a chance to save some of these patients' kidneys."

## A New York First: Stent Graft Treats Complex Aneurysm

In about 10 percent of abdominal aortic aneurysms, an affected area lies dangerously close to branching areas for the kidneys, small bowel, and liver, rendering the aneurysm impossible to treat with currently available aortic stent grafts. The only other option is major surgery, which is usually too risky in many patients, who are often over age 70 and have other medical complications.

In July 2008, in a New York area first, a 93-year-old man with this kind of aneurysm was treated with a new fenestrated endograft stent as part of an ongoing clinical trial at Columbia, the only center on the East Coast with access to this investigational device. The graft features custom-positioned holes (fenestrations) that ensure proper blood flow through the aorta and to the kidneys and nearby organs. Each device is custom manufactured from a 3-D computer model based on a spiral CT scan to suit the patient's unique anatomy. Although the procedure is more complex for the surgeon, the patient's recovery is usually smooth and allows the patient to return to normal activities within a week, according to lead surgeon James McKinsey, M.D., associate professor of clinical surgery, who performed the procedure.

## Dialysis Goes Home

Most kidney dialysis patients spend many hours a week in a dialysis center. Now, many of Columbia's patients may soon be able to receive their kidney dialysis at home, enabling more optimal timing of care, relieving overcrowding in the dialysis center, and allowing patients to receive their dialysis in more comfortable and reassuring surroundings.

Led by Dean Preddie, M.D., assistant professor of clinical medicine and director of the Columbia dialysis center's program in home hemodialysis, a four- to six-week training program has begun to educate patients in the use of next-generation, less expensive, portable, and simpler home dialysis machines. Once dialysis starts at home, periodic nurse visits ensure that the patient is comfortable and continues to have good in-home support, which Dr. Preddie says is critical to success and keeping drop-out rates low.

Since more frequent dialysis is possible in a home setting, the number of medications a patient must take to reduce high blood pressure decreases drastically, placing less stress on the heart and leaching less calcium from the bones, making it easier to manage the anemia that can result from kidney disease. Dr. Preddie predicts that this kind of care will be the wave of the future in dialysis, calling it "the next best thing to a kidney transplant for a person with kidney failure."

## New Skin Cancer Program for Transplant Patients

Skin cancer is one of the biggest threats to an organ transplant patient's long-term survival. As many as 70 percent of transplant patients will develop skin cancer at some point in their lives, due in part to the effects of the immunosuppressive drugs they take to survive. Not only do transplant patients develop melanoma at three times the rate of the general population, but the disease metastasizes more quickly and is more

deadly than in the general population. A new dermatological practice at Columbia, focused solely on organ transplant patients, aims to change those statistics. The brainchild of Heather Rogers, M.D., chief resident in the Department of Dermatology, the practice sees about 12 patients in each of its biweekly clinics. Rarely does a session go by without the diagnosis of at least one skin cancer, says Dr. Rogers.

The clinic focuses on preventing and treating skin cancers through early, direct access to dermatologists who provide education about skin cancer risk, teach effective sun protection, and catch and treat skin cancers at the earliest possible stage. The clinic also plans to offer clinical trials for novel therapies.

## Robot-Assisted Prostatectomy Improves Outcomes, Quality of Life

New findings from Ketan Badani, M.D., assistant professor of urology and director of robotic surgery, should put to rest any lingering doubts about the value of robot-assisted laparoscopic prostatectomy, now the most common type of surgery for prostate cancer. RALP, which has boomed since its approval by the FDA in 2000, is just as good as conventional surgery for cancer control, while at the same time leading to fewer complications and dramatic improvements in urinary control and sexual function. Dr. Badani reported the results, involving more than 2,700 patients, in the journal *Cancer*. Dr. Badani, who has performed more than 700 RALP procedures, was recruited to Columbia in 2007 to reinforce Columbia's national prominence as a leader in RALP surgery.

## Landmark Stem Cell Therapy Corrects Fatal Skin Disease

Nate Liao, a toddler from Clarksburg, N.J., faced years of excruciating pain, infections, malnutrition, and ultimately death from a rare genetic skin disease

**Our Clinical Mission** *Patient care, which is a cornerstone of the medical school's mission, is delivered in a variety of locations – ambulatory clinics, private doctor offices, and inpatient hospital settings – to patients from all over the world, who could choose any doctor they wish, and to the most vulnerable patients with no other place to go. Our faculty collectively are the largest medical group practice on the East Coast.*



**THROUGH THE EYES OF A CHILD**  
*The Edward S. Harkness Eye Institute's clinic for children reopened after an anonymous donor paid for renovations required after flooding in the old clinic.*

known as recessive dystrophic epidermolysis bullosa. But after undergoing a first-of-its-kind cord blood and bone marrow transplant treatment, Nate is on his way to a cure, and many other children just like him have new hope as well.

Angela M. Christiano, Ph.D., the Richard and Mildred Rhodebeck Professor of Dermatology and professor of genetics & development, paved the way for Nate's treatment, performing the first genetic studies on his family and determining the exact molecular basis for Nate's individual case of the disease. The malady results from a genetic defect leading to the absence of an essential protein, collagen type VII, which anchors the skin and lining of the gastrointestinal system to the body. The disease leaves the skin extraordinarily fragile, constantly vulnerable to wounds, tearing, scarring, and frequent infections. People live their lives continuously wrapped in mummy-like bandages, and the disease is almost always fatal.

Nate received an infusion of marrow stem cells obtained from a healthy donor, his older brother, which produce collagen type VII. The infusion corrected the underlying defect. "This is the first time physicians have approached the treatment of recessive dystrophic epidermolysis bullosa or any similar skin disease from a systemic perspective, using marrow-derived stem cells as a means to replace the missing protein throughout the body," says Dr. Christiano.

## Establishing Leadership in Lymphoma

Columbia's Herbert Irving Comprehensive Cancer Center has one of the largest portfolios of lymphoma drugs in development, with more than a dozen new therapies now in clinical trials. With the recruitment of Owen A. O'Connor, M.D., one of the world's top lymphoma researchers, as leader of our Lymphoid Development and Malignancy Program, Columbia established its commitment to finding effective treatments for this complex family of more than 40 rare and highly diverse diseases.

One of the most fatal types of lymphoma is T-cell lymphoma, a fast-growing group of non-Hodgkin's lymphomas that most commonly attack young adults. While at Memorial Sloan-Kettering Cancer Center, Dr. O'Connor helped to develop one of the most promising new therapies for T-cell lymphoma, pralatrexate. At Columbia, he is the lead investigator of an international clinical trial of the therapy for patients with aggressive T-cell lymphoma. The drug has demonstrated effectiveness in 54 percent of patients who did not respond to other treatments.

## Children's Eye Clinic Reopens

The Children's Eye Clinic at the Edward S. Harkness Eye Institute reopened in 2007, three years after it was closed by a flood. During the closure, the 2,500 young people who receive care at the clinic every year were treated in one examining room borrowed from the Institute's ITT eye clinic. Thanks to a generous gift from an anonymous donor, the renovated new facility boasts state-of-the-art ophthalmologic equipment that John T. Flynn, M.D., chief of pediatric ophthalmology and the Anne S. Cohen Professor of Pediatric Ophthalmology, calls "the best in any children's eye clinic I've worked in during my 40-year career."

## An Alternative to Hip Replacement

For decades, people with disabling osteoarthritis of the hip have had one primary option: total hip replacement. But these replacements generally last only about 20 years, and they are hard to extract and replace, so patients often are advised to wait as long as possible before undergoing the surgery. That wait can be painful and difficult for many middle-aged or younger patients.

Total hip resurfacing, a new technique offered at Columbia, is an interim solution to total hip replacement for younger people with damaged hips. William B. Macaulay, M.D., the Anne Youle Stein Professor of Clinical Orthopedic Surgery, is one of the first surgeons in the United States to perform the new procedure, which involves shaving a few centimeters of bone from the joint then covering the bone with a tough, smooth cobalt chrome. The implant used, larger than the type used in traditional hip replacement surgery, helps to stabilize the resurfaced hip and decreases the risk of postsurgical dislocation, a leading cause of hip implant failure. For as many as 10 percent to 15 percent of hip replacement candidates, hip resurfacing may offer a viable alternative that allows them to lead more active lives.

## Restoring Vision, Function for Patients with Brain Injuries

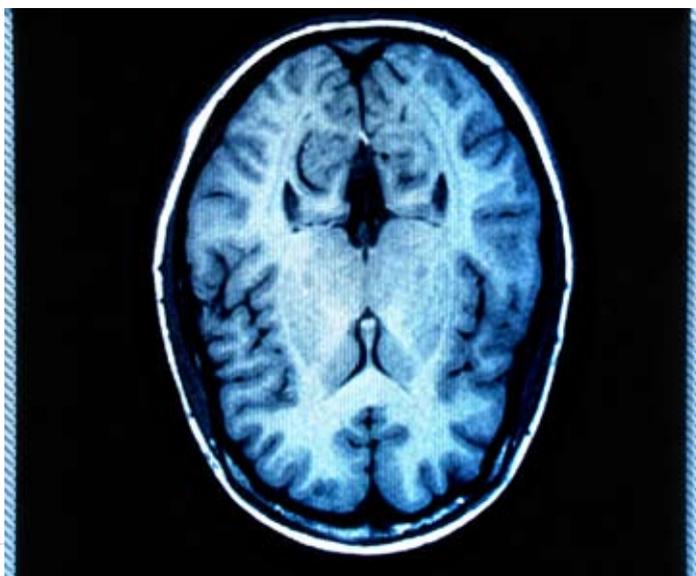
Using a new tool called Vision Restoration Therapy, specialists at Columbia have been able to improve brain activity for people who have suffered strokes or traumatic brain injuries. This rehabilitative treatment helps brain-injured patients recover lost vision, and a new study from Columbia's Division of Stroke and Critical Care demonstrates the power of the brain's response. Just one month after beginning the visual stimulation therapy, fMRI studies of six brain-injured patients showed increased activity in visual processing areas of the brain, as patients learned to detect stimuli in the border zone between the seeing and non-seeing fields.

Columbia is one of only about 50 centers nationwide to offer Vision Restoration Therapy, which creates a customized treatment for each patient based on a map of the seeing and non-seeing areas of vision. The daily therapy gradually improves vision by prompting the brain to detect light stimuli at the border between the seeing and blind areas of the visual field. "This study is encouraging because the fMRI technique allowed us to see and compare the activity levels in specific regions of the brain before and during Vision Restoration Therapy. After examining the images, the increased activity levels

demonstrate progress associated with the treatment," says Randolph S. Marshall, M.D., professor of neurology.

## Increased Use of CT Scans May Risk Radiation Exposure

The increased use of CT scans, and the radiation exposure that goes with them, may pose an unnecessary risk of cancer for many patients, say David J. Brenner, Ph.D., and Eric J. Hall, Ph.D., of Columbia's Center for Radiological Research. In the *New England Journal of Medicine*, Dr. Brenner, the Higgins Professor of Radiation Biophysics and director of the center, and Dr. Hall, the Higgins Professor Emeritus of Radiation Biophysics and former center director, pointed out that as many as one-third of the 62 million CT scans performed annually in the United States, up from 3 million in 1980, are unnecessary. Since CT scans involve far greater exposure to radiation than do conventional X-rays, the average personal radiation exposure in the country has doubled in the past 30 years. In a few decades, between 1.5 percent and 2 percent of all cancers in the United States may be due to radiation exposure from CT scans being done now, they predict. Drs. Brenner and Hall urged a proactive approach to this public health problem, including reducing the CT-related radiation dose in individual patients and using other modalities, such as ultrasound and MRI, whenever possible.



### SCIENCE OF THE BRAIN

*Studies of the brain touch numerous research areas at P&S: psychiatry, pathology, neuroscience, neurology, neurological surgery, pediatrics, and rehabilitation medicine. Some brain research is facilitated by the New York Brain Bank at Columbia, which collects postmortem human brains to help neuroscientists – at Columbia and elsewhere – investigate specific psychiatric and neurological disorders.*

Dramatic

Discoveries



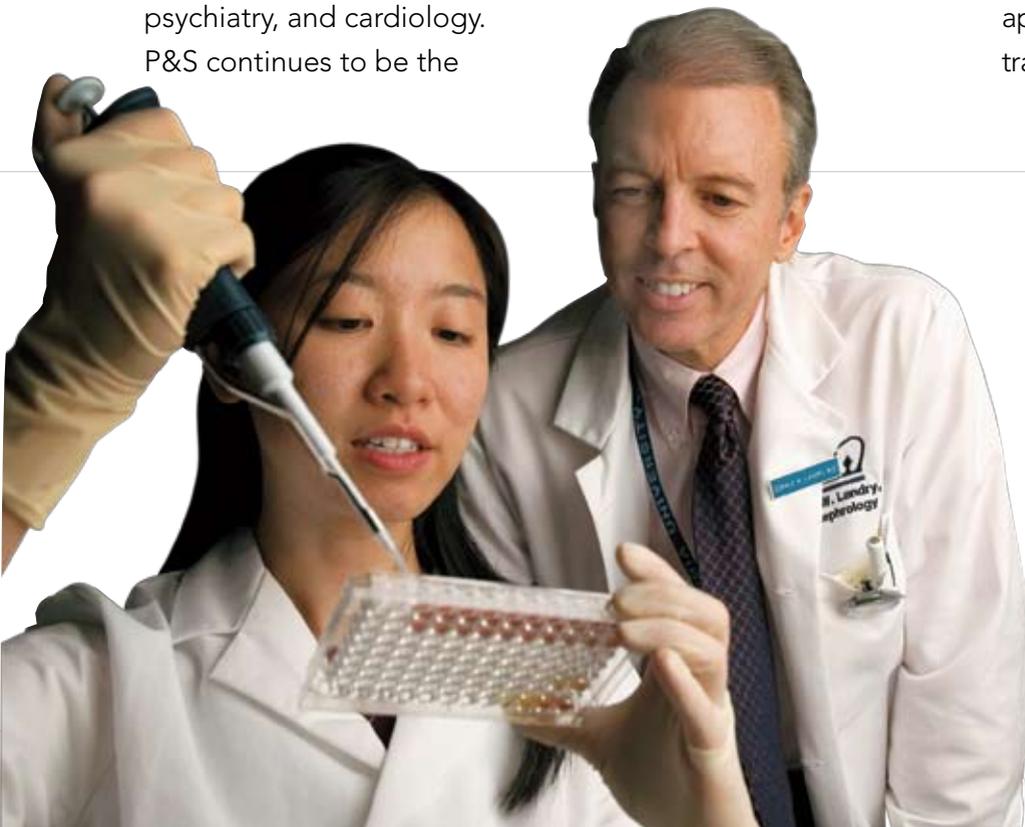
# Dramatic Discoveries: Research

Columbia's world-class research enterprise continues to expand the horizons of discovery and innovation in fields ranging from cell biology and biochemistry to neurology, psychiatry, and cardiology. P&S continues to be the

leader among New York City research institutions in funding from the National Institutes of Health, with \$292 million in grants for FY 2007.

Several exciting new pro-

grams, including the transplant initiative, the cardiovascular research initiative, and the stem cell initiative, all described on previous pages, demonstrate Columbia's commitment to a robust, multidisciplinary approach to basic, clinical, and translational research.



# Non-familial schizophrenia

*Schizophrenia affects approximately 1 percent of the population worldwide. About 40 percent of the disease is thought to be inherited, with the other 60 percent sporadically showing up in people whose family history does not include the disease. “We now know the cause of around 10 percent of the cases of sporadic schizophrenia,” says Maria Karayiorgou, M.D. “Schizophrenia is not as much of a ‘big black box’ as it used to be. The identification of [these] genes lets us know what brain development pathways are involved in disease onset, so that in the future we can look at better ways of treating this devastating disease.”*

## NYC’s First Cardiac Stem Cell Trial

In a first-of-its-kind trial for New York City, Columbia investigators have transplanted a 62-year-old man’s own stem cells into areas of his heart affected by chronic myocardial ischemia, a severe form of coronary artery disease that affects as many as 250,000 people every year. Columbia is one of multiple sites nationwide investigating autologous cellular therapy as a treatment for this treatment-resistant form of heart disease, as part of the nation’s first phase II study of adult stem cell therapy for the condition.

In a non-surgical procedure, the stem cells are injected directly into affected areas of the heart, where they may stimulate the growth of new vessels. Earlier phase I trials showed promise for the therapy. “We hope to show that patients have the means themselves — namely, their own stem cells — to repair their hearts burdened by otherwise untreatable, and often painful, coronary disease,” says Warren Sherman, M.D., associate professor of medicine and Columbia’s principal investigator for the trial.

## New Frontiers for Slowing Dementia

A brain network located within the frontal lobe associated with cognitive reserve may hold promise in helping people with dementia maintain function despite declines due to dementia or aging, according to new research from experts at Columbia’s Taub Institute for Research on Alzheimer’s Disease and the Aging Brain and the Gertrude Sergievsky Center.

Participants in the study were given a series of memory tasks to complete while undergoing fMRI. As the tasks became more difficult, investigators found that some participants with higher levels of cognitive reserve were able to activate the brain network, while those with lower

levels were not. The network was found more often in younger participants, indicating that the network may degrade during the natural aging process, reported Yaakov Stern, Ph.D., the study’s principal investigator, professor of clinical neuropsychology, and director of the Sergievsky Center’s Cognitive Neuroscience Division. He suggests that treatments designed to slow or stop the degradation of this key brain network could increase cognitive reserve and prevent or delay the onset of age-related memory conditions such as Alzheimer’s disease.

Columbia scientists have found a link between a history of hypertension and mild cognitive impairment, a condition that is often a precursor to dementia, suggesting that successful management of high blood pressure may not just have cardiovascular benefits but also could help prevent cognitive impairment.

Christiane Reitz, M.D., Ph.D., a postdoctoral research scientist in the Sergievsky Center, and colleagues studied 918 individuals over age 65 for an average of nearly five years and found that hypertension was associated with a significant increase in mild cognitive impairment. The reasons are unclear, although the researchers noted that hypertension is a known risk factor for subcortical white-matter lesions commonly found in Alzheimer’s disease. Hypertension also may contribute to a dysfunction in the blood-brain barrier, which has been posited as playing a role in the development of dementia.

## Exploring a Link Between Alzheimer’s and Stroke

People who have had a stroke face nearly twice the risk of developing Alzheimer’s disease than those who have never experienced such a debilitating “brain attack.” A new study from Columbia scientists helps to explain why.

The study identified the pathway activated by strokes that leads to increased production of the toxic amyloid beta ( $A\beta$ ) peptides that are believed to play a key role in the onset of Alzheimer's. Lead author Karen Duff, Ph.D., professor of pathology in psychiatry and in the Taub Institute, found that  $A\beta$  production rises with an increase in production of a peptide called p25, something that occurs following a stroke. Her team pinpointed the pathway involved: p25/cdk5, in which higher levels of p25 lead to enhanced activity of the cdk5 molecule, which in turn leads to a rise in the production of  $A\beta$ . Dr. Duff is working to verify the pathway's role, using postmortem tissue from stroke patients.

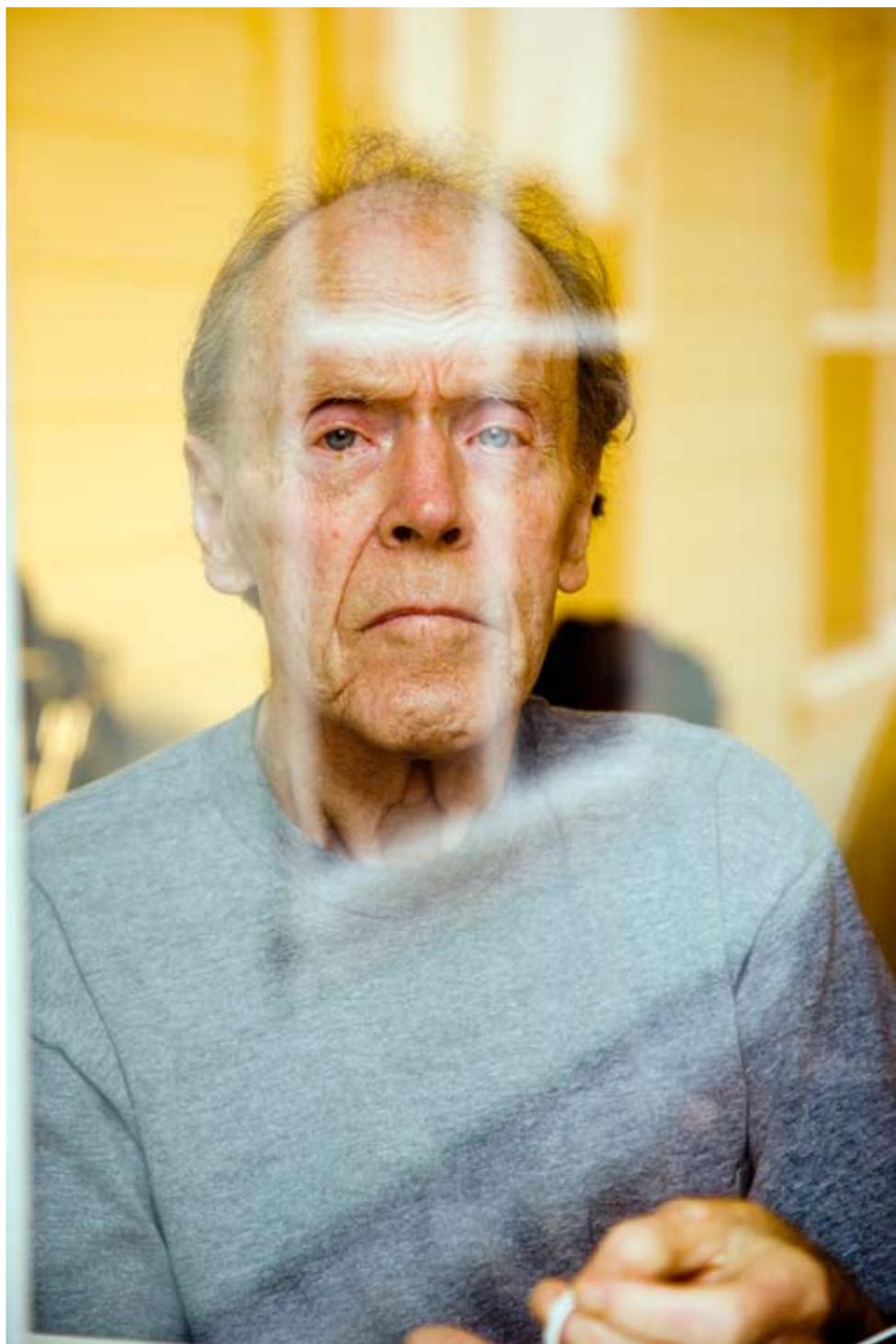
## Elucidating the Genetics of Schizophrenia

Columbia scientists continue to open dramatic new windows into the genetic underpinnings of schizophrenia, with two major studies released this year, both pointing to a key role for a deletion in a region of chromosome 22 known as 22q11.2.

Both studies were led by Maria Karayiorgou, M.D., professor of psychiatry and an expert in the genetics of schizophrenia who was instrumental in identifying deletions of 22q11.2 as a primary risk factor for schizophrenia.

In the first study, Dr. Karayiorgou's team pinpointed spontaneous genetic mutations that lead to at least 10 percent of non-familial cases of schizophrenia. These mutations were eight times more likely to be found in people with schizophrenia than unaffected individuals. The study involved a genome-wide scan of more than 1,000 individuals, including 152 individuals with schizophrenia, 159 individuals without the disease, and biological parents of all 311 individuals.

One of the *de novo* mutations identified in more than one affected individual was



a deletion of 22q11.2. This region is now confirmed as the only known recurrent such mutation linked to schizophrenia. By confirming 22q11.2's role and adding a new set of mutations for investigation,

**IN THE GENES** Scientists are digging deeper into the genetics of schizophrenia. Findings could help researchers account for the persistence of schizophrenia in the population despite low birth rates among people with the disease.

# Cancer genes

*In 1997, Ramon Parsons led one of the two teams that independently discovered PTEN, one of the most important tumor suppressor genes altered in breast cancer and in brain and prostate cancers. PTEN is now recognized to be mutated in about 30 percent of all cancers, making it the second most mutated gene in cancer after p53.*

the study opens up new avenues for improved schizophrenia treatments.

The second study demonstrates how abnormalities in microRNAs may contribute to the behavioral and neuronal deficits associated with schizophrenia. Digging further into chromosome 22, Dr. Karayiorgou and her colleague, Joseph A. Gogos, M.D., Ph.D., associate professor of physiology and neuroscience, uncovered a previously unknown alteration in microRNA production in a mouse designed to have the same 22q11.2 deletion associated with schizophrenia in humans. This alteration, a deficiency in the Dgcr8 gene, suggests a completely novel, previously unsuspected group of susceptibility genes and brings investigators another step closer to understanding the biological roots of schizophrenia.

## Understanding BRCA1's Cancer-Causing Mechanism

More than a decade ago, BRCA1 was identified as a major susceptibility gene for breast cancer, with some mutations in the gene conferring a lifetime risk of developing breast cancer that can be as high as 80 percent. Columbia researchers knocked out a powerful tumor suppressor gene known as PTEN to identify for the first time how those mutations may lead to cancer.

The link between BRCA1 mutations and PTEN was discovered by Avon Foundation Professor of Medicine and Pathology Ramon Parsons, M.D., Ph.D. When PTEN is knocked out, says Dr. Parsons, it is a "direct hit to a cell growth pathway. Once a cell loses PTEN, it has a growth advantage over its neighbors and is on the road to cancer." (In 1997, Dr. Parsons led a team of researchers that first discovered the PTEN gene.)

Most BRCA1 cancers are "triple negative," meaning they lack estrogen, progesterone, and HER2 receptors, ren-

dering them resistant to powerful current treatments such as aromatase inhibitors and Herceptin. Many young women with BRCA1 mutations opt for prophylactic mastectomies rather than take the risk of developing a cancer with such a poor prognosis. But Columbia's new discovery may change that picture dramatically and soon: It immediately opens up new avenues for treatment, since drugs that shut down proteins in the PTEN pathway are already in phase I clinical trials.

## Major Trials for Drug-Eluting Stents

A new drug-eluting stent shows promise for improving outcomes in patients with coronary artery disease, according to results of the SPIRIT III trial, led by professor of medicine Gregg W. Stone, M.D., director of cardiovascular research and education in the Center for Interventional Vascular Therapy.

In the study, involving 1,002 patients with coronary artery disease, newer-generation stents releasing the drug everolimus were compared with widely used paclitaxel-releasing stents. The researchers found that patients with the everolimus stents had a 44 percent reduction in major adverse cardiac events at six months compared with the paclitaxel stent group and a 42 percent reduction in these events after one year.

Columbia vascular surgeons also are participating in the first trial of a drug-eluting stent to treat peripheral arterial disease. In the first U.S. trial in the leg arteries of drug-eluting stents, this large, randomized controlled trial, led by Nicholas J. Morrissey, M.D., assistant professor of surgery, includes patients who have already undergone angioplasty to open a blockage in the leg and experienced restenosis. "We are hoping that the drug-eluting stent will be effective in more than 90 percent of patients long-term," says Dr. Morrissey.



#### **RESEARCH POWERHOUSE**

*Columbia University has long been at the forefront of research and scholarship, and the research program at P&S contributes to that reputation by attracting more than \$300 million each year in research funding, including more National Institutes of Health grants than any other New York City medical school.*

### **Creating Motor Neurons from an ALS Patient's Skin Cells**

Harvard and Columbia scientists used a new technique to transform the skin cells of a patient with amyotrophic lateral sclerosis into motor neurons. The motor neurons were created using a new, widely reported technique called iPS (induced pluripotent stem cells), developed by researchers in Japan and Wisconsin, which reprograms human adult skin cells into cells that resemble embryonic stem cells.

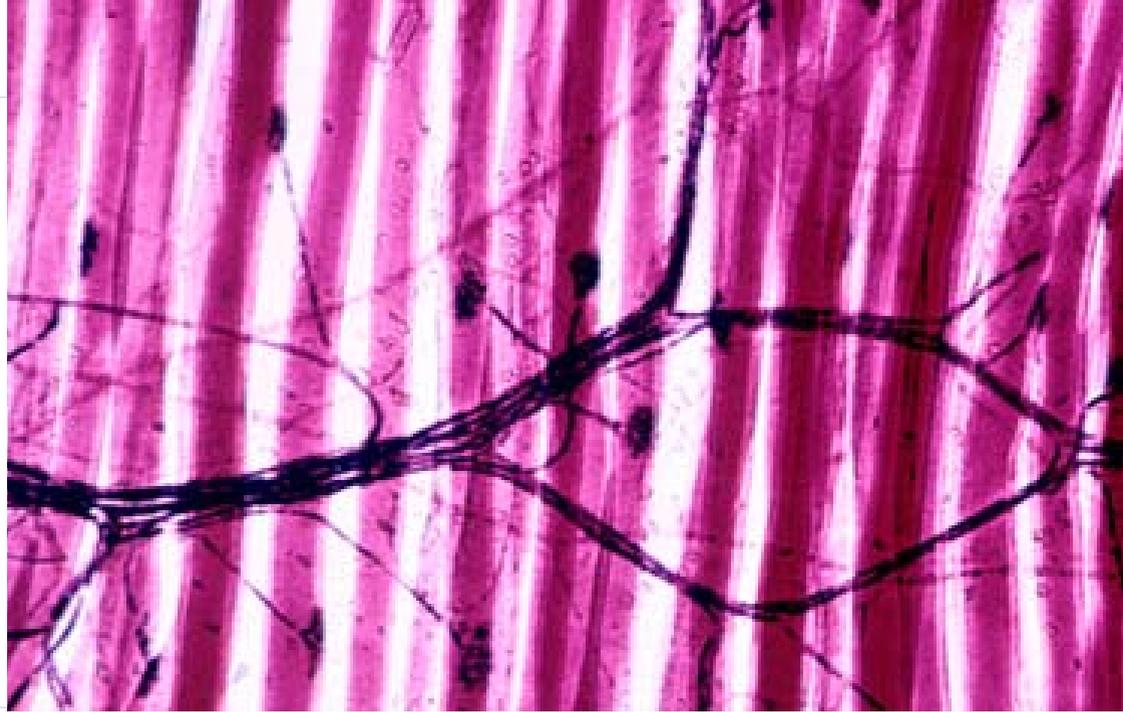
True cell replacement therapies for ALS are likely still years away, but the new cells will permit a patient's motor neurons to be studied in the laboratory, a goal that has long eluded ALS researchers. "Up until now, it's been impossible to get access to the neurons affected by ALS and, although everyone was excited by the potential of the new technology, it was uncertain that we would be able to obtain them from patients' skin cells," says the study's co-author Chris Henderson, Ph.D., professor of pathology, neurology and neuroscience, co-director of the Center for Motor Neuron Biology and Disease at Columbia, and senior scientific adviser of the Project A.L.S./ Jenifer Estess Laboratory for Stem Cell Research.

### **New Insights Into Premies' Brain Function**

Repeated doses of steroids given to women at risk of premature delivery, meant to improve their infants' lung

## NEUROMUSCULAR JUNCTIONS

Motor end plates on  
muscle fibers



function and boost survival, may also increase the babies' risk of developing cerebral palsy, according to a new multi-center study led by Ronald Wapner, M.D., professor of obstetrics & gynecology.

The new trial, one of the first to examine the risks of repeated courses of treatment, followed 556 infants, 248 of whom had received repeat doses of the steroid betamethasone in utero and 238 of whom had only one course of the drug. At ages 2 and 3, the children were developmentally identical, except that six of the repeat-steroid group had cerebral palsy, while only one of the single-dose group was affected. Based on these results, Dr. Wapner currently recommends that only a single course of steroids be used in women at risk of premature delivery, since repeated doses have shown no longer-term benefit.

Cerebral palsy is just one of the challenges faced by some premature infants. They are also at increased risk for autism and attention deficit disorder.

Using inexpensive, non-invasive high-density EEGs, P&S researchers are studying these tiny babies' brain function, hoping to identify factors that lead to problems and evaluate treatments.

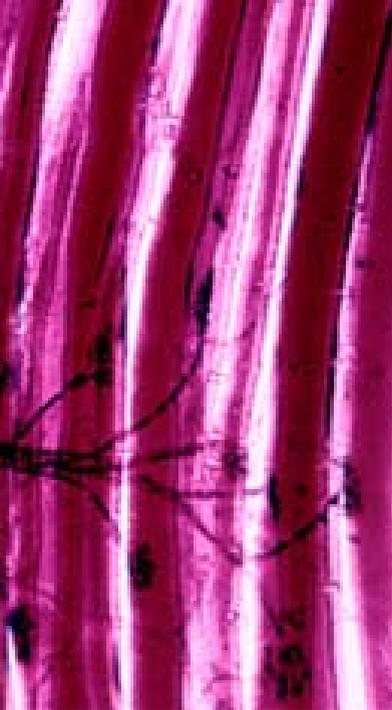
This research is likely unique, says Philip Grieve, Ph.D., assistant professor of clinical biomedical engineering in the Department of Pediatrics. Rather than the 16 or 25 sensors found in a traditional EEG, the high-density EEG contains 128 sensors, which offer direct measurements of potentially at-risk regions of the brain.

The researchers are expanding their pilot study to a larger group of premature and full-term infants and plan to correlate hospital EEG measures with long-term outcome studies. The results may enable researchers to learn which preemies will develop normally and which will have functional or developmental problems later in life and may provide insights for neonatologists designing therapies to treat multiple organ-system problems while supporting normal brain development.

## Leaky Muscle Cells Lead to Fatigue

A tiny leak inside the muscles is probably responsible for both the fatigue felt by marathoners and other extreme athletes at the end of a long workout and the exhaustion experienced by patients with heart failure. The leak, which allows calcium to continuously leak inside muscle cells, weakens the force produced by the muscle and also turns on a protein-digesting enzyme that damages the muscle fibers.

Andrew Marks, M.D., chair of physiology & cellular biophysics and the Clyde and Helen Wu Professor of Molecular Cardiology (in Medicine), found the leak in the muscles of mice put through an intense three-week swimming regimen and in human athletes after three days of intense cycling. Previously, he discovered the leak in the muscles of animals with heart failure. An experimental drug that plugs the leak of calcium, developed by Dr. Marks' team, alleviated the muscle fatigue in the study's mice, suggesting that it also



***Leaky muscles** The fatigue felt by marathoners and other extreme athletes at the end of a race is caused by a tiny leak inside their muscles, a leak that probably also saps the energy from patients with heart failure. The discovery of the calcium leak in fatigued animals and athletes is the first time anyone has pinpointed a precise mechanism for the involvement of a defect in calcium handling in limiting exercise capacity.*

may provide relief for chronic heart failure patients who struggle with getting out of bed, eating a meal, and other activities of daily life.

### **Racial Disparities Found in Lung Disease Treatment**

Blacks with chronic obstructive pulmonary disease are significantly less likely to receive a lung transplant than whites and more likely to die while waiting for a transplant, according to a retrospective study of 78 U.S. transplant centers. The study, led by David Lederer, M.D., M.S., assistant professor of medicine in the Division of Pulmonary, Allergy, and Critical Care Medicine, showed racial disparities that are similar to those found for individuals awaiting other types of transplantation, such as kidney and liver transplants, and those found among patients with other types of lung disease.

The study assessed the entire cohort of 280 non-Hispanic black adults and 5,272 non-Hispanic white adults diagnosed with chronic obstructive pulmonary disease

or emphysema who were awaiting lung transplantation between Jan. 1, 1995, and Dec. 31, 2004. Only 280 black patients were put on the lung transplant waiting list in the United States during the 10-year study period, about half as many as experts would have expected, says Dr. Lederer. The five-year incidence of lung transplantation was 61 percent for blacks and 68 percent for whites. Differences in insurance, socioeconomic status, and cardiovascular risk factors explained some, but not all, of the disparities.

### **Geneticists Identify Gene for Hair Texture**

Columbia geneticists have identified a new gene involved in determining hair texture in humans. The team's genetic analysis demonstrated that mutations in a gene, known as P2RY5, lead to hair that is coarse, dry, tightly curled, and sparse. This is the first discovery of a new gene whose primary function seems to be the determination of hair texture in humans, says Angela M. Christiano, Ph.D., the Richard and Mildred Rhodebeck Profes-

sor of Dermatology and professor of genetics & development.

"This genetic finding may inform the development of new treatments for excessive or unwanted hair, or potentially hair growth," says Dr. Christiano. P2RY5 is the first gene of a type known as a G-protein coupled receptor implicated in a human hair disorder, making it possible to develop drugs that target this receptor. The receptors represent the largest known class of molecular targets with proven therapeutic value. It is estimated that more than 40 percent of existing drugs work by targeting the receptors.

Shaping

Medicine's Future



# Shaping Medicine's Future: Education

**E**ach year, more than 600 medical students fill the halls, classrooms, and laboratories of P&S to nurturing their dreams of becoming physicians and

scientists and serving their community and the wider world. These young people are an extraordinary group. This year, as in all recent years, Columbia ranked among

the very top medical schools nationwide in student selectivity based on MCAT scores, grade-point averages, and acceptance rates.

*CLASS OF 2008*  
Three members  
of the 2008  
graduating class,  
from left:  
Julia Iyasere,  
Christopher  
Kellner, and  
Erica Kass





***Cloaked** The first White Coat Ceremony was held at Columbia P&S on Aug. 20, 1993. A White Coat Ceremony or similar rite of passage takes place at more than 90 percent of U.S. schools of medicine or osteopathy. At the ceremony, “the cloaking with the white coat – the mantle of the medical profession – is a hands-on experience... It is personally placed on each student’s shoulders by individuals who believe in the students’ ability to carry on the noble tradition of doctoring. It is a personally delivered gift of faith, confidence, and compassion.”*

*– the Arnold P. Gold Foundation*

#### **TRANSITIONS**

**Members of the Class of 2010 participated in the 2008 Steven Z. Miller Student Clinician’s Ceremony in preparation for their clinical years.**

During the 2007-2008 year, more than 7,000 potential students applied for one of the approximately 150 openings in the first-year class. Of the 152 students who enrolled, 32 are underrepresented minorities and eight are international students. In every qualitative category – grade point average and MCAT scores – enrolled students scored higher than the previous class. About a third of the class – 30 percent – studied disciplines other than biological or physical sciences in college, making for a well-rounded class of future physicians.

It is hardly surprising that our students continue their remarkable record of achievement once they reach P&S. Last year, 85 percent of our students did research with faculty, and 33 percent of them received prestigious fellowships such as those from the Doris Duke Foundation and the Howard Hughes Medical Institute. One in four of them took an extra year to pursue research goals, and 11 percent earned additional degrees, such as M.P.H., M.B.A., and Ph.D. Nearly half took an elective abroad, half of those choosing to serve in developing countries.

The education and clinical experience that we provide such world-class scholars is consistently ranked among the best that medical education can offer. This year, P&S was rated among the nation’s top medical schools by U.S. News & World Report, based on peer assessment, NIH research grants, and ratings of students by residency program directors. Several of our programs consistently rank in the top 10. We also continue to try to find ways to offer greater financial support, building on the growth of our endowments for scholarships and loans between 2003 and 2007.

#### **Curricular Innovation**

Beginning in the fall of 2009, with the class of 2013, we will launch an innovative new curriculum, which will compress pre-clinical studies into an 18-month block in which first- and second-year students will have both classroom and patient responsibilities. It will be followed by a major clinical year, comparable to the current third year, featuring 12-week blocks of exposure to core clinical areas, divided by one-week intersessions. The new curriculum will offer students more patient

contact earlier in their education, better integration of classroom teaching and clinical exposure, and more team-based teaching and learning. In their last year, students will complete an academic project in one of five areas: research, medical education, global health, social medicine, or community service.

The graduate program is also undergoing a significant makeover, which is being undertaken in two stages. Under the leadership of Richard Robinson, Ph.D., professor of pharmacology and associate dean of graduate affairs, the first phase of the reorganization, aimed at creating a uniform admission standard across all departments, was implemented in fall 2007. In the fall of 2008, initial curriculum changes were put into place, as part of a plan to create a doctoral program that encourages greater collaboration in both teaching and research. When fully rolled out, these changes will include a one-year course for all Ph.D. students in biochemistry, cell and molecular biology, and two "umbrella" courses in molecular genetics and the mechanisms of human disease.

## Facilities Facelifts

Ongoing renovations to our classrooms and other teaching spaces continue to transform the educational environment at P&S. We are making great progress in the creation of the new education center in the lower levels of the Hammer Health Sciences Center, while at the same time classrooms on the third and fourth floors of Hammer have been standardized with new audiovisual equipment and podiums. By 2009, all 45 classrooms will be transformed with the latest in educational technology.

With a new technology innovation award, the Augustus C. Long Health Sciences Library will install a network of flash screens in public areas around Columbia to help publicize information about library

resources, events, and programming. The grant, from the National Network of Libraries of Medicine, Middle Atlantic Region, will help to install the screens at the library in Harlem Hospital, the New York State Psychiatric Institute library, the Allen Pavilion, and the Russell A. Hibbs Memorial Library of New York Orthopedic Hospital.

Student services also are being upgraded. 5-Help, the medical center's help desk, is no longer just a computer troubleshooting service. It is now a one-stop shop to resolve virtually any problem related to working, living, and studying on campus. This change is part of an overall strategic effort to streamline support services and allow students, faculty, and staff to focus on their work.

## Unique Rheumatology Training Program Established

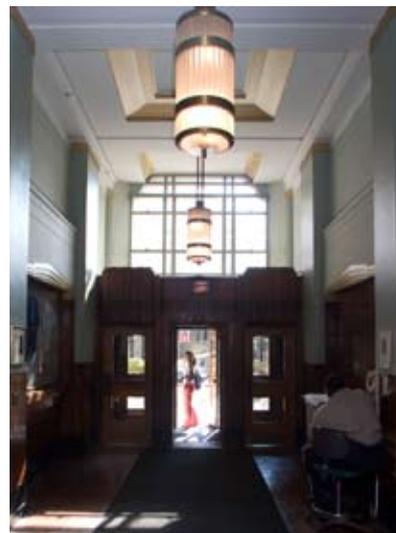
With a gift from generous supporters Ruth and Jerome Siegel, Columbia has established a new advanced training fund in the Department of Medicine's Division of Rheumatology. This fund will help bridge the gap between post-fellowship training and independent, laboratory-based investigations by physician-scientists who are committed to conducting immunology-related clinical or translational research. This unique program supports fellowships for researchers to pursue projects related to systemic lupus erythematosus, a particularly complex autoimmune disorder that largely affects young women, and other autoimmune disorders. The first Siegel Fellow was Giovanni Franchin, M.D., Ph.D., who continued studies to develop a novel therapeutic in systemic lupus erythematosus. In collaboration with investigators in the Naomi Berrie Diabetes Center, Dr. Franchin investigated the interaction of metabolism with development of B lymphocyte, a white blood cell that

comes from bone marrow and helps fight infections.

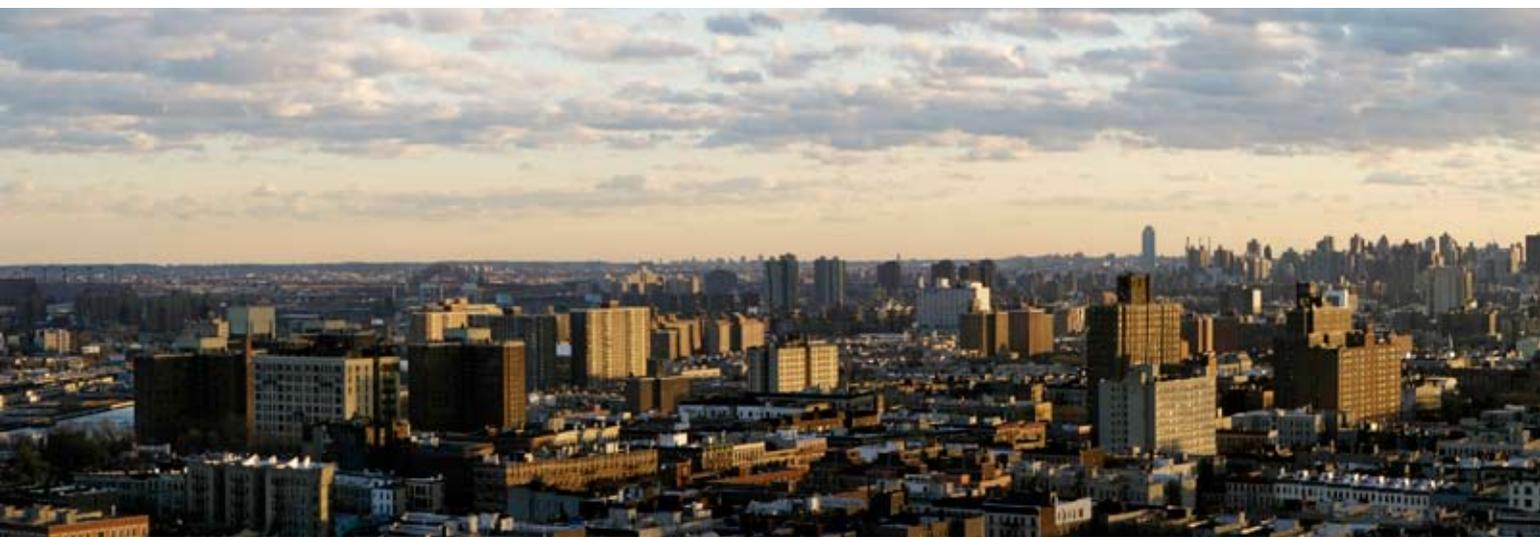
## Global Fellowships in Women's Health and HIV

P&S students now have exciting new opportunities to develop critical field experience in global health. The Women's Health and HIV Fellowship, launched this year by the Mailman School of Public Health's International Center for AIDS Care and Treatment Programs (ICAP), gives medical students and other graduate students from a wide range of disciplines the opportunity to work side by side with public health professionals at ICAP-supported sites in sub-Saharan Africa.

Students spend several months with ICAP country teams, working on projects ranging from the development of research protocols and evaluation of public health interventions, to programs offering services for survivors of domestic violence, to programs in oral health and nutrition. One of the first fellows, Lauren Trakimas, who completed a master of science in human nutrition at P&S, assessed nutrition pro-



**ART DECO RESIDENCE**  
Bard Hall has been housing P&S students since it opened in Fall 1931.



grams for ICAP Rwanda, including a weaning food program for HIV-exposed infants. "Sitting in a room filled to the brim with HIV-positive mothers and their exposed infants was a bit emotional," she said. "Then, when I looked at charts of most of the infants and saw that only one of them had an HIV diagnosis, I was amazed at how the weaning program was working in conjunction with prevention of mother-to-child transmission of HIV programs. It really touched home that programs like this are preventing HIV from being passed to the next generation."

### **Under the (Virtual) Microscope**

Columbia's first-year pathology students are part of a pilot group using a virtual microscopy tool that may transform the way medical and dental students learn about tissues. Instead of carrying a 20-pound microscope case back and forth to class, students in the first-year Science Basic to the Practice of Medicine and Dentistry course now have access, both in the classroom and remotely, to a new virtual microscopy tool: the SPMBD

Online Laboratory Manual, a Web-based interface that allows them to view high-resolution histological slides online. Students can still view glass slides with traditional microscopes, but the virtual microscope, created by Columbia faculty in collaboration with the Columbia Center for New Media Teaching and Learning, allows all students to view the same slide at the same time, facilitating teaching and group learning. "It's like having a microscope on your computer wherever you go," says assistant professor of clinical pathology Patrice Spitalnik, M.D.

### **Health Care for the Homeless**

An all-volunteer cadre of P&S students and residents launched the Columbia-Harlem Homeless Medical Partnership, a free student-run clinic serving people with a variety of health needs, from colds and flu to more serious illnesses. Last year, the effort provided free medical care for well more than 100 patients during approximately 200 visits in its clinic space in the basement of St. Mary's Episcopal Church on West 126th Street. In August

2008, the ambitious and growing program was featured in the journal *Lancet*.

The partnership was created by Marc Manseau'09 and Judy Chertok'07, now a Columbia resident in family medicine. The young doctors in the program provide care for anyone who walks in the door; about a quarter of their patients are living on the streets, while another quarter have unstable housing situations. Half of the patients are uninsured.

Under the supervision of James Spears, M.D., assistant clinical professor of medicine, pairs of preclinical and clinical students, who commit a full four years to the project, take histories, conduct exams, and do basic lab tests. They present their findings to Dr. Spears and the team makes a recommendation for care. In March 2008, the clinic began offering dental services through a volunteer partnership with students in the College of Dental Medicine.

The program is similar to the P&S student-run primary care clinic, CoSMO, for Columbia Student Medical Outreach,



which opened in March 2004 in space shared with the UrgiCare Clinic on the NewYork-Presbyterian Hospital/Columbia campus. The students, working with faculty, provide free medical care and prescriptions to uninsured residents of Washington Heights.

### Preparing for the Third Year with TeamWoRx

P&S students may think they know the other students in their class well by the time they have completed their first two years of medical school, but they learn more during the first week of the third year. TeamWoRx, a team-building event that kicks off the Transition Week as students move into their major clinical year, is a full week of activities that celebrate students' achievements and prepare them for new clinical learning experiences and responsibilities.

Earlier TeamWoRx programs involved skill building and athletic events, but today's TeamWoRx brings medical students together with members of the Washington Heights community through

service learning projects. Some groups of students painted a mural at La Plaza Beacon School; others painted the homes of survivors of domestic violence, helped to restore historic Highbridge Park, read to children at the Alianza Dominicana day care center, and took dancing lessons with senior citizens at the ARC Fort Washington Senior Center and the Church on the Hill Senior Center. Armed with disposable cameras, the students documented their service-learning experiences and shared them at the class dinner.

### Bringing Art to Pediatric Patients

For some P&S students, medicine and art converge as they work with children who have chronic illnesses. Instead of examining them or taking a history, they help them bend pipe cleaners into stick figures or turn glitter into stars. It is part of an innovative art program called "Wilma's Studio," which takes the boredom and anxiety out of the time seriously ill children spend in outpatient waiting

*City as Classroom* "The international nature of New York City and our community offers numerous opportunities for our students to develop as physicians skilled in understanding and treating patients from diverse backgrounds and cultures."

—Lisa A. Mellman, M.D.,  
Senior Associate Dean for Student Affairs

rooms and replaces it with creativity and entertainment.

At the pediatric neurology and pediatric oncology-hematology outpatient clinics, artists, educators, and student volunteers set up tables filled with colorful paper, crayons, paints, rainbow pipe cleaners, and glue to keep children entertained while they wait to see their doctors. The weekly program, founded by Wilma Siegal, M.D., a painter and retired oncologist formerly affiliated with Montefiore Medical Center and Albert Einstein Medical College, works with each child according to age and ability. Barbara Marco, the artist who currently runs the program, has inspired second-year medical students in her seminar on the arts in health care to volunteer their time to work with the children. The seminar brings four students into Wilma's Studio at the pediatric neurology clinic for six weeks to work with the artists and children and to learn about the growing field of art in medicine.

**STRENGTH IN LEARNING**  
*A P&S education has always been a good foundation for physicians, but the new curriculum for the class entering in 2009 is designed to emphasize lifelong learning and provide more flexibility for students to focus on areas of interest to them.*



## New Documentary Focuses on Ph.D. Education

A group of graduate students mentored by Associate Professor Lawrence Shapiro, Ph.D., are the subjects of "Naturally Obsessed: The Making of a Scientist," an unusual new documentary film that offers an inside perspective on the journey toward the Ph.D. degree.

Created by Richard Rifkind, a P&S alumnus, and his wife, Carole, a Graduate School of Architecture alumna, the film was shot over three years' time at Columbia. It also documents how X-ray crystallography enabled the discovery of the molecular structure of the AMPK protein, considered prime for targeted drug development because of its relevance to diabetes and obesity.

## A Multicultural Mosaic

For the past two Novembers, arts traditions from many cultures have come together at P&S with students performing in the Mosaic Multicultural Show. Three student cultural organizations — the Asian Pacific American Medical Students Association, the Black and Latino Students Organization, and the South Asian Health Sciences Association — teamed up with the Kraft Family Fund to produce the shows, which featured performances as diverse as modern Mandopop rap, West Indian dance, salsa, and poetry. Inspired by a South Asian cultural show at Columbia Law School, Mosaic attracted a large crowd from across the medical center schools and raised funds for the International AIDS Vaccine Initiative, a global not-for-profit concerned with the development of a vaccine for HIV/AIDS.

# Development Highlights 2007–2008

Columbia University's College of Physicians and Surgeons is grateful to our many donors who made significant gifts and pledges during the past year. Their contributions are investments that afford the resources for providing quality patient care, translating new discoveries quickly from the laboratory into clinical practice, and helping our fine medical students to become proficient in the art of healing.

The medical college received gifts and pledges totaling \$142.4 million during fiscal year 2008. Listed below are some of the many generous commitments that help P&S to continue to define the future of medicine.

Advancing its mission, "The Care Until the Cure," the Naomi Berrie Diabetes Center celebrated its 10th anniversary on Oct. 28, 2008. Angelica Berrie and the Russell Berrie Foundation, once again, provided extraordinary support for the center.

The Addie and Harold Broitman Foundation supported research on posterior cortical atrophy being conducted under the joint leadership of Eric Kandel, M.D., University Professor and director of the Kavli Institute for Brain Science, and Scott Small, M.D., associate professor of neurology in the Taub Institute for Research on Alzheimer's Disease and the Aging Brain.

A number of donors lent support to help the Department of Ophthalmology further its mission to preserve vision and understand, prevent, and treat vision disorders. Among them are Shirlee and Bernard Brown, who made a pledge to establish a professorship of ophthalmology to support the director of the glauco-

ma program. The Louis & Gloria Flanzer Charitable Trust made a significant commitment to establish the Gloria and Louis Flanzer Vision Care Center facility that will offer a full range of ophthalmic specialties and comprehensive diagnostic testing. The Burch Family Foundation made a generous gift to renovate, maintain, and equip this new vision care site.

The Carmel Hill Fund renewed its generous support of the TeenScreen National Center for Mental Health Checkups at Columbia University, formerly known as Columbia University TeenScreen. The TeenScreen National Center is an initiative of the Division of Child and Adolescent Psychiatry focusing on the prevention of teen suicide and reduction of disability associated with mental disorders through early detection.

The Boomer Esiason Foundation provided funding to establish and endow the Gunnar Esiason Adult Cystic Fibrosis and Lung Program in the Department of

Medicine. The first of its kind in the New York metropolitan area, the new program will offer sophisticated, comprehensive, and family-based care to cystic fibrosis patients and provide access to the newest and most promising medications and advanced physiotherapy to improve the lives of adult patients with cystic fibrosis.

Loren Eng and Dinakar Singh, who, with their Spinal Muscular Atrophy Foundation, generously support the Motor Neuron Center and the Spinal Muscular Atrophy Clinic, as well as the Department of Obstetrics and Gynecology, this year made a major commitment to establish a professorship in pediatric neurology.

The Gatsby Charitable Foundation provided a multiyear gift in support of the Gatsby Initiative in Brain Circuitry, a university-wide program under the auspices of Columbia's Center for Neuroscience Initiatives. Focusing on the development of novel strategies and technologies for analyzing the neural circuits that control



defined behaviors, the initiative provides support for students, pilot grants, recruitment of additional neuroscientists, and collaborations with University College, London.

Adding to the legacy of support that the Goldthwaite family has provided to P&S over the years, the Goldthwaite Foundation made a pledge to advance research in colorectal cancer through the Laparoscopic Oncology and Physiology Laboratory in the Department of Surgery.

The enduring commitment of our most generous benefactors, Florence and Herbert Irving, fuels our progress in cancer and clinical research. Mr. and Mrs. Irving continue to provide steadfast support for the Herbert Irving Comprehensive Cancer Center, the Irving Institute for Clinical and Translational Research, and for the Irving Scholars Program, which assists

young physician-investigators in pursuing research considered too preliminary to receive NIH support.

The Jaharis Family Foundation pledged support to fund initiatives in the Department of Ophthalmology and to the Cardiovascular Research Initiative to foster advances in cardiovascular genetics, vascular biology, and developmental biology.

The Kurland Family Foundation continues to fund the Anne S. Cohen Professor in Pediatric Ophthalmology, to honor the memory of Dr. Cohen.

The Kavli Foundation continues its support, begun in 2004, of the Kavli Institute for Brain Science. Under the leadership of Eric Kandel, M.D., the Kavli Institute, which includes Richard Axel, Thomas Jessell, Rafa Yuste, Larry Abbott, Craig

Bailey, Randy Bruno, Gerald Fischbach, Michael Goldberg, Rene Hen, Joy Hirsch, Ken Miller, Daniel Salzman, Steven Siegelbaum, and Scott Small, is pursuing the logic of the neural circuitry of the brain. The Institute's mission is the development of new experimental and computational strategies for studying the complex neural circuitry that is the basis of higher order behavioral function.

David H. Koch pledged support to the Paul Marks Scholars Fund. The new endowed fund will provide matching funds for academic departments to recruit outstanding young scientists, and to retain those who have distinguished themselves as top physician-scientists. Paul Marks Scholars will embody our research mission to discover and develop innovative and effective biomedical opportunities in the service of society.

May 2008 marked the 10th anniversary of the Integrative Therapies Program in the Division of Pediatric Oncology. Helaine Lerner, who founded the Carol Ann Resource Center in the division, made a commitment from The New Tamarin Foundation to the program, along with another pledge to match additional donations. The goal is for the program to serve as the standard of care in complementary and alternative medicine for children with cancer.

Mr. and Mrs. Stephen Lieber and the Essel Foundation have continued their commitment to the Lieber Center for Schizophrenia Research in the Department of Psychiatry. The support enhances the clinical care, research, and educational initiatives of the Lieber Center.

The Robert W. Matschullat Family Foundation made a pledge to the Department of Pediatrics, division of infectious diseases, to establish the John M. Driscoll Jr., M.D., and the Yvonne T. Driscoll, M.D., Professorship of Pediatrics.

The continued support of the Paul and Irma Milstein Foundation to the Irma and Paul Milstein Laboratories in the Department of Surgery keeps Columbia at the forefront of clinical and basic research advances in Alzheimer's disease, diabetes, and cancer.

Family and friends of the late Muzzi Mirza made significant gifts and pledges in support of the Muzzi Mirza Pancreatic Cancer Prevention and Genetics Program in the Pancreas Center. The campaign that established the program was led by Mr. Mirza's wife, Susan, and former business associates Stephen Berger, Paul Barnett, Douglas Hitchner, William Hopkins, Brian Kwait, and Douglas Rotatori.

Joseph M. and JoAnn M. Murphy continued their outstanding legacy of support for the Naomi Berrie Diabetes Center with a generous gift to establish the Christopher J. Murphy Memorial Professorship of Diabetes Research in memory of their son, who was dedicated to finding a cure for diabetes.

The Parkinson's Disease Foundation has supported Columbia's research efforts in finding the cause of, and a cure for, Parkinson's disease since 1957. The new pledge furthers the ongoing partnership and helps Columbia's researchers and clinical doctors to make strides in research, training, and study of Parkinson's disease and the quest to uncover the pathogenesis of the disease.

Stewart Rahr and Kinray made a generous contribution to advance research on the biology, diagnosis, and treatment of eating disorders. The gift also established the Rahr Scholars Program, which supports young investigators conducting pilot research studies in the field of eating disorders.

The Mortimer D. Sackler Foundation made a generous gift to the Sackler In-



stitute for Developmental Psychobiology. The Sackler Institute assembles Columbia scientists from different disciplines whose research interests focus on early development and how these relate to the etiology and treatment of psychiatric illness.

The St. Giles Foundation founded the St. Giles Comprehensive Sickle Cell-Thalassemia Program at Columbia University, with the goal of establishing a national model for the care of patients with sickle-cell disease, thalassemia, and other hemoglobinopathies. The overall goal of the program is to make specialized sickle cell disease and thalassemia-related care available to children and adults by providing a medical home for multidisciplinary management, periodic inclusive evaluation, genetic counseling, community outreach, and patient-centered support.

Longtime friend Lynn Shostack supported the David A. Gardner New Initiatives Fund, an unrestricted fund for the discretionary use of the executive vice president for Health and Biomedical Sciences and dean of the Faculties of Health Sciences and Medicine. The fund has provided support for the Dean's Pilot Project Award, a three-school initiative

that funds the research of promising young investigators, and provided funds for new laboratory equipment to enhance the work of researchers.

Lynn and Edward Streim/The Chernow Charitable Trust pledged support to the Department of Urology to help renovate the department's laboratories in the Black Building. The Chernow family's legacy of support for the Department of Urology is one that has endured for years.

The Henry and Marilyn Taub Foundation continues to provide outstanding support to the Taub Institute for Research on Alzheimer's Disease and the Aging Brain. The Institute is generating key insights into the causes, progression, and prevention of degenerative brain diseases.

Unrestricted gifts are essential for allowing the medical school to respond in timely fashion to unforeseen opportunities and to the ever-changing world of academic medicine. The Clyde and Helen Wu Family Foundation provided funds for the dean's discretionary use, giving Dr. Goldman the means to implement programs that are vital to the success of the College of Physicians and Surgeons.

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M.D. program 585  
M.D./M.P.H. 8  
M.D./Ph.D. program 85  
Other M.D. programs 43  
Graduate programs 787  
Full-time faculty 1,853  
Living M.D. alumni 7,200  
Budget (FY07) \$1.187 billion  
Endowment \$1.463 billion  
Endowed chairs 162  
Research support (FY08) \$401.4 million

##### **Degrees granted, July 2007 to June 2008**

M.D. 138  
M.D./M.P.H. 4  
M.D./ Ph.D. 4  
M.D./ M.B.A. 4  
M.D./D.D.S. 3  
Ph.D. 74  
Doctor of physical therapy 31  
M.S. in occupational therapy 42  
M.S. in nutrition 39  
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