

Columbia Medicine

Columbia University College of Physicians & Surgeons

SPRING/SUMMER 2015



POTATO CHIPS

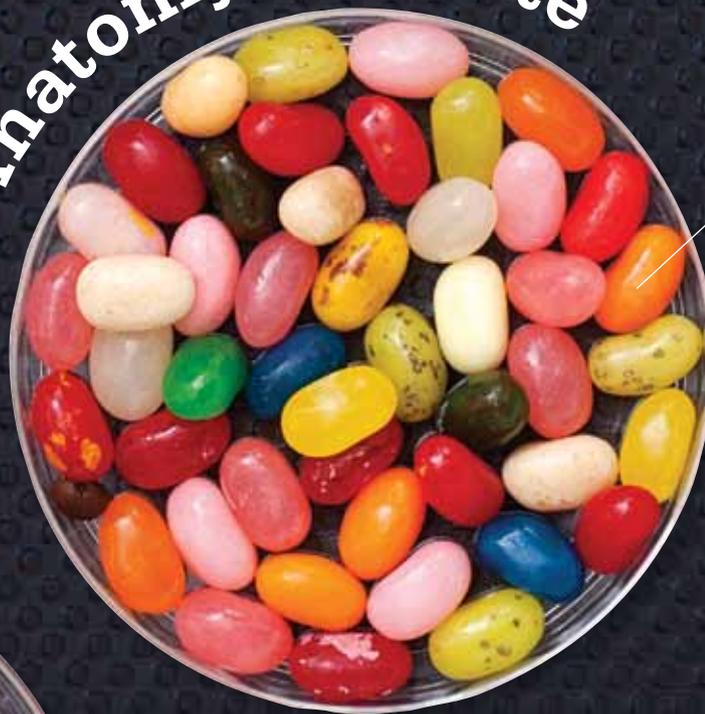
SALTY



DARK CHOCOLATE

BITTER

Anatomy of Taste



JELLY BEANS

SWEET



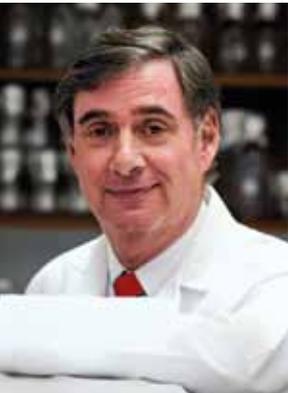
TOMATOES

UMAMI



LEMONS & LIMES

SOUR



MANHATTAN TIMES / MIKE FITELSON

● FROM THE DEAN

Dear Readers,

Excellence and success are two terms we proudly use to describe our programs and the individuals and teams that staff them. Neuroscience is one of many fields at Columbia in which the two terms intersect, and we measure our excellence and success in discoveries, grants, published papers, national and international recognition of our faculty, and reputation.

We also increasingly use the term *partnership* to describe our research, patient care, and community programs, and that term also applies to Columbia neuroscience, a field that has become increasingly interdisciplinary. The P&S faculty who are members of the Mortimer B. Zuckerman Mind Brain Behavior Institute will move to the Jerome L. Greene Science Center when it opens in the next few years on Columbia's new Manhattanville campus. The move of many of our neuroscience labs to Manhattanville will enable Morningside and CUMC colleagues to work in partnership and in close proximity. It also will free up space on our campus that will enable us to undertake the largest faculty recruitment effort in nearly 20 years, as much impact as building an entire new research building.

A few examples of Columbia's strength in neuroscience are reported in this issue. The researchers who are profiled study important brain functions from different perspectives to illuminate the science behind movement and taste, showing the benefits of interdisciplinary—and intercampus—partnership in neuroscience.

Neuroscience and other areas of study find us crossing campus boundaries on a routine basis. Long an active partner with NewYork-Presbyterian Hospital in patient care, we are now partnering more and more with our Morningside colleagues in research and education. The Columbia-wide precision medicine initiative is a good example of that. In this issue you can read a Q&A with David Goldstein, the leader of our new Institute for Genomic Medicine, who explains the importance of the institute's work to our overarching goals for precision medicine. Tom Maniatis, leader of Columbia's precision medicine initiative, and geneticist Wendy Chung attended the January announcement at the White House of the federal government's plans to support precision medicine. Columbia's intellectual resources in partnership with the government's commitment should speed the growth of this important field.

Our work with the Morningside campus extends beyond neuroscience, precision medicine, and other formal academic collaborations. We have begun conversations with Morningside for new joint degrees that will take advantage of the combined strengths of our campuses. What results from those conversations will offer our students more robust choices as they pursue their individual definitions of excellence and success.

These partnerships reinforce our commitment to serving our students, patients, neighbors, and others who indirectly benefit from our programs, and we welcome your support of Columbia's unique pursuit of excellence and success.

With best wishes,

Lee Goldman, MD, Dean
lgoldman@columbia.edu

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Precision Medicine: A White House Initiative and a Conversation with David Goldstein

**Federal Government's
New Focus on
Precision Medicine
Dovetails with
P&S Strategic Plan**

Two Columbia faculty members participated in President Obama's presentation of details of the precision medicine initiative he announced during this year's State of the Union address. Columbia University's precision medicine initiative was announced by CU President Lee Bollinger in early 2014, and the P&S strategic plan has identified precision medicine as a priority.

Tom Maniatis, PhD, director of Columbia's university-wide precision medicine initiative and chair of the Department of Biochemistry & Molecular Biophysics at P&S, and Wendy Chung, MD, PhD, associate professor of pediatrics and of genetics & development at P&S, were invited to the White House to participate in the announcement. Dr. Chung directs the clinical genetics program at Columbia and conducts research on the genetic basis of metabolic disorders. Both are members of the Columbia precision medicine task force. Columbia's precision medicine initiative has gained steam with the arrival in January of David

B. Goldstein, PhD, as founding director of Columbia's Institute for Genomic Medicine, a university-wide program to integrate genetics and genomics into research, patient care, and education at Columbia University Medical Center and NewYork-Presbyterian Hospital.

"My hope in coming to Columbia is that we will be able to ensure that all patients who could benefit from genome sequencing will have their genomes not only sequenced, but carefully interpreted," says Dr. Goldstein.

Dr. Goldstein, author of more than 200 papers on the clinical applications of genomic analysis in AIDS, hepatitis C, schizophrenia, and epilepsy, was recruited from Duke University, where he was director of the Center for Human Genome Variation and the Richard

and Pat Johnson Distinguished University Professor with appointments in molecular genetics & microbiology and biology. Here are answers to questions posed to him about the promise of precision medicine and his vision for the Institute for Genomic Medicine.

Much of your research has been in the field of pharmacogenetics, looking for clues in a patient's genetic traits or disease profile to predict responsiveness to a particular drug protocol. How is that going?

There has been a lot of enthusiasm and even hype for this work, and the reality is that we still have very few real-world examples. And while I would not want to add to the hype, I do personally expect that to change before too long. There's every reason to believe that understanding the exact underlying molecular cause of a condition will guide how we treat it, and we in fact already see very clear examples of this in some of the work we and others are doing in epilepsy.

Why the move to Columbia?

The work that needs to be done in precision medicine goes beyond the boundaries of a single investigator's lab, no matter how big that laboratory is. The vision Columbia has outlined is the most integrative and comprehensive I've seen, bringing in the Morningside campus, CUMC, and NewYork-Presbyterian with a charge to pursue clinically applied investigations. As soon as I heard President Bollinger articulate his vision, I knew I wanted to be involved.

What is your own vision for the institute?

We're going to pick a few key clinical areas where we think we can make a really big difference. One major focus will be on epilepsy and using comprehensive genomic approaches to figure out what's wrong with kids who have serious genetic diseases. A more general focus will be to carefully interpret the genomes of all patients with unresolved or undiagnosed genetic diseases.



Tom Maniatis

JORG MEYER



David Goldstein

JÖRG MEYER

How might the institute's work help someone with epilepsy?

If we sequence a patient with epilepsy and find there's a mutation in a particular potassium channel gene, we can put the protein that gene encodes into a well-established laboratory protocol and test an FDA-approved drug that targets that protein. My colleagues in Melbourne, as part of the Epi4K and Epilepsy Phenome/Genome Project research teams, are already pursuing exactly this kind of work. You can prove that the effects of a mutation that causes epilepsy can be interrupted in the lab with a particular drug. Then you know to try that drug in patients with that kind of epilepsy.

This is where having an integrated program is so important. If we just get the mutation, we can't do much with that. We have to understand what that mutation does, biologically, and how it relates to the mutations in other patients, so we can group patients based on the different underlying processes that have gone awry and not just their symptoms. One of my highest priorities at Columbia is to create a mechanism for handing over the mutations to really good biology labs that can investigate how those mutations create the effects that they do.

What do you tell patients about the current realities of precision medicine?

When I talk to families about participating in the kind of research we do, I always tell them that there is a pretty decent chance that we will find out what is wrong genetically, but I also tell them that there isn't a very high chance that we will be able to do something clinically that will make a big difference. Sometimes we really do learn how to essentially save a kid, just by looking at the genome, and that is the most wonderful thing that can happen. But it is a minority of cases and we have to make that clear.

So why do families still choose to participate?

Most families and patients want to know why. Even if we can't make a big difference clinically, simply putting a name to a condition, and providing a genetic explanation, is of real value. It provides peace of mind. It provides an explanation. It allows families to reach out to other families that they know have similar conditions, to create support groups, to create advocacy groups. Explaining the basis of disease is a part of practicing good medicine, and genomics is a critical part of that effort.

Where do you draw inspiration in your quest for clinically relevant genomics?

In terms of personalized and precision medicine, cancer treatment is no longer aspirational—it's demonstrated. Everyone agrees that the future of cancer therapeutics is to target treatment to exactly what has gone awry in tumors. All sorts of great work in that field is already going on at Columbia. My personal ambition is to add a few more disease areas to that roster. I want to make epilepsy next. And I want to make sure we do everything for kids with undiagnosed disease, for complicated pregnancies. Cancer is an example of where we want to be.

Learn more about the P&S Strategic Plan and Columbia's precision medicine initiative



P&S Strategic Plan:
bit.ly/PSstrategicplan

Precision Medicine:
bit.ly/ColumbiaPrecisionMedicine

New Neurology Division Created to Track Outcomes

As a fledgling neurologist in the early 1990s, Mitchell Elkind, MD, had few treatment options to offer patients once he made a diagnosis. Nothing for dementia or stroke and just one drug for multiple sclerosis. Over the past few decades, new treatment options have emerged—giving rise to the need to track outcomes.

“There’s a lot more available,” says Dr. Elkind, “so the question has become, ‘Which is the best treatment and what’s going to give the patient the best quality of life when you consider side effects and benefits and even the financial cost?’”

In October, in a joint effort with the Gertrude H. Sergievsky Center, the Department of Neurology formed a new research division to answer those questions. Dr. Elkind, professor of neurology in P&S and of epidemiology in the Mailman School of Public Health, is founding director of the Division of Clinical Outcomes Research and Population Sciences (Neuro CORPS), one of the nation’s first such divisions. Initially, Neuro CORPS will leverage resources already available at Columbia—through the Department of Neurology, the Sergievsky Center, the Department of Medicine, the Department of Biomedical Informatics, Mailman,

Columbia’s nursing and engineering schools, and the Irving Institute for Clinical and Translational Research.

The timing could not be better, says Dr. Elkind. An aging population means a growing demand for optimized treatments as the incidence of stroke, dementia, and other neurological conditions increases. The Affordable Care Act has imposed requirements for proven, cost-effective treatment protocols and also created new opportunities for discovery through the widespread adoption of electronic medical records.

In September, Dr. Elkind, also a member of the stroke division in the Department of Neurology, submitted a proposal for funding the first Neuro CORPS investigation, to weigh the relative merits of inpatient and outpatient evaluation of patients with transient ischemic attacks and minor strokes. “At present, patients are managed in a variety of ways and settings, including outpatient, inpatient, and often during prolonged emergency department stays,” says Dr. Elkind, who seeks to test a protocol based on rapid assessment in an outpatient setting.

“Defining optimal evaluation and treatment for these patients, including risk stratification

and referral to urgent outpatient specialty clinics, would have the benefits of preventing stroke, improving patient outcomes and satisfaction, reducing emergency department and hospital length of stay, optimizing resource utilization, and reducing costs.” An outpatient approach, Dr. Elkind notes, has the added benefit of enhanced compatibility with Medicare’s reimbursement regulations on the amount of time a patient may be held for observation without being formally admitted to the hospital and also would reduce the risk of hospital-acquired infections.

Other topics of investigation for Neuro CORPS will include health services research and emerging approaches such as social network analysis, agent-based modeling, and decision analysis. In addition to bringing together scholars throughout the Department of Neurology for weekly conferences to focus on outcomes research, the division expects to hire three new faculty members. “There are a lot of methodological changes going on in research, at the same time that the health care climate is changing,” he says. “We want to be at the forefront of the science of outcomes research.”

Push from P&S Students Leads to New Global Health Lecture Series

As the first case of Ebola was diagnosed in Texas in 2014, 50 Columbia students had one of the world’s foremost infectious disease experts to themselves in a new global health lecture series.

While Stephen Morse, PhD, professor of epidemiology at Mailman, updated the situation for the students in the inaugural Edgar M. Housepian Global Health Lecture Series, his phone buzzed with calls from reporters.

“Eventually, he silenced it to speak with us,” says Nathan Brand’17, who helped create the series. “It shows we’ve done a good job of creating lectures that are interesting and pertinent to current events.”

Giving students an understanding of the current issues in global health is one of the main goals of the lecture series, which evolved from conversations Mr. Brand had with fellow second-year students David Bridgman-Packer and Rachel Criswell, president of the students’ international health interest group.

“Originally, we had the idea of starting a global health journal club, because we wanted a way to learn the canonical articles in global health and to learn from people who have been in the field,” Mr. Brand says.

Columbia has extensive programs in global health but it is challenging for students to know about everything happening in the field. The students approached Stephen Nicholas, MD, associate dean for admissions at P&S, professor of pediatrics and population & family health, and director of the IFAP Global Health Program and the scholarly projects global health track, who embraced the idea and broadened it into a lecture series. The intention of the series is not only to supplement the P&S curriculum, but also to show students Columbia’s great capacity in global health and to help students find mentors in the field.

The effort resulted in nearly 20 CUMC faculty members collaborating to organize and teach the series. Lectures were given last fall by Columbia experts in global health, including Rachel Moresky, MD, assistant professor of population & family health and of medicine and founding director of CUMC’s International Emergency Medicine Fellowship; Wafaa El-Sadr, MD, University Professor and director of Columbia’s ICAP; and Roy Brown’56, professor emeritus of population & family health, who has worked in more than 40 coun-

PBS Airs Cancer Documentary Based on Pulitzer Prize-Winning Book

A **three-part**, six-hour documentary series based on a Pulitzer Prize-winning cancer biography written by P&S faculty member Siddhartha Mukherjee, MD, aired on PBS March 30, March 31, and April 1.

The documentary, based on the book “The Emperor of All Maladies: A Biography of Cancer” (Simon & Schuster, 2010), was directed by Columbia journalism alumnus Barak Goodman and executive produced by Ken

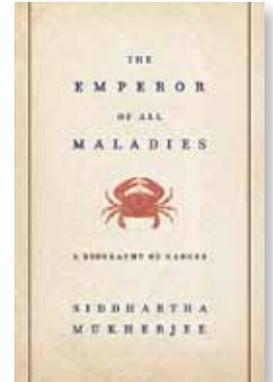
Burns. It was part of a comprehensive national campaign with Stand Up To Cancer and other project supporters.

Dr. Mukherjee is assistant professor of medicine at P&S. The book and documentary tell the story of cancer from its first description in an ancient Egyptian scroll (the Edwin Smith Surgical Papyrus at New York Academy of Medicine) to the gleaming laboratories of modern research institutions. The film combined a sweeping historical narrative, intimate stories about contemporary patients, and an investigation into the latest scientific breakthroughs.

In conjunction with the documentary, Columbia University hosted a panel discussion in Low Library March 24 that featured cancer specialists from Columbia, UCLA, and Johns Hopkins, who briefed the news media on advances in cancer prevention, diagnosis, and treatment. The event is available on YouTube at bit.ly/Columbiacancerdiscussion.

The documentary included interviews with these P&S alumni: Jerome Groopman’76, James Holland’47, David Loeb’94 MD/PhD, and Harold Varmus’66. The film also discussed the work of William Halsted, an 1877 P&S graduate who was on the P&S faculty before moving to Johns Hopkins and developing radical mastectomy as a treatment for breast cancer.

Information about cancer care and research at Columbia is available at www.columbia.edu/cancer. The PBS documentary is available online at www.pbs.org.



Siddhartha Mukherjee and Ken Burns

STEPHANIE BERGER

tries in Asia, Africa, and Latin America and served as an adviser to multiple governments.

Each faculty participant also worked with interested students one-on-one. Along with P&S students, students represented Columbia’s School of Nursing, Mailman School of Public Health, College of Dental Medicine, Institute of Human Nutrition, and School of International and Public Affairs. The 50 students were chosen from among 180 students from the CUMC and Morningside campuses who applied to enroll in the series.

“The magnitude of interest by the students in the course has been electrifying,” says Dr. Nicholas. “Faculty on the planning committee, as well as those who have lectured, have been similarly energized. Global health will, and should, be increasingly a priority for those going into medicine.”

The lecture series was presented by IFAP, the Clyde and Helen Wu Center for Global Health Initiatives, and the Grodman Dual Degree Program. The series has been named for the late Edgar M. Housepian’53, professor emeritus of clinical neurological surgery at P&S who spent his career at Columbia while championing interdisciplinary global health.

He served as special adviser for international affiliations to the P&S dean from 1996 until 2010. He chaired the medical committee of Fund for Armenian Relief, which provides emergency relief and implements long-term programs for the economic growth and social development of Armenia. He helped design a postgraduate medical fellowship program that brought nearly 90 Armenian doctors to the United States for additional training. Before his death in November 2014, Dr. Housepian agreed to lend his name to the series.

The IFAP Global Health Program was founded by Dr. Nicholas in 1999. It supports several programs, including summer internships for medical center students; scholarly projects for medical students; a one-year medical student global health research scholars program; and medical student and resident clinical elective rotations at international sites. The program has sponsored projects in Latin America, the Caribbean, Africa, the Middle East, and Asia on topics that range from post-earthquake health needs assessments in Haiti to an assessment of depression among adolescents with sickle cell disease in Uganda.



AMELIA PANICO

Match 2015

All 149 P&S students participating in Match Day 2015 were matched to a residency, reports Lisa Mellman, MD, senior associate dean for student affairs. The most popular residency is internal medicine (18 percent). Other disciplines the students matched to: orthopedic surgery (8 percent), psychiatry (8 percent), pediatrics (7 percent), emergency medicine (6 percent), ophthalmology (6 percent), urology (5 percent), anesthesiology (4 percent), ob/gyn (4 percent), and otolaryngology (4 percent). More women (82) than men (67) participated in this year's match. About a third of the participants (32 percent) matched in primary care fields (family medicine, internal medicine, pediatrics, and ob/gyn). See more, including a slide show, in the CUMC Newsroom: bit.ly/2015Match

Expansion Plans for Westchester Move Ahead

In keeping with the goals and aspirations of the P&S strategic plan, ColumbiaDoctors has continued its growth, most recently in its expansion into Westchester County.

A primary goal of the "2020 Vision" plan was to expand clinical reach through increased ambulatory capacity and geographic range. ColumbiaDoctors now employs about 1,500 full-time practitioners, up from about 1,200 in 2013. In 2014, the faculty practice grew its roster of primary care physicians and suburban offices with the integration of the Westchester- and Hudson Valley-based North Star Medical Group.

ColumbiaDoctors has made additional inroads to deliver health care to Westchester patients—both close to their homes and at NewYork-Presbyterian/Columbia University Medical Center in Washington Heights. Establishing a Westchester presence is increasingly important as health care systems continue to consolidate and large medical groups gain major stakes in the health care marketplace.

Lawrence Hospital in Bronxville is now part of the NewYork-Presbyterian system and

has been renamed NewYork-Presbyterian/Lawrence Hospital. Going forward, all new specialists serving Lawrence will be ColumbiaDoctors. In January, Hudson Valley Hospital Center in Cortlandt Manor became NewYork-Presbyterian/Hudson Valley Hospital.

ColumbiaDoctors is expanding its presence in Tarrytown with a new multispecialty site with more than 20,000 square feet of space and easy access from major highways on both the east and west. The faculty practice projects an early fall opening for the new facility.

As more community hospitals close or become affiliated with larger institutions, the clinical landscape is changing rapidly in Westchester County, which is taking part in a federally funded, \$10 million health care job-training initiative to help grow the health care sector.

Currently, ColumbiaDoctors has more than 125 full-time faculty physicians in the northern suburbs of Lower Hudson Valley, Rockland County, and Westchester, and the number should continue to grow as alliances with medical groups are considered.

Construction Update: Medical and Graduate Education Building

The Medical and Graduate Education Building under construction at 104 Haven Ave. is on track to open in the summer of 2016. Monthly updates on construction are provided at the building's website, www.educationbldg.cumc.columbia.edu/.

The final beams were placed on top of the building last October, completing the facility's superstructure, and the building's façade installation has continued over recent months.

The 14-story building will tower approximately 223 feet above ground. More than 100 contractors have been working on the building since late summer 2013.

The building will have 100,000 square feet of high-tech classroom facilities; an advanced simulation center; innovative learning spaces for both collaboration and quiet study; a new auditorium and event spaces with integrated technology; and lounges, a café, and a student commons area.

The space is being configured to allow optimal daylight into classroom and public spaces, and the building includes sustainable features that are intended to qualify the building for LEED (Leadership in Energy and Environmental Design) Gold certification. Gold certification means the building has received between 39 and 51 points in six categories: sustainable sites (light pollution reduction, other pollution reduction, and conserving a site's natural elements); water savings; energy and atmosphere; materials and resources; indoor environmental quality; and innovation and design process.





Yanne Doucet

JÖRG MEYER

Columbia Grad Students Create Community for Women in Science

Graduate students who head the Women in Science at Columbia organization are expanding their reach from CUMC and Morningside Heights to the wider metropolitan area by helping to launch New York Women in Science, Technology, Engineering, and Mathematics—NYWiSTEM—a first-of-its-kind organization dedicated to the advancement of women in the sciences.

“We wanted to create a community that provides resources for mentoring, networking, and professional development to actively address some of the challenges of pursuing STEM education and careers,” says NYWiSTEM co-president Yanne Doucet, a PhD student in the Department of Dermatology through a joint program of Columbia University and the Universite Aix-Marseille.

Women in Science at Columbia, the volunteer organization founded by graduate students in 2004, advocates for women in science and also provides graduate students, medical students, postdocs, junior faculty, and technicians with opportunities to acquire leadership and other professional skills through mentoring undergraduates and organizing outreach events for younger students. “It’s important to have us talking to young girls and explaining to them that they, too, can pursue this type of career,” says Ms. Doucet, former president of Women in Science at Columbia.

The Columbia group hosts events such as Girls’ Science Day, which brings young students to Columbia’s laboratories for daylong programs of activities and experiments led by science graduate students and postdoctoral researchers, and it hosts mentoring events for undergraduates.

Graduate students and postdoctoral researchers need mentoring as well, and the group hosts networking events, such as a recent panel discussion on entrepreneurship and tech startups, and provides resources for grant and fellowship applications. The gender balance in the sciences, Ms. Doucet says, “is pretty well balanced until the level of PhD, but then

when people start to go on for tenure positions, it completely drops.” According to the National Science Foundation, women earn about half the doctorates in science and engineering but make up only 21 percent of full science professors and 5 percent of full engineering professors. They also make, on average, 82 percent of what male scientists make.

Every few months, the student group invites a diverse mix of faculty members and principal investigators to discuss their careers. “For the young women who are reaching the point where they’re thinking about having a family and wondering, ‘Can I still be successful? Can I work a lot, and still have a family life?’ you need to have some role models to show you that, yes, you can do it,” says Ms. Doucet.

The desire to broaden the community of women scientists inspired the student leaders to reach out to fellow graduate students and researchers around the city and across numerous fields. New York Women in STEM has drawn members from 37 institutions across academia and industry. “For smaller schools, this provides a community and support that they would not have otherwise, because smaller institutions don’t always have the financial resources for the kind of programs we run,” says Ms. Doucet.

At its first large networking event in October, New York Women in STEM hosted 20 speakers from the fields of academia, industry, consulting, policy, and tech transfer, who held small roundtable talks for some 150 graduate students and postdoctoral researchers in attendance, followed by a reception. “The PhD students and postdocs really felt that they got something out of these discussions,” says Ms. Doucet.

More information about New York Women in Science, Technology, Engineering, and Mathematics is available at the group’s website, NYWiSTEM.wordpress.com.

News in Brief

Riccardo Dalla-Favera, MD, and **Rodney Rothstein, PhD**, were elected this spring to the National Academy of Sciences in recognition of their distinguished and continuing achievements in original research. Dr. Dalla-Favera is the Joanne and Percy Uris Professor of Clinical Medicine, professor of pathology & cell biology, genetics & development, and



Riccardo Dalla-Favera, MD,
and Rodney Rothstein, PhD

microbiology & immunology, and director of the Institute for Cancer Genetics. He has been an international leader in the field of lymphoid neoplasia for the past 30 years. Dr. Rothstein is professor of genetics & development and has a joint appointment in the Department of Systems Biology. He has pioneered the use of recombination to alter genomes and has used these methods to isolate novel genes involved in the maintenance of genome stability.

Four P&S faculty members have been named Fellows of the American Association for the Advancement of Science: **Oliver Hobert, PhD**, professor of biochemistry & molecular biophysics, elected to the section on biological sciences; **Gordana Vunjak-Novakovic, PhD**, the Mikati Foundation Professor of Biomedical Engineering and professor of medical sciences (in medicine), section on engineering; **Charles Zuker, PhD**, professor of biochemistry & molecular biophysics and of neuroscience, section on neuroscience; and

George D. Yancopoulos, MD, PhD, adjunct professor of microbiology & immunology, section on neuroscience.

More than 100 members of the medical center community stopped by the new **Barnes & Noble campus store** in November to celebrate its grand opening, which featured live music, book readings, refreshments, and remarks. The event kicked off with selections from “The Music Man,” a musical by Meredith Wilson, performed by the Bard Hall Players. The store relocated to a larger space at Haven Avenue and 169th Street, in the lower level of the Hammer Health Sciences Center. The new site carries academic course material and supplies plus a small selection of general-interest books and periodicals. A café has both indoor and outdoor seating.

Frank R. Smith ’62 donated an early 19th century surgical kit to Archives & Special Collections at the Augustus C. Long Health Sciences Library at Columbia University Medical Center. The kit was a gift from John Anthon to Dr. Smith’s ancestor, Dr. David Hosack, in recognition of Dr. Hosack’s medical services “cheerfully & attentively rendered” to Mr. Anthon’s parents. David Hosack (1769-1835) was an eminent early 19th century American physician, scientist, and educator who served at various times as professor of botany, materia medica, medicine, and physiology at



P&S. John Anthon (1784–1863) was a noted New York City lawyer and jurist who was the author of several volumes of legal case reports and a founder of the New York Law Institute.

Ben-Gurion University of the Negev’s Faculty of Health Sciences and P&S have renewed their affiliation for five years. P&S supports and advises Ben-Gurion University’s Medical School for International Health, which offers its students specialized training in global health.

Serge E. Przedborski, MD, PhD, an internationally recognized clinician-scientist in the neurobiology of disease, has been appointed



Serge E. Przedborski, MD, PhD

the inaugural director of the Columbia Translational Neuroscience Initiative. His work on the cellular and molecular mechanisms of neurodegeneration in Parkinson’s disease and amyotrophic lateral sclerosis exemplifies the potential of interdisciplinary, basic, and translational science to result in meaningful advances in the diagnosis, prevention, and treatment of neurologic disease. The center was established to integrate and coordinate Columbia’s research efforts related to the neurobiology of disease. With other initiatives at Columbia, including the Mortimer B. Zuckerman Mind Brain Behavior Institute and the new Institute for Genomic Medicine, the center will be part of a comprehensive, universitywide neuroscience enterprise.

3-D Printing of Baby's Heart Guides Surgery

Columbia's pediatric surgeons are now using 3-D printed models of patients' hearts to guide surgery in children born with complex heart disease. The first model was used last October to treat a newborn with a rare and complex form of congenital heart disease, giving the surgeons an unrivalled understanding of the child's defects and how to repair them in one operation.

"The baby's heart had lots of holes, not uncommon with congenital disease, but the

heart chambers were also in an unusual formation, like a maze," says Emile Bacha, MD, the Calvin F. Barber Professor of Surgery at P&S and director of congenital and pediatric cardiac surgery at New York-Presbyterian/Morgan Stanley Children's Hospital, where the surgery was performed.

"In the past, we had to stop the heart and look inside to decide what to do. But we only have a limited amount of time to perform the surgery," he says. "With 3-D printing technology, we are able to look at the inside of the heart in advance, giving us a road map for the surgery."

The first patient was just 1 week old when surgery was performed and had a heart the size of a walnut. With the aid of the 3-D model, printed to scale, the team was able to repair all of the heart's defects in a single procedure. Typically, babies born with complex defects require three or four life-threatening surgeries.

Before the surgery, a team of doctors led by Anjali Chelliah, MD, assistant professor of pediatrics, diagnosed the baby with congenital heart disease while he was still in the womb, allowing time to develop the optimal treatment plan. One day after the baby was born, a low-dose CT scan and an echocardiogram provided excellent images, but given the size of the heart and the complexity of the defects, it was still difficult for the surgeons to see how the defects could be repaired.

Dr. Chelliah and pediatric cardiology fellow Hannah Fraint, MD, sent the CT imaging data to Materialise, a company that specializes in 3-D printing for health care, to create a model of the child's heart. After seeing the model, the surgeons requested a different model cut at a different angle to gain even more understanding. They then devised a plan to fix all the defects in one seven-hour operation instead of three separate ones.



JORG MEYER

The patient is expected to not only have a normal lifespan, but also will probably not require any additional cardiac surgical interventions.

Dr. Bacha and Dr. Chelliah are optimistic that 3-D printing technology will continue to improve outcomes for patients. Since their first cases, they have printed 3-D model hearts of two preschool-age children; surgeries for both patients are being planned.

The physicians also are collecting the 3-D models in a library to help surgeons and cardiologists in training. “It’s clear that 3-D models can be successfully used to help surgeons in complex procedures,” says Dr. Bacha. “This technology is the future, and we are proud to help lead the way.”

The models used in this case were provided with the help of Matthew’s Hearts of Hope, a nonprofit organization, and a grant from the organization to Dr. Fraint.



Emile Bacha, MD, Anjali Chelliah, MD, and Hannah Fraint, MD

JORG MEYER

Miniature Microscopes Improve GI Diagnosis, Treatment

Confocal microscopy—a high-definition imaging technology common in the lab—has now been miniaturized and is being used by Columbia physicians to see the GI tract in a way never before possible.

“Physicians began using the technology in clinical decision-making about two years ago, and it’s been a significant advance in our abil-

ity to diagnose gastrointestinal conditions,” says Frank Gress, MD, professor of medicine and clinical chief of digestive diseases at NewYork-Presbyterian/Columbia University Medical Center.

For decades, confocal microscopes have allowed scientists to obtain finely detailed and highly magnified images of biological tissues, but the equipment was bulky and restricted to the lab bench. Technological advances have now shrunk these microscopes down to several millimeters in diameter so they are suitable for clinical purposes. A miniaturized confocal microscope can be attached to a catheter and passed through the entire gastrointestinal tract and can also be used in the bile and pancreatic ducts.

Unlike an endoscopy procedure, the miniature microscope makes it possible for physicians to see underneath the surface of the tissue and inspect the microcellular structure of the GI tract.

The miniaturized technology is called probe-based confocal laser endomicroscopy (pCLE) and is produced by Mauna Kea Technologies under the name Cellvizio.

“Cellvizio allows us to do an optical biopsy and make a decision on the spot about an abnormal finding,” Dr. Gress says. “In the days before pCLE, we would image with our endoscope, take a biopsy, and then wait several days for the results. Now, we can go from evaluation to biopsy to interpretation in one session.”

Barrett’s esophagus is a condition that is strongly suited to the use of pCLE. “pCLE

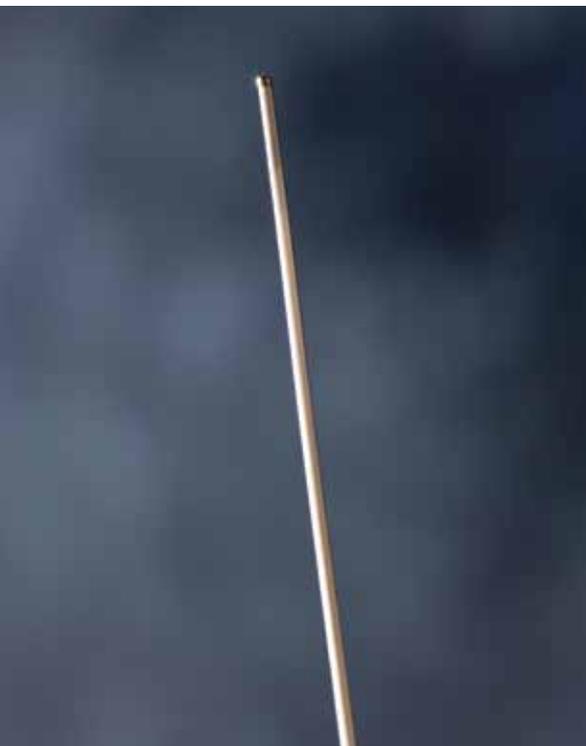
has the potential to detect more malignant or premalignant lesions through better sampling, especially in areas that appear normal under endoscopic examination.” In some cases, physicians have been able to perform minimally invasive treatments for conditions that traditionally required major surgery.

The technology also helps when using an endoscope to remove a lesion. “We can use pCLE to better define what we’re going to remove and also confirm that we’ve removed all of it,” says Dr. Gress.

pCLE also may help patients with chronic pancreatitis, pancreatic cysts, pancreatic and bile duct strictures and people with a family history of pancreatic cancer. In the case of pancreatic cysts, the technology is changing how patients are monitored for potential malignancies.

“We can put the confocal microscope into the pancreatic cyst and determine if a cyst is benign or potentially malignant just by looking at it,” says Dr. Gress. “Before, we had to extract fluid and biopsy samples and wait several weeks for all the results to come back. Presently, we are still taking tissue biopsies at this time to validate our pCLE findings, but in the future, we hope that current ongoing clinical trials will support making the determination without the physical biopsy.”

For more information, contact Dr. Gress at 212-305-1909.



JORG MEYER

A New Place for Family Eye Care By Joseph Neighbor

As the population of young families living on the Upper West Side of Manhattan has grown, so has the demand for local family- and child-centered eye care.

The Robert Burch Family Eye Center opened last year to address this need. Located at 15 W. 65th St. near Lincoln Center and Columbus Circle, the Burch Family Eye Center offers comprehensive primary and subspecialty vision care with a focus on pediatrics. Its amenities include a state-of-the-art diagnostic suite, five exam rooms, and two waiting rooms, one of which is reserved for children and families.

The center is ColumbiaDoctors Ophthalmology's third and newest site, joining the Gloria

and Louis Flanzer Vision Care Center on the East Side and the Edward S. Harkness Eye Institute in Washington Heights.

The Burch Center is a significant and necessary expansion of Columbia's pediatric services. "Many people aren't aware that pediatric ophthalmology is a service that we provide at Columbia because it's been so low-profile," says Steven E. Brooks, MD, chief of pediatric ophthalmology and professor of ophthalmology (in pediatrics) at CUMC. "We're trying very hard to make our services accessible, something that is particularly important for busy parents." Lauren Yeager, MD, another board-certified, fellowship-trained pediatric ophthalmologist on

the faculty at Columbia, will also see patients at the Burch Center.

Though the Burch Center focuses on primary vision care, its close relationships with other departments at Columbia and the Harkness Eye Institute allow it to co-manage children with rare conditions, such as pediatric tumors, glaucoma, cataracts, or retinal disease. Specialists in pediatric endocrinology, genetics, neurology, and rheumatology—whose specialties overlap with many ocular syndromes—are all available for collaboration at Columbia.

The Burch Center also works closely with Lighthouse Guild International, a nonprofit devoted to helping blind or vision-impaired children, especially those with multiple disabilities. The Burch Center and the Lighthouse Guild share space at 15 W. 65th St., where the Lighthouse Guild provides low-vision rehabilitation, mental health counseling, and educational programs. It is just the newest form of a long collaboration. First-year ophthalmology residents spend several days at the Lighthouse Guild as part of their training in low vision.

As part of a major academic institution, research into pediatric eye diseases is a major component that Dr. Brooks would like to grow and develop. The division participates in an NIH-funded study looking for genes involved in retinopathy of prematurity, the leading cause of blindness in infancy.

As the division grows, the Burch Center will play an increasingly important role in providing children access to ColumbiaDoctors pediatric ophthalmologists.

Pediatric ophthalmologists are in short supply in Manhattan and throughout the nation, a problem Dr. Brooks wants to address with the creation of a pediatric ophthalmology fellowship. "Pediatric ophthalmology is a specialty that is in great demand, and Columbia should provide an outstanding place for training the next generation of specialists," says Dr. Brooks.

The Burch Center can be contacted at 212-342-2870. Appointments may be scheduled by calling 212-305-9535. More information about ophthalmology at Columbia or the Harkness Eye Institute: www.columbiaeye.org



Steven E. Brooks, MD

JORG MEYER

FROM THE TONGUE TO THE BRAIN

A Body of Research by
Charles Zuker Explains How
We Distinguish Bitter from
Sweet, Salty from Sour—and
Why We Should Care

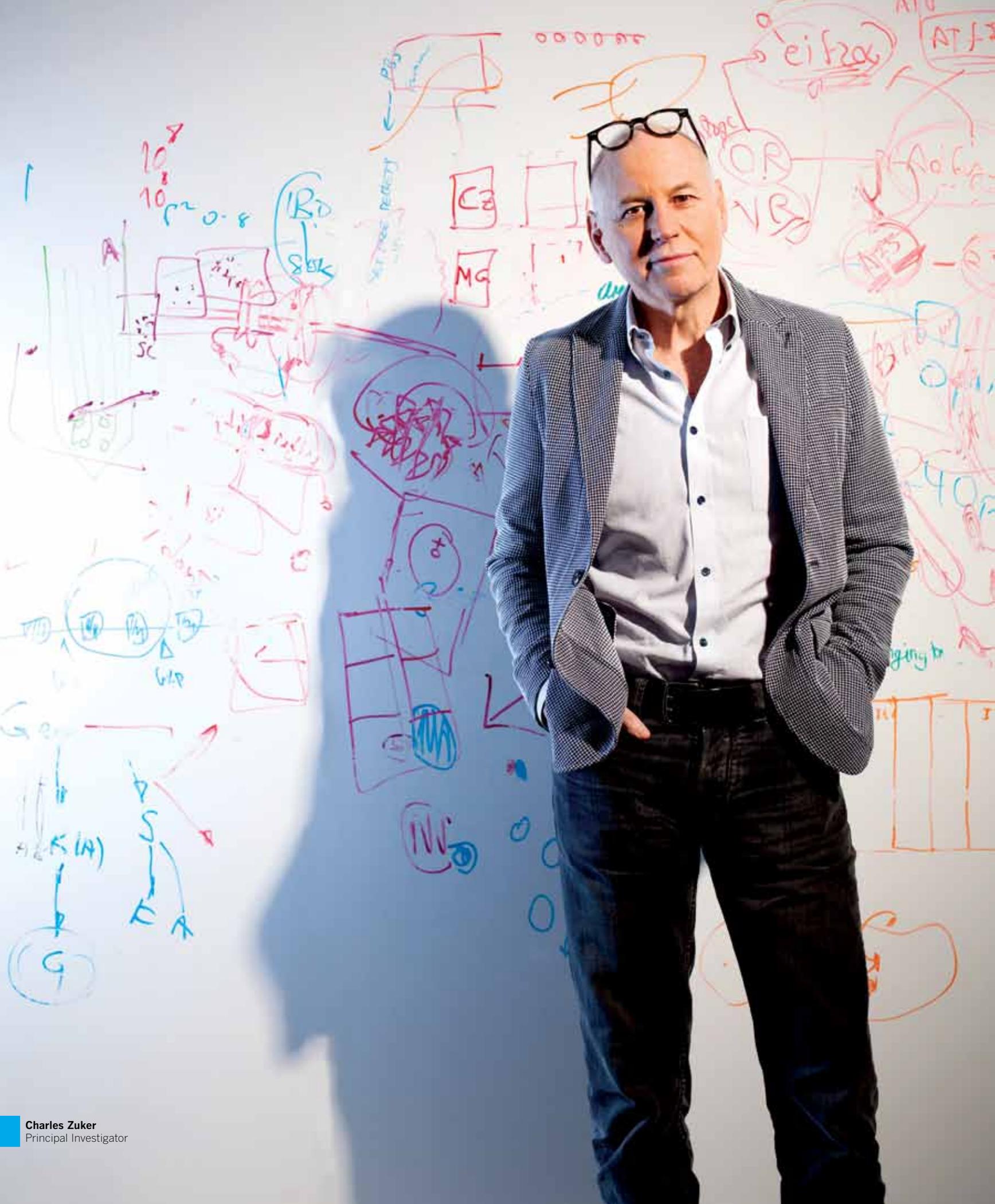
Survival might not be top of mind when you are feasting on a filet mignon in butter sauce on a night out, but the taste receptors sparked into action with each bite are, evolutionarily speaking, what draws you to foods that keep you nourished. Similarly, the revulsion you feel from a bite of anything too bitter, sour, or salty is what keeps you from ingesting a poisonous substance that could kill you.

Taste has two purposes, proposed the gastronome Jean Anthelme Brillat-Savrin in his 1826 treatise, “The Physiology of Taste.” “It invites us, by arousing our pleasure, to repair the constant losses which we suffer through our physical existence,” he writes, and “it helps us to choose from the variety of substances which Nature presents to us those that are best adapted to nourish us.” And yet, despite how clear are our experiences of taste, he notes, “It is not easy to determine precisely what parts make up the organ of taste. It is more complicated than it seems.”

Scientists who have studied the question in the nearly two centuries since then would undoubtedly agree with this assessment. Taste was the last of the five senses to give up the broad brushstrokes of its molecular secrets. In the past 15 years or so, a coherent picture of taste perception has emerged,

By [Alla Katsnelson](#)





Charles Zuker
Principal Investigator

in large part through the work of Charles Zuker, PhD, professor of biochemistry & molecular biophysics and of neuroscience at P&S since 2009. During that time, Dr. Zuker and his colleagues elucidated the basic organization of taste perception in the tongue, pinning down one by one the identity of all five types of taste receptors and cells: sweet, bitter, sour, salty, and umami. More recently, they also established the basics of how signals transmitted through these receptors are interpreted in the brain.

“Zuker’s work really provided the most significant insight and knowledge about the sense of taste,” says Richard Axel, MD, University Professor and co-recipient of the 2004 Nobel Prize in Physiology or Medicine for his work identifying the genes that encode olfactory receptors. “The thing about Charles is that he does science with real creativity and courage. He goes in and breaks open a difficult problem.”

Dr. Zuker began his career in the mid-1980s investigating the molecular signaling pathway between the retina and the brain in flies, but in the late 1990s he set his scope on taste, where it has remained ever since. The choice of sensory system really doesn’t matter, he says; the greater goal is to figure out how the brain translates sensory cues it receives from the external world into meaningful signals that make an organism tick. “The beauty about taste is that it has limited chemical space. There are only five basic qualities and each of them has an innate and very well-defined meaning and valence,” he says. “So the taste system provides a powerful platform to understand how the brain functions: how complex, hard-wired circuits operate, how they are modulated, and how they are used to guide actions and behaviors.”

Finding the Right Experiment

When he speaks about his work—hands gesturing expansively to punctuate descriptions of experiences and experiments, glasses perched atop his head—Dr. Zuker exudes intensity as well as a kind of laser-like clarity and devotion to logic. He seems guided by the idea that the world breaks down into propositions that will stand or fall on the outcome of an experiment—as long as you can find the right one. It is a mindset that he adopted early in life: He has been pretty much committed to uncovering the secrets of the natural world since receiving a microscope as a gift from his parents when he was 7 or 8 years old.

After studying biology in college in his native Chile, Charles Zuker headed to the Massachusetts Institute of Technology for graduate school at the age of 19. He soon found his way to the lab of cellular and developmental biologist Harvey Lodish, who was studying gene regulation and differentiation of the cellular slime mold *Dictyostelium discoideum*. Dr. Zuker’s flair as a researcher was unforgettable, says Dr. Lodish. “He did quite an exceptional piece of work in my lab. It was some of the first cloning of developmentally regulated genes in the organism. He was brilliant, brash, arrogant, very talented, very productive.” At one point, Dr. Zuker declared his research completed and assembled a thesis committee to evaluate him; it turned out, however, that committee members disagreed and he returned to the bench for another year of experiments. The hiccup changed the course of his future work. During that year, Dr. Zuker’s plans to pursue a postdoc in a high profile European cloning lab crumbled and his interest in studying the neurobiology of complex organisms crystallized.

In 1983 he joined the lab of one of Dr. Lodish’s earlier mentees, Gerald Rubin, at the University of California, Berkeley.

At the time, researchers were just beginning to develop the tools to probe the nervous system at the level of molecular biology, and Dr. Rubin (now executive director of the Howard Hughes Medical Institute’s Janelia Research Campus) was at the forefront of this effort. The previous year, the Rubin lab had invented a method to alter the fly genome by inserting bits of DNA into specified locations, allowing researchers to probe the function of genes by mutating them. “This was a transforming, disruptive technology that changed what you could do with flies, because now, for the first time, you could examine causality by manipulating it,” Dr. Zuker says. In the four years he spent in Dr. Rubin’s lab, he helped identify the fly genes encoding different forms of rhodopsin, a light-sensitive protein in the retina whose activation kicks off photoreception, and probed the genes’ function by mutating and manipulating them in living flies.

A Surprising Turn to Taste Research

In 1987 Dr. Zuker started his own lab at the University of California, San Diego, where he went on to dissect the phototransduction pathway in flies, using genetics and physiology to uncover the underlying signaling mechanisms and using it as an entry point to understand how G-protein coupled receptors (GPCRs) can transform a photon of light into a signal

that activates a photoreceptor neuron. With this focus on signal transduction in the visual system, the lab’s foray into taste was something of a fluke. It began with a commentary that Dr. Zuker was asked to write in 1995 for a paper published in *Nature* on GPCR signaling in taste transduction. Very little was known about the molecular mechanism underlying taste and, despite decades of searching, researchers had never been able to identify taste receptors. The more Dr. Zuker read about the field, the more perplexed he became. “I realized that the fundamental premises that were at the time the de facto understanding of how taste operated made no sense,” he says.

“I realized that the fundamental premises that were at the time the de facto understanding of how taste operated made no sense.”

For one thing, the widely held view was that taste receptor cells were broadly tuned for the five known taste qualities and that the brain would later deconvolute this complex signal. “We figured that it’s inconceivable that you would mediate something as fundamental to life and death by using a system that relies on broadly tuned sensors,” he explains. Another thing that bugged him was that researchers had proposed a mishmash of different types of receptor signaling systems for mediating different taste qualities. “The nature of the receptors that had been proposed was not consistent with what we knew about sensory receptors.”

His lab had always included a few researchers whose work lies outside of the group’s core interests, so he set a new postdoc to work on the topic.

Alexander Sisti
Graduate Student



BITTER

Lindsey Macpherson
Associate Research Scientist



SALTY

Columbia Medicine asked members of Dr. Zuker's lab to pose for pictures that illustrate the tastes for which Dr. Zuker and his colleagues have identified receptors and cells.

He also struck up a partnership with Nicholas Ryba, a geneticist studying taste and smell at the National Institute of Dental and Craniofacial Research. Dr. Ryba similarly smelled something fishy in the taste field's status quo. The two teams began a concerted search for taste receptors by screening RNA sequences in taste buds from the rodent tongue, and in 1999 they reported the identification of two novel GPCRs, T1R1 and T1R2, that seemed to fit the bill.

But it took a larger resource—specifically, the draft sequence of the human genome, which was published the following year—for their efforts to really hit pay dirt. Earlier genetic studies had pinpointed a gene on chromosome 5 that was associated with the ability to taste a bitter substance called 6-n-propyl-2-thiouracil, or PROP, so the duo combed the draft sequence for orphan GPCRs and identified an entire family of bitter-sensing GPCRs. These so-called T2R receptors were present in varying combinations in one type of taste receptor cell, and the combination would determine a person's sensitivity to bitter taste.

The work, published in June 2000 as a pair of studies in the journal *Cell*, was one of the first discoveries to be made by mining the human genome. It also spurred a race among taste researchers in the search for other types of receptors. The following year, Drs. Zuker and Ryba identified a third T1R, T1R3, and explained the role this family of receptors plays in taste. These receptors' pairing in a cell determined its function, it turned out: T1R2 and T1R3 combined for detecting sweet, while T1R1 and T1R3 together sensed umami, a savory taste that in humans is elicited by the amino acid glutamate. The findings stacked up to build a picture of different taste qualities encoded by distinct receptors expressed on dedicated cells. "At the time, these things were such exciting discoveries; they ran so counter to the dogma," says Dr. Ryba.

Studying taste receptors soon went from being a side project to the primary interest of Dr. Zuker's lab. Progress was steady, as a regular

stream of high-profile papers published exclusively in *Cell*, *Nature*, and *Science* attest. In addition to finding sweet, bitter, and umami receptors, the Zuker and Ryba teams found the receptors and taste cells activated by sour and salty stimuli as well as the sensor for carbonation. To define how each receptor system worked, they knocked out the gene for all the receptor types in mice, thereby selectively abolishing the ability of the mutant animals to perceive the corresponding taste. "The fact that other tastes remain unaffected shows something very important about taste coding," says Dr. Zuker. "It shows that each taste is mediated by receptors and pathways independent of every other." Conversely, they could expand the animals' taste repertoire by introducing receptors that are usually absent. For example, mice are insensitive to many artificial sweeteners, including aspartame. "So we cloned the human receptors and we did the obvious experiment, inserting that human receptor into mice. And indeed, we completely humanized their sweet taste responses."

A Switch to Mouse Genetics

Perhaps the biggest challenge early on, Dr. Zuker says, was the patience required in switching from fly to mouse genetics. As molecular biology techniques, such as the ability to knock out specific genes in the mouse, continued to advance, working in mammalian systems was the obvious choice. However, if you want to tweak the genome of a fruitfly, you can have a mutant line up and running within a few months. Engineering a mouse from the beginning, on the other hand, could take more than a year. The researchers also had to devise a whole set of behavioral paradigms to test the animals' responses. And of course, they encountered the occasional conceptual blind alleys. "For the longest time, for example, we believed there must be a sixth category of taste receptor cells that would respond to high salt," says Dr. Ryba, since this taste is strongly aversive. In 2013 they discovered that this taste quality is encoded differently:

Norman Ding
Postdoctoral Research Scientist



SWEET

Zvi Hershel Fishman
Graduate Student



UMAMI

Hojoon Lee
Associate Research Scientist



SOUR

Rather than having a separate set of receptors, salt at high concentrations causes aversion by activating bitter and sour receptors.

The most difficult scientific frontier, however, turned out to be connecting how these signals from the periphery were processed in the brain. “From the get-go, the goal was to use the receptors to follow the signal and ultimately understand how the brain knows what the tongue

knows—how the brain represents the world,” says Dr. Zuker. Different taste qualities are reliably distinct, he and Dr. Ryba reasoned, so their representation in the cerebral cortex must be as well. But tracing taste receptor neurons that project to the brain turned out to be technically tough, and the key brain area could not be accessed without some extra finagling. It took until 2011 to get the first snapshot of taste representation in the brain, but the results were worth the wait: All the taste qualities segregated into their own, distinct region of the taste cortex in mice, forming a gustatory map. The fact that this delineation was so clear “was a

complete surprise,” says Dr. Ryba, “but it makes a lot of sense.” It allows each type of taste receptor to be wired independently, perhaps stemming from evolutionary developments of different tastes. In a more recent study, published last November, Robert Barretto, a postdoc in Dr. Zuker’s lab, showed that neurons relaying the signal from taste receptors to the brain are also tuned to a single taste quality, suggesting that information

from the tongue essentially travels along dedicated, labeled lines all the way to the brain.

Dr. Zuker’s lab research jives closely with a small core of other molecular neuroscience labs throughout Columbia that investigate the molecular dimension of sensory systems. For example, Richard Axel, who laid the original groundwork for understanding how the brain interprets smell by identifying olfactory receptors, currently studies how complex organisms develop learned responses to odors and how learning and experience give these odors meaning. “Sort of like the smell of madeleines for Proust summon forth his childhood,” Dr. Axel says. The work of Tom Maniatis, chair of biochemistry & molecular biophysics, on proteins called protocadherins, which play an important role in determining neural circuitry, overlaps with both Dr. Zuker’s and Dr. Axel’s work. “We all see each other every day and talk about our science,” Dr. Maniatis says. Another scientist working on the sense of smell, Stavros Lomvardas, PhD, brought his lab to Columbia from the University of California, San Francisco, in September. While Dr. Zuker and Dr. Axel focus on how the brain interprets taste and smell, Dr. Lomvardas, who did his PhD and postdoc training at Columbia, studies the process by which olfactory neurons at the periphery manage to express any one particular smell receptor out of the enormous diversity of those encoded in the genome.

Further exploring how information from taste receptors in the tongue is interpreted and organized by the brain continues to be the main project of Dr. Zuker’s lab. The lab also has begun to explore the interplay between taste and other senses and higher order cognition like learning and memory. “The brain is this chunk of tissue that is made out of a hundred billion neurons that transforms the human condition. It changes fear into courage, sadness into happiness, conformity into creativity,” says Dr. Zuker. “What is the substrate for creativity in the brain? I don’t know. But studying the senses gives us a magical window into the workings of the brain.” ❖

Recent research suggests that information from the tongue essentially travels along dedicated, labeled lines all the way to the brain.



MIND IN MOTION

What, exactly, happens in the milliseconds before you reach for that glass of water on a hot summer's day? Firing in concert, the millions of neurons inside your motor cortex somehow mobilize the muscles of your shoulder, chest, arm, and fingers as you reach for the glass, grasp it, and lift it to your lips. But how, specifically, do those electrical impulses coordinate and control movement?

Most of us grab a drink without thinking, neither crushing the vessel nor dropping it, neither pouring its contents down our shirtfronts, nor inadvertently tossing the cup over our heads. And yet computer scientists are unable to program a robot to execute this task with the same level of smoothness and effortlessness. Nor are doctors or engineers yet able to offer prosthetics that come close to the flexibility and precision of a lost limb.

For more than a decade, P&S assistant professor of neuroscience Mark Churchland, PhD, has been recording neural and muscular activity in the laboratory, seeking to both explain and predict how the activity of neurons in the motor cortex relates to movement. This goal has long been central to the study of the brain. It is of increasing relevance to human health as the development of neural prosthetics for paralyzed patients has shifted from science fiction to reality over the past two decades. "Think of the motor cortex as a very fancy machine for generating patterns of activity," says Dr. Churchland, who also co-directs Columbia's Grossman Center for the Statistics of the Mind. "We're trying to reverse engineer that machine."

Dr. Churchland embarked on that reverse engineering project in 2004, as a postdoctoral fellow at Stanford. His earlier graduate work at UCSF focused on the primary visual cortex, where the activity of individual neurons corresponds directly and neatly to cues such as motion, color, and form. "Much of that field was created by men and women who were engineers," says Dr. Churchland. "They had a very mechanistic perspective and they really did manage to explain things very concretely, and in very satisfying ways."

Given the early successes of visual neuroscience, it was natural for the same ideas to be applied to the motor cortex. If a single neuron in the primary visual cortex encodes for red and another for green, scientists hypothesized, then perhaps a single neuron in the motor cortex might encode a rightwards reach, and another a leftwards reach. Yet as the accumulating experimental data on neural activity and physical movement became ever more nuanced and detailed, it became increasingly difficult to reconcile facts with theory. "When I moved to the study of the

motor cortex," recalls Dr. Churchland, "I definitely found a lot of the explanations—and even the styles of explanations—not very satisfying."

Perhaps worse, it seemed like the data that Dr. Churchland was collecting in his own studies more closely approximated an experimental train wreck. The responses of the neurons seemed so complex that the experiments and analyses he had originally expected to perform were clearly inappropriate. "Recording neural activity is like a little ritual," he says. "You glean a view of every nuance of a neuron's activity. As I started looking at the motor cortex neurons, I actually thought maybe we weren't recording in the right area because it didn't look like it was supposed to look."

Dr. Churchland was by no means the first to express dismay at the discrepancy between his motor cortex data and what prevailing theories might predict. Researchers started recording and describing the activity of individual neurons in the motor cortex in the late 60s—and they have been debating ever since how to interpret the reams of data that work has generated. "It has become increasingly clear that the accumulating experimental evidence undermines many of our simplistic notions about neural coding," wrote University of Washington neuroscientist Eberhard Fetz, PhD, in a 1992 literature review for *Behavioral and Brain Sciences*. "Moreover, the search for neural correlates of motor parameters may actually distract us from recognizing the operation of radically different neural mechanisms of sensorimotor control." In short, Dr. Fetz was arguing that it was, in fact, fine if no individual neuron was a "rightwards reach" neuron. Often the parts of a machine make little sense in isolation; why should the neural machine of the motor cortex be any different?

The more Dr. Churchland looked at the data, the more enamored he became with the view first proposed by Dr. Fetz, which had also been

To Make Sense
of How the
Brain Controls
Movement,
Neuroscientist
Mark Churchland
Had to Toss Out
Existing Theories
and Listen to
His Data

BY SHARON TREGASKIS

adopted by some of his other colleagues. Increasingly, he had a hunch that nothing short of a theoretical overhaul—Dr. Fetzi’s “radically different” approach—would be required to make sense of it all. “Getting from dissatisfaction to satisfaction was a seven-year journey,” he says. “It was a long time where we had to be OK with the fact that the data were fascinating and interesting, but it wasn’t clear what they meant.”

At the time, self-described “data geek” John Cunningham, PhD, was a PhD student in the same Stanford lab as Dr. Churchland. Both were captivated by the opportunity to make sense of that fascinating and interesting data. “The brain is the biggest mystery in our universe right now,” says Dr. Cunningham, now an assistant professor of statistics at Columbia and a collaborator with Dr. Churchland in the Grossman Center. “We know how to fix many bones and organs, know about deep space fea-

tures we haven’t seen, but we haven’t yet figured out how your brain controls your arm to pick up a glass of water.”

Dr. Churchland and Dr. Cunningham have focused much of their investigation on the milliseconds of neural activity that precedes a voluntary movement. Imagine an orchestra, in the moment before the first note is struck: The conductor raises her baton and the musicians ready their instruments. This is the preparatory phase. When the baton drops, the symphony commences—action. In the motor cortex, other scientists had hypothesized that within each motor neuron, the milliseconds preceding action featured a crescendo of electrical activity. Once enough neurons reach their threshold, motion begins. Dr. Churchland, Dr. Cunningham, and their Stanford colleagues speculated that by monitoring the activity of a single neuron, scientists had focused too narrowly in their search for

MONKEYS AND THEIR BILLIE JEAN TASK

ON THE VIDEO MONITOR, trees, brick walls, and other features of an animated landscape whiz by. A whimsical little dragon is barely visible on a hilltop in the distance. In the foreground of that virtual world, a square target appears. Standing in for a soundtrack, a white noise machine supplies the cacophony of the rainforest. Suddenly the target glows and on cue, Drake turns the hand crank to his right, progressing through the three-dimensional tableau on the monitor.

Like his companion, Cousteau, Drake works for Tang, dispensed from a contraption similar to a hamster’s hanging water bottle. Through a straw in easy reach, the players get one sip for reaching the first target, seven sips on reaching the second.

Drake and Cousteau are specially trained 7-year-old rhesus monkeys fitted with an implant smaller than a penny that records their neural activity as they alternately crank toward the glowing target or pause, awaiting their next cue. They have logged months of training and they take their work seriously. “It’s really very challenging,” says second-year PhD student Abigail Russo, who leads the team performing these experiments in the lab of neuroscientist Mark Churchland.

“It is a hard task if you haven’t practiced,” says Ms. Russo, who tried the task herself, with limited success, when she was training to work with the monkeys. On a typical day, Drake and Cousteau log hundreds of trials in the span of an hour or two. “They are experts: They only fail a trial—and miss out on a reward—if they get distracted or if they just aren’t in the mood to play the game.”

To avert that hazard, Ms. Russo pays close attention to the monkeys’ cues. “Sometimes they’re really in the mood for it and sometimes not,” she says. “It’s like having a coworker. They have ups and downs, so you have to work around their moods and inclinations.” To reward their participation or coax greater enthusiasm on a down day—monkeys and researchers alike have the lowest motivation on Monday mornings—she doles out snacks.

“It’s part of building the relationship with the monkey,” says Ms. Russo, who freely dispenses dried strawberries, bananas, and mangoes, among other favored treats. “You want it to be a very positive experience when they come to the lab.”

“The first thing most people ask me when they find out I work with monkeys is: Do they really like bananas?” says Dr. Churchland. “Indeed, they do, though they also like grapes, apples, figs, and pretty much anything fruit, nut, or vegetable that you or I would like.”

The game created by Dr. Churchland and colleagues is known around the lab as the “Billie Jean” task—a reference to Michael Jackson’s 1982 music video, with light-up sidewalk panels evocative of the targets that cue the monkeys’ virtual trek. The game provides the scientists opportunities to observe how neural activity varies as the monkey cranks forward (when the landscape features green grass) and backward (when it’s brown) and how rhythms of neural activity ebb and flow as the monkey awaits the glowing cue that it may commence turning the hand



crank that propels it through the landscape. “We now know that movement generation depends upon the onset of dynamics that lawfully transform an initial ‘preparatory neural state’ into the pattern of activity that drives movement,” says Dr. Churchland. “Yet a fundamental question remains: What is the nature of the neural trigger signal that recruits those dynamics and in doing so causes movement?”

cause and effect—as though reading the score for the canon in Tchaikovsky’s “1812 Overture” could reveal the orchestral complexity of which it is a part. Rather, they hypothesized in a 2010 paper for the journal *Neuron* that the pattern of activity within a single neuron in the milliseconds before we move is merely the “first cog in a dynamical machine.” “Our results,” they wrote, “suggest that preparatory activity may not represent specific factors and may instead play a more mechanistic role.”

Dr. Churchland had been at P&S only a few months when, in June 2012, *Nature* published a follow-up work—again with Dr. Cunningham and their collaborators at Stanford—elucidating that dynamical machine. In “Neural Population Dynamics During Reaching,” Dr. Churchland and Dr. Cunningham focused on groups of neurons behaving something like two children on a seesaw at the playground. Differences in the phase and amplitude of oscillations among those pairs produce a rhythmic pattern that drives movement. “Think of the motor cortex as a machine for generating patterns of activity,” says Dr. Churchland. “If you want to make a movement, what your brain produces isn’t that movement, but a pattern of activity in the muscles. To get the right movement, the brain has to generate the right pattern of muscle activity.”

This mechanistic view implied, as Dr. Fetz and others had suggested, that it was perfectly acceptable if individual neurons made little sense on their own. “This was not a radical idea at a conceptual level,” says Dr. Churchland, “but in practice it changes almost everything about how one should analyze neural data. The fundamental unit of data in our field is the response of one neuron, which naturally creates the temptation to try and understand each neuron on its own.” By analogy, neuroscientists had attended closely to individual, easily quantified elements of the machine—the odometer, the steering wheel, the pistons—hoping that each would behave sensibly. “But if you saw a piston or a spark plug by itself, would you be able to explain the series of movements that a car makes?” asks Dr. Cunningham. “Motor cortex neurons are like that, too, understandable only in the context of the whole.”

In the wake of the *Nature* paper, Dr. Churchland received several honors, including an NIH Director’s New Innovator Award. More much-needed research funding arrived from key foundations, including Kavli, Simons, Sloan, Searle, McKnight, and Burroughs Wellcome. That October, he was named co-founding director of the Grossman Center, charged with furthering our understanding of the brain by applying quantitative methods to uncover deep and meaningful structure in large neural datasets. Dr. Cunningham also received awards and funding from the Simons and Sloan foundations.

Using their own data, as well as observations collected by other laboratories, Dr. Churchland and his team continue to explore the extent to which their dynamical model corresponds to actual measurements, fleshing out their theory as they go. “If you record the activity of a piston, it’s hard to relate that to the straight-line movement of a car,” says Dr. Churchland. “Any engine has moving parts that don’t directly relate to the vehicle’s final movement. For the neural engine, we’re asking, ‘What do the moving parts look like, and can we identify them?’” Instead of focusing on the final command—reach right, move fast—his team is interrogating the neural dynamics that generate those commands, teasing out the mathematical rules that govern those patterns. “The dynamical model might initially seem less intuitive,” says Dr. Churchland, “but it explains a number of features of the data that are otherwise troublesome or ‘messy.’”

As with their earlier work, their current projects depend on data generated by specially trained monkeys, fitted with the same kind of microchips used to detect epileptic seizures in humans. In Dr. Churchland’s lab, the monkeys participate in tasks designed to elicit specific movements—reaching for small targets or manipulating a handle forward or backward, for example—in response to cues that allow the scientists to monitor the animal’s neural state and its muscular activity. “When the body is in motion, the brain is constantly changing its activity as it creates movement,” says Dr. Churchland. “By measuring the movements of the animal, and the changes in its muscles and motor cortex, we can begin to track how neural activity is generated and how it produces muscle activity and, thence, movement.”

Over the course of the past six years, Dr. Churchland and Dr. Cunningham have pursued their collaboration across institutions, time zones, and even continents. Reconvening at Columbia has been well worth the wait, says Dr. Cunningham, who accepted his Columbia faculty post in 2013, one year after Dr. Churchland arrived at P&S. “I’m a great believer in very close collaborations between computational and experimental researchers,” says Dr. Cunningham. “I want to sit with the experimentalist and have that person tell me what questions he or she is thinking about, what analyses should be done. And I want to say the same thing

“When the body is in motion, the brain is constantly changing its activity as it creates movement.”

about the experiments. I don’t think that Mark’s and my papers would have been nearly as interesting without that close collaboration.”

Dr. Cunningham was the first faculty recruit of the newly established Grossman Center. “Once we had secured the funding and the space, there was no doubt regarding who we wanted to hire,” says Dr. Churchland.

That closed-loop approach between experiment design and data analysis is not universally celebrated, says Dr. Cunningham. “The academic community historically has been largely focused on silos, what one investigator can do,” he says. “At Columbia, I feel encouraged to be a collaborative statistician and a collaborative neuroscientist.” Through initiatives including the Mortimer B. Zuckerman Mind Brain Behavior Institute, the Kavli Institute for Brain Science, the Center for Theoretical Neuroscience, the Data Science Institute, and the interdisciplinary NeuroTechnology Center launched in October, institutional support for collaborations among neuroscientists with appointments across Columbia’s schools has never been stronger.

The building momentum has an array of benefits, from opportunities for postdoctoral fellows to split time with more than one principal investigator and serve as intellectual bridges between labs to large-scale grant proposals where investigators have a wide array of intellectual resources available right on campus, in the event that they hit a bump on the path to discovery. “Biology, psychology, even chemistry, and certainly engineering have always been routes into neuroscience,” says Dr. Churchland. “If we’re to understand how the brain remembers, feels, emotes, and perceives, we need every tool that we can get and that means the work is intrinsically, highly interdisciplinary.” ♦

Alumni News & Notes

Marianne Wolff '52, Alumni News Editor

Peter Wortsman, Alumni News Writer

Additional class notes by
Bonita Eaton Enochs, Editor

1954

Glenn A. Langer founded the Partnership Scholars Program in 1996 to enable economically and culturally disadvantaged students to be competitive for entry into four-year colleges. Scholars are supported from seventh grade through high school graduation. They are offered “what a middle class family would provide for their college-bound child,” Glenn says. Thus far 327 seniors have graduated high school and 304 have been accepted to, are attending, or have graduated from a university.

1956

See In Memoriam for a remembrance of Ernest Vandeweghe '53 written by **Robert Osnos**.

1959

Peter Pressman spent his career as a breast surgeon in private practice in New York City. He spent many years at NewYork-Presbyterian Hospital, where he helped establish the breast center. His book, “Breast Cancer: The Complete Guide,” was published in five editions. After retiring from surgical practice in 2003, he directed the cancer genetics program at the Weill Cornell Breast Center for 10 years. He was appointed clinical professor emeritus of surgery at Weill Cornell in 2013. An endowed chair—the Peter I. Pressman, MD Professorship of Surgery—was established in his

honor in 2014. “It has been a wonderful career,” he writes. “I continue to live with my wife in New York City and Southampton.”

1960

See Alumni in Print to read about a book by **William R. Taylor**, who was a consultant to schools, clinics, and hospitals in central Connecticut before retiring. His wife, Barbara, is a graduate of Columbia's School of Social Work. They have three children and six grandchildren.

1961

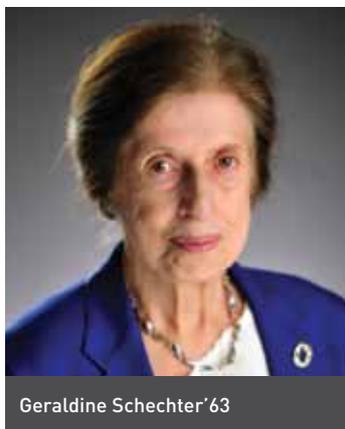
Charles Brill writes that he heard actor Alan Alda speak at the Philadelphia Speakers Series in September 2014. Mr. Alda “proudly mentioned that he was the commencement speaker at our graduation.” (Editor's Note: The text of Alan Alda's graduation speech to the Class of 1979 is now online at the magazine website, columbiamedicinemagazine.org).

1962

Henry Solomon has been appointed chief CME reviewer for MedPage Today. Henry is senior medical adviser and chair of the Professional and Corporate Consortium for the American College of Cardiology.

1963

Geraldine Schechter received the 2014 Stratton Medal for Clinical/Translational Research from the American Society of Hematology for her multifaceted contributions to the field of hematology and her commitment to hematology training and mentorship. Geraldine has been the cornerstone of hematologic care at the VA Medical Center in Washington, D.C., since 1965. She has helped to advance the diagnosis and treatment of chronic lymphoid malignancies and autoimmune hematologic disorders and has become well-known for her endur-



Geraldine Schechter '63

ing mentorship, editorship, and organizational leadership that has affected thousands of hematologists and medical students and helped shape hematology as a subspecialty in the United States. Geraldine is former chief of hematology at the VA, where she has served for more than 40 years. She also is professor emeritus of medicine at George Washington University.

1964

Walter Franck retired in January as senior associate dean of the Columbia-Bassett Program. Walter spent 41 years at Bassett Healthcare in Cooperstown. During that time he published 42 research papers and received awards for academic excellence and teaching. He brought rheumatology as a new subspecialty

to Bassett and created an immunology lab. In 1980 he became chief of medicine and director of medical education. In retirement he plans to travel and to spend more time with his children and grandchildren, but Cooperstown will remain his base.

1965

Robert D. Bach, a general surgeon in North Haven, Maine, and a member of the palliative care team at Eastern Maine Medical Center in Bangor, received the 2014 American College of Surgeons/Pfizer Surgical Volunteerism International Award, one of four awards given to volunteer surgeons who provide care to medically underserved patients domestically and abroad. Bob has been performing volunteer surgical procedures since he first traveled to Nicaragua's north Atlantic coastal region in 1976, where he performed operations in a mission hospital run by the Moravian Church. During the Sandinista-Contra War, he volunteered in Honduras, Guatemala, and St. Lucia. In 1992 the new regional government hospital in Puerto Cabezas, Nicaragua, was named after his late wife, Nancy Bach. Through his work in Nicaragua, he has developed teams of nurses, dentists, pediatricians, surgeons, emergency physicians, and medical



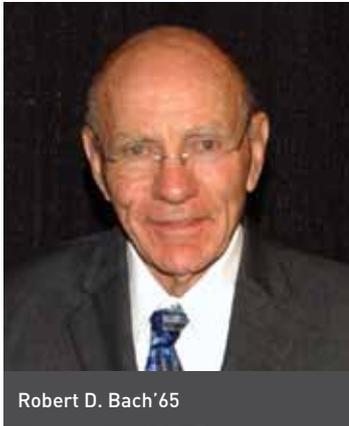
Walter Franck '64, fourth from right, with the first Columbia-Bassett graduates

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Robert D. Bach '65

technicians to serve the population. He continues to visit every spring and fall to teach and follow up on projects.

1966

Robin Cook received the 2014 Robert B. Parker Award, which recognizes outstanding accomplishment by an author or entity fostering the mystery genre in New England. Robin has written 33 mystery novels and is widely credited with introducing medical science to mystery writing to create the medical thriller genre. His 34th book, "Host," is scheduled to be released this year. The Parker Award was presented at the third annual Gala Mystery Night in December 2014 at the New England Mobile Book Fair, where mystery writers from all over New England signed books.

1969

John P. Bilezikian has been selected to receive the Dr. Oscar S. Gluck ISCD Humanitarian Award from the International Society for Clinical Densitometry. The award is presented to an ISCD member for distinguished service and dedication to the society. John previously was honored by ISCD as the first recipient of the ISCD Global Leadership Award, an award that

is now named for him. John is the Dorothy L. and Daniel H. Silberberg Professor of Medicine, professor of pharmacology, and chief of endocrinology at P&S.

1970

Henry Kronenberg was elected president-elect of the Endocrine Society for 2015-16. He will serve as president in 2016-17. Henry is chief of the Endocrine Unit at Massachusetts General Hospital and professor of medicine at Harvard Medical School. An active Endocrine Society volunteer for more than two decades, he has served as vice president for basic science and member of the society's leadership council. He also served on a number of society committees and has been an editorial board member for the society's basic science journals, *Endocrinology* and *Molecular Endocrinology*. He has received the society's Gerald D. Aurbach Award Lecture, the International Research Prize from the Austrian Society for Bone and Mineral Research, and the Gideon Rodan Mentoring Award from the American Society for Bone and Mineral Research.

1974

Elliott Antman is president of the American Heart Association for 2014-15. Elliott is professor



Elliott Antman '74

of medicine at Harvard Medical School and a senior physician in the cardiovascular division of Brigham and Women's Hospital in Boston. As president, Elliott serves as chief volunteer scientific and medical officer, responsible for medical, scientific, and public health matters for the AHA. A volunteer since 1977, Elliott chaired the association's Committee on Scientific Sessions Program in 2011 and 2012. He has authored or co-authored more than 700 scientific articles and has led numerous multicenter trials.

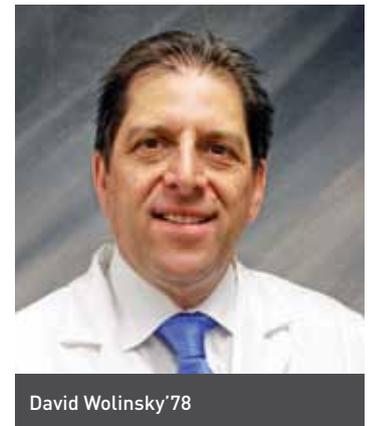
1976 PhD

See Alumni in Print to read about a book co-authored by **Marilyn J. August**. She trained in diagnostic virology and immunology as a postdoctoral fellow at Yale, which launched her career in clinical diagnostic virology. She worked in hospital and clinical diagnostic virology, microbiology, and infectious serology laboratories in southern California, later moving to the biotechnology industry in northern California when she joined Aviron (now MedImmune/AstraZeneca) as director of the clinical testing laboratory. She oversaw clinical trials that supported studies leading to approval of a live, intranasal influenza vaccine that was first licensed in 2003. More recently, Marilyn has consulted as



Marilyn J. August '76 PhD

a scientist and freelance medical writer-editor, mixing work with trips, hiking adventures, and activities as a Let's Look at Art docent for the San Jose Museum of Art. Marilyn was selected by the Santa Clara County Branch of the National League of American Pen Women as a "Letters Achiever" for 2014. The local branch of professional women in art, letters, and music selects two women each year in each artistic field to honor at a celebrity luncheon in San Jose, Calif.



David Wolinsky '78

1978

After eight years in solo cardiology practice in New York City and 22 years of private practice in a large cardiology group in Albany, N.Y., **David Wolinsky** joined the staff of Cleveland Clinic Florida in 2011. In 2014 he was appointed section head of nuclear cardiology and on Jan. 1, 2015, he became president of the American Society of Nuclear Cardiology.

1979

James Arden, who received a PhD from UCSF in 1994, was a clinical lead for neuroanaesthesia at King's College Hospital in London for several years before returning to the United States. He is now in the Department of Anesthesiology at the University of Cincinnati. Jim

LAURIE NAIMAN

and his wife, Melissa, are both dual citizens of the United States and the United Kingdom and will probably return to London after he has completed his stint in Cincinnati.

William H. Seitz Jr. received the 2014 John H. Budd Award from the Academy of Medicine of Cleveland and Northeast Ohio. He is professor of surgery in the Department of Orthopedics at the Cleveland Clinic Lerner College of Medicine at Case Western Reserve College of Medicine and chair of orthopedic surgery at Lutheran Hospital. He was sworn in as the 69th president of the American Society for Surgery of the Hand at the group's annual meeting in Boston in September 2014.

1986

Kevin Slawin reported that the company he founded 10 years ago, Bellicum Pharmaceuticals, went public Dec. 18, 2014, on Nasdaq, the first biotech IPO in Houston in 15 years. According to the company's website, Bellicum Pharmaceuticals is a clinical stage biopharmaceutical company focused on discovering and developing novel cellular immunotherapies for various forms of cancer, including both hematological and solid tumors and orphan inherited blood disorders.

1991

A paper that describes data from **Daniel Schechter's** NIMH K-23 award at Columbia/NYSPI was awarded a Best Scientific Paper Prize by the French Psychiatry Association. The prize was bestowed in France in November 2014. Dan is now a senior lecturer in psychiatry at the University of Geneva in Switzerland.

1996

Gregory Dorn was named president of Hearst Health, created in 2014 to encompass the Hearst Corporation's health care information businesses. "Jane and I currently live



Gregory Dorn '96

in Tiburon, Calif., with our four children," he writes. "When I can find time I spend it racing or cruising on our sailboat in and outside the SF bay."

1998

Stuart Levine has been named vice president of medical affairs at MedStar Harbor Hospital in Baltimore. He previously served as vice chairman of strategic growth and research in the Department of Medicine at both MedStar Good Samaritan and MedStar Union Memorial hospitals and as medical director of the Good Health Center at MedStar Good Samaritan Hospital. He also cochaired the Research Symposium Planning Committee for the MedStar Health Research Institute. Before joining MedStar Health, Stuart was assistant professor of medicine in the Division of Rheumatology at Johns Hopkins University, where he also



Stuart Levine '98

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See More Alumni News in e-News for Alumni

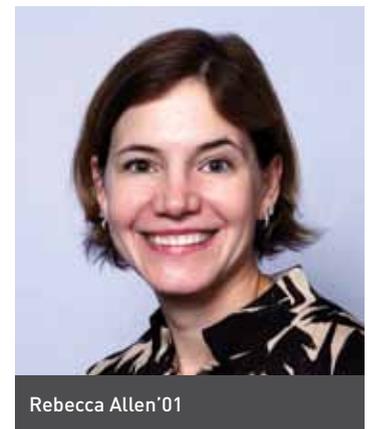
Here are a few alumni news items you missed if you didn't see the Winter 2015 e-News for Alumni on the magazine's website:

Thomas Mack '61 was reappointed by California's governor to chair the Carcinogen Identification Committee. ... **Jimmy Graham '75** is a member of a physician group that assists in the emergency department at Elbert Memorial Hospital in Georgia. ... **Robert Siegel '81** was featured in a Greenville, S.C., newspaper article about his move to the South after 23 years in Connecticut. ... **Mary Diana '92** joined the Mount Kisco Medical Group as a board-certified obstetrician & gynecologist. ... **Mitchel Seruya '06**, a hand and microvascular surgeon, joined the Texas Children's Hospital. ... **Sarah Fulham '11** joined Brattleboro Internal Medicine in Vermont.

See all issues of e-News for Alumni at columbiamedicinemagazine.org/webextras.

served as codirector of the Johns Hopkins Vasculitis Center.

The National Psoriasis Foundation honored **Bruce Strober**, who also received a PhD from Columbia, for his efforts to improve the lives of people living with psoriasis and psoriatic arthritis. Bruce received the foundation's Excellence in Leadership Award in October 2014 at a fund-raising event in New York City that raised more than \$225,000 to support psoriatic disease research. Bruce is vice chair, associate professor, and director of the clinical trials unit at the University of Connecticut Health Center's Department of Dermatology in Farmington, Conn.



Rebecca Allen '01

2001

See Alumni in Print to read about a book by **Rebecca Allen**. Rebecca is assistant professor of obstetrics & gynecology at Brown University's medical school. She also works in the ambulatory care division of the Women's Primary Care Center at Women & Infants Hospital of Rhode Island.

2011-2013

The Class of 2017 began its major clinical year Jan. 5 at the Steven Z. Miller Student Clinician's Ceremony. P&S alumni were among those honored for teaching: **Erika Marulanda-Londono '11**, **Geoff Rubin '12**, **Anne Holland-Pike '13**, and **Jake Kriegel '13**.



Bruce Strober '98

Stanley Chang'74: A Vitreoretinal Visionary

By Peter Wortsman

To paraphrase journalist and social commentator Malcolm Gladwell, some visionaries start with a clean sheet of paper and reimagine the world. Another kind of visionary, Stanley Chang'74, who is one of the world's leading authorities on the repair of vitreoretinal disorders, works with perfluoropropane gas and perfluorocarbon liquids and a panoramic viewing system he developed, in collaboration with Avi Grinblat, to repair retinal detachments and significantly restore or enhance the vision of countless individuals on the verge of blindness.

Dr. Chang is the K.K. Tse and Ku Teh Ying Professor of Ophthalmology, former chair of the Department of Ophthalmology at P&S, and former director of the Edward S. Harkness Eye Institute at Columbia University Medical Center.

Born in Shanghai, China, Stanley Chang emigrated to the United States with his parents at the age of 2 and grew up in the Bronx, where he attended the prestigious Bronx High School of Science. Initially following in the footsteps of his father, an engineer, he earned a bachelor's degree in electrical engineering from MIT and a master's in biomedical electronic engineering from the University of Pennsylvania, before pivoting to study medicine at P&S.

"I realized that if you become a bioengineer, you don't really understand the biologic problems," Dr. Chang says. "Engineering hones in on a little component of the big picture. If you want to have a global view of things, you have to be a physician to understand the problems you are going to solve with bioengineering skill. I wanted to use my aptitude for engineering but get more involved with people. Medicine seemed the perfect fit and P&S the perfect place to study it.

"Medical school was a great experience, probably one of the best times in my life," he says, crediting the influence of mentors on the faculty, including his faculty adviser, the late Donald Tapley ("so generous with his time"); the late Glenda Garvey'69 ("the ultimate clinician"); cardiologist Thomas Bigger, with whom he collaborated on research while still a medical student; ophthalmologist D. Jackson



Coleman, a pioneer in modern ultrasound technology; and David Abramson, a resident at the time with whom he co-authored a scientific paper and now chief of the ophthalmic oncology service in the Department of Surgery at Memorial Sloan Kettering Cancer Center.

Initially leaning toward cardiology, it was Dr. Chang's elder brother, Henry Chang, MD, a researcher in hematology at the NIH, who urged him to consider ophthalmology, because of the precision and the fine work involved. "My brother said, 'You might enjoy it.' He was right."

Dr. Chang pursued a residency in ophthalmology at the Massachusetts Eye and Ear Infirmary, a Harvard affiliate and at the time a center for innovative retinal surgery, and went on to complete a fellowship in vitreoretinal diseases at the Bascom Palmer Eye Institute at the University of Miami, where vitrectomy, removal of the vitreous as a preliminary procedure to facilitate repair of the retina, was first developed.

When his Columbia mentor, Dr. Coleman, was named chairman of the Department of Ophthalmology at Weill Cornell Medical College, he recruited Dr. Chang to join the team of topnotch faculty, including Harvey Lincoff, a pioneer in the use of gases in the repair of retinal detachment.

Making the Retina Do the Right Thing

"The eye is a sphere," Dr. Chang explains to the interviewer. "The retina sits in its lining. Neurons in the retina convert the light energy in the image into a signal that goes to the brain. The retina projects the image into the brain. The brain decodes it and, in turn, puts together an image for you. Part of the retina, the macula, the central part, gives you the sharp reading image. The peripheral retina gives you the night vision and the peripheral vision." But age and/or trauma can cause damage to this sensitive tissue. "Tears develop at the edges of the retina, which has no natural adhesive properties. A tear can progress to retinal detachment. In the case of a total retinal detachment, vision goes black."

Dr. Chang established a reputation as the go-to guy for complex retinal detachments, cases in which previous sur-

gical attempts at repair had failed and cases with a lot of scar tissue. “Each time the detachment occurs you lose photo receptor cells and neurons in the retina,” he says. “Our operative object was to preserve and/or restore the function of the retina after multiple detachments.” At the time, he said, “the operative technology was to insert tiny tacks to try to pin the retina down against the back of the eye,” but that can cause profuse bleeding. Also, the patient had to be turned upside down and operated on from below, a cumbersome and sometimes risky practice.

Dr. Chang helped to refine the use of long-lasting perfluoropropane gas and introduced perfluorocarbon liquids to do the job more smoothly and efficiently. He is best known for the innovative technique of injecting perfluoro-octane, a liquid heavier than water, as an intra-operative tool to flatten the retina against the back of the eye at the time of surgery and later replacing it with a gas bubble or silicon oil. “The liquid,” he explains, “flattens the retina, pushing all the bodily fluid out through the tear at the edges. It allows us to then apply a laser along the edges to repair the detachment.”

In the past, ophthalmic surgeons working with a flat lens were only able to see some of the central part of the eye and a limited part of the retina. Working in tandem with Avi Greenblatt, an optical engineer, Dr. Chang helped develop a special lens with a wide angle that increased the field of vision and permitted the surgeon to see the entire retina during the operation.

Stanley Chang '74 with Dr. Henry Kissinger, member of the board of advisors of the Edward S. Harkness Eye Institute



“It is a great personal satisfaction,” he says, “to see methods and tools you helped develop in the lab now used throughout the world. No more tables to turn patients upside down. No more tacks to pierce the retina and make it stay up.”

Esteemed for his skill and precision, Dr. Chang is also prized for his personable rapport with patients and his sensitivity to their concerns and those of their families. “I think it’s important to have good communication with patients and to understand their worries. That’s the mark of the difference between what we learned at P&S vs. what was taught at other medical schools. We focused on the patient as a person, not just on repairing the eye.”

Patient satisfaction is more than a statistic to him. It really matters. “I went into the field because, in general, ophthalmologists are very happy about what they do. They can really make a marked difference and help change the quality of people’s lives.”

In 1995 he was recruited back from Cornell as the Edward S. Harkness Professor, chair of ophthalmology, and director of the Harkness Eye Institute, a position he held with great distinction for close to two decades. He helped boost the institute’s annual research funding from \$1.5 million to more than \$5 million. Under his aegis, the surgical volume increased from 1,700 cases to almost 4,000 cases annually. The ophthalmic operating rooms earned the highest patient satisfaction ratings of any unit at NewYork-Presbyterian, and the department’s endowment increased from \$9.5 million to \$45 million, including the establishment of nine endowed professorships and six named lectureships. He also helped refocus the department’s NIH-funded research to encompass the areas of macular degeneration and glaucoma.

Dr. Chang is particularly proud of having assembled an outstanding team. “What’s exciting about a chair’s position is that you get to hire great colleagues, mentor them, and watch them grow. It’s not the chair who really counts, it’s the people he brings in and the group effort.”

Stepping down as chair permitted Dr. Chang to devote more time to his own ongoing research projects. His interests include the development of vitreous replacements, the pathogenesis of retinal detachments associated with optic disc anomalies, and the improvement of outcomes in macular and vitreoretinal surgery. He is particularly excited about “a new technology called adaptive optics, by means of which we can image the individual photo receptors in the living eye, using technology NASA used to take high resolution pictures of the moon.”

He sees patients three days a week, operates once a week, and devotes an entire day to academic affairs,

including making rounds with residents, meeting with research fellows, cultivating donors, and catching up with paperwork.

Dr. Chang still sees himself first and foremost as a teacher. “I came to the realization that I couldn’t do every complicated detachment, and the best thing I could do was to train young people who could hopefully do things even better than I could and carry on the field. I was lucky to have great mentors and I hope I’ve been a good mentor to others.”

Rather than attempt to clone him, his successor at the helm of the Eye Institute, George A. Cioffi, MD, recruited Dr. Chang’s son, Jonathan Chang’09, as assistant professor of ophthalmology whose surgical specialties include macular hole surgery, epiretinal membrane surgery, vitrectomy surgery, and scleral buckling. “It has rejuvenated me to work together.”

Another son, Gregory, is involved in video editing and freelance video.

Chairing the Faculty Committee of the New Wu Center for Global Health Initiatives

Throughout his career Dr. Chang also made time to help foster educational dialogue with China. His first return trip in 1979, as part of a medical mission to teach ophthalmic surgery with Project Orbis, came not long after the opening of relations with the United States, engineered by Secretary of State Henry Kissinger. Dr. Chang found conditions to be difficult and equipment scarce. (Having long revered Dr. Kissinger, Dr. Chang was pleased to get to know him personally when Dr. Kissinger joined the advisory board of the Harkness Eye Institute.)

Since that 1979 trip, says Dr. Chang, “Times have changed, China has caught up. I have visited eye hospitals much bigger than anything we have in the States, facilities with a thousand beds just for eye patients.” He has in recent years perceived a dynamic shift. “China wants to become a global leader in medical technology, medical science, and biotechnology.”

Dr. Chang welcomes the creation of the Wu Center for Global Health Initiatives (see story, Page 28) and is proud to chair its Faculty Advisory Committee. In his view, Columbia previously lagged behind other peer institutions in global outreach. “The Wu Center will do much to remedy that situation and hopefully restore Columbia to its historic role as a global leader in the exchange of educational models and ideas. China is definitely making a major push to invest in medical education. I am sure that in whatever way my colleagues at P&S choose to get involved they and our counterparts at Zhejiang University will derive great benefit from collab-

orations in research, clinical care, and teaching. I would also hope that our faculty members become interested in work done over there. The Chinese do a lot in herbal medicine, acupuncture, and plastic surgery, among other areas, that we could learn from.”

Proud of his Chinese heritage, he feels fortunate and proud to be an American as well. “The combination of Chinese and American values and work ethic is just mindboggling. It has made me succeed in my professional endeavors.”

He is cognizant, however, of a relative dearth of Asian senior faculty at Columbia and other schools of similar stature, a number hardly commensurate with qualifications and accomplishments. “As Asians,” he says, “we have the tendency to not speak up and toot our own horn but rather to be humble, do good work, and stay quiet about it. But from what I can tell, Asian chairmen have been pretty good at maintaining harmony and good relations among their faculty.”

Eye on the Future

Among countless encomia, he received the Hermann Wacker Prize of the Club Jules Gonin, the W.H. Helmerich Prize of the American Society of Retinal Specialists, the Lifetime Achievement Award and the Secretariat Award of the American Academy of Ophthalmology, and

“The combination of Chinese and American values and work ethic is just mindboggling. It has made me succeed in my professional endeavors.”

the Alcon Research Institute Award. He holds honorary memberships in a number of international retina societies and was recognized as one of three National Physicians of the Year by Castle Connolly in 2008.

Ever the visionary, Dr. Chang points out that “the eye is a perfect model for regenerative medicine and stem cell therapy.” He predicts that “it will probably be one of the first organs to use gene therapy effectively to treat conditions thought to be untreatable before.” He is also excited about the potential of new technologies to “see with greater precision and resolution than the naked eye permits.” But nothing, he insists, will ever replace “studied judgment and steady hands, the ability to detect tiny tears in the retina and to repair them with minuscule instruments. It’s still,” he says, “what matters most and what gives me the greatest satisfaction.”

● PROFILES IN GIVING

P&S Expands Its Global Reach with New Program in China

By Peter Wortsman

“If you give a man a fish he will have a single meal. If you teach him how to fish he will eat all his life,” wrote the Chinese philosopher Guan Zhong in the 7th century B.C. In the pedagogical spirit of this ancient wisdom, P&S and Zhejiang University School of Medicine, based in Hangzhou, China, have signed an agreement to collaborate on various research initiatives and educational exchanges.

The new Wu Center for Global Health Initiatives (with a focus on China) was established with a significant endowment from Columbia University Trustee Emeritus Clyde Y.C. Wu’56, and his wife, Helen Tseng Wu, with the endorsement of P&S Dean Lee Goldman. The center will oversee joint pilot research projects and exchanges of faculty and fellows at the two institutions.

Founded in 1912, Zhejiang University School of Medicine, which now comprises eight faculties and seven affili-

ated teaching hospitals, has risen to position itself as a leader in the 21st century and a fitting partner for P&S. The Chinese government is in the process of expanding its investment in education, the biomedical research infrastructure, and biotechnology. Zhejiang, one of China’s flagship institutions of higher learning, went through a recent administrative reorganization to meet the medical needs of the future.

The mission of the Wu Center, according to its founders, Dr. and Mrs. Wu, is to permit faculty from two outstanding institutions, and from others that may later join the endeavor, to put their minds together to pursue research and teaching in the medical sciences to benefit all. “Both the U.S. and China have great traditions of learning in many fields, including the medical sciences,” says Dr. Wu. “Each has proven strengths. Each can learn from the other and together develop treatment regimens and models of teaching and clinical care of universal significance.”

Dongrong Xu, PhD, associate professor of clinical neurobiology (in psychiatry) at P&S and an expert in the application of MRI to brain studies, holds an adjunct faculty appointment at Zhejiang University, his alma mater, and will serve as a pivotal academic link between the two institutions.

“It is an amazing bilateral possibility for professors in various departments and fields at P&S to become involved in research initiatives with professors at Zhejiang,” says Stanley Chang’74, the K.K. Tse and Ku Teh Ying Professor of Ophthalmology at P&S, who will co-chair a committee of faculty advisers for the center. “I’m sure all parties will derive great benefits from it.”

“An investment in the health and welfare of other institutions and other countries is an investment in our own health and welfare,” says Scott Hammer’72, the Harold C. Neu Professor of Infectious Diseases (in Medicine) at P&S, co-chair of the committee of faculty advisers.

Other members of the committee of faculty advisers are John Bilezikian’69, Ajay Kirtane’98, Maria Oquendo’84, Myrna Weissman, PhD, Nancy Wexler, PhD, June Wu’96, and Michael Yin’96. Additional faculty are expected to join the committee.

Clyde and Helen Wu and family



An advisory board also has been created for the center. Members so far are Ann Kaplan, a Columbia University Trustee, chair of the Columbia University Trustees Global Committee, and partner in Circle Wealth Management, an investment advisory firm; Nina Sun, a trustee of Barnard College, co-president of the Columbia Alumni Association Shanghai, and founder and president of Sunnybund Consulting and Sunnybund Education; Zhe Sun, professor, Institute for International Studies, and director, Center for U.S.-China Relations, Tsinghua University; and Lady Ivy Wu, who serves as chair or member of advisory boards for numerous charitable organizations, including the Hong Kong Red Cross, Red Cross China, and the Hong Kong Federation of Women. Additional advisory board members will be named in China and the United States.

On a visit to P&S in December 2014, as part of a delegation from Zhejiang, Dr. Xiaoming Li, associate dean of Zhejiang University School of Medicine, outlined some of his institution's plans for the collaboration with P&S. "In order to promote the collaboration between professors and researchers of the two universities," he said, "discussions are currently under way for the two sides to hold an annual symposium to promote interaction in cutting-edge research and to encourage discussion of projects with potential for further collaboration." Other members of the Chinese delegation were Dr. Weifang Zhang, vice president and director of international affairs, Office of Children's Hospital, an affiliate of Zhejiang School of Medicine; Jing Chen, vice director of the Office of International Relations of ZJU School of Medicine; Drs. Manli Huang and Shaohua Hu, both members of the Department of Mental Health at the First Affiliated Hospital; and Dr. Xuan Xu, vice director of the personnel department at Zhejiang University and ZJU's local coordinator for the greater New York metropolitan area.

The delegation from China was welcomed by Anke Nolting, PhD, inaugural director of the Wu Center, and met with selected members of the center's faculty committee and several administrators.

Back to the Future, the Columbia Way

The link between Columbia University and Chinese institutions of higher learning goes back to the 1920s. Lecturing throughout China from 1919 to 1921, the renowned American philosopher John Dewey, who held a joint faculty appointment in the Department of Philosophy of Columbia University and at Columbia Teachers College, found welcome ears for his theories of progressive education. A student of Dewey's at Columbia, Hu-Shi, who received a PhD degree in 1927 and honorary doctorate in law in 1939, would become known as the "father



of the Chinese renaissance in education." He returned to China to teach philosophy at Peking University, where he was later named president. He subsequently served as China's ambassador to the United States.

Dr. Hu-Shi also served as a trustee of Peking Union Medical College in Beijing, an institution founded by the Rockefeller Foundation that would grow into one of China's—and Asia's—most prominent and influential medical schools. Several members of the PUMC faculty, including histologist Aura Severinghaus, surgeon-bacteriologist Frank Meleney (a 1916 P&S graduate), plastic surgeon Jerome Webster, and pharmacologist Harry Van Dyke, pursued their pioneering research while in China and later returned to the United States to join the faculty at P&S, where they further developed and applied their research findings. Among the most illustrious Chinese faculty members at PUMC was biochemist Hsien Wu, who developed the Folin-Wu Urine Test for blood sugar in collaboration with Otto Folin.

Prominent Columbians in China include two other presidents of Peking University, Chiang Monlin (PhD'1917 and a student of Dewey's) and Ma Yinchu (PhD'1914). V.K. Wellington Koo (BA'1909, PhD'1912) was a Chinese diplomat present at the founding of the League of Nations and the United Nations.

Cognizant of this historic link and eager to build on it, Dr. and Mrs. Wu in 1994 established the Wu Sino-American Exchange Program at P&S for distinguished P&S faculty members to lecture in China and Chinese educators to visit P&S to observe the American medical school structure and curriculum and to direct a restructuring back home. Wu Fellows at P&S, many of whom went on to positions of leadership in China, have included Chen Zhu, former Chinese Minister of Health; PUMC Dean Zheng Chaoquiang and fellow educator Zhao Yupei, who successfully applied the lessons learned at Columbia in curriculum reform to the Chinese academic model;

Anke Nolting, right, escorts a delegation from China around the CUMC campus

PHOTO BY RICKY OWENS



From left: Michael Yin '96, June Wu '96, and Scott Hammer '72

PHOTO BY RICKY OWENS

Li Zuewang, who is prominent in renal disease and medical administration; Chen Shuchang, division chief of oncology and chemotherapy at PUMC; and Qin Shulin, now an established Chinese authority in HIV research.

The extraordinary philanthropy of Dr. and Mrs. Wu also has included the endowment of five professorships at P&S, creation of the Wu Center for Molecular Cardiology, generous support for the new medical education building under construction, and a host of other important initiatives at Columbia.

“The Wu Global Center is the crowning glory of Clyde and Helen’s largesse,” says P. Roy Vagelos ’54, former chair and CEO of Merck & Co. and chair of Defining the Future, CUMC’s capital campaign.

Six Planned Collaborative Programs (with Others in the Works)

The Wu Center will help encourage and foster collaborative programs with P&S based at Zhejiang University School of Medicine and its teaching hospitals in various fields, particularly those in which P&S has demonstrated excellence. These areas include endocrinology, neuroscience, infectious diseases, interventional cardiology, mental health, reconstructive surgery, and transplant surgery. Other areas include oncology, immune therapy, and ophthalmology.

John P. Bilezikian ’69, the P&S Dorothy L. and Daniel H. Silberberg Professor of Medicine, professor of pharmacology, and chief of endocrinology at New York-Presbyterian Hospital, is an internationally renowned investigator who has frequently lectured in China. He calls the new center a golden opportunity to extend his ongoing comparative study of the micro-architecture of bones as an

indicator of risk for fracture due to osteoporosis in Chinese and Caucasian women. He also hopes to continue his practice of training and mentoring young researchers from China—and elsewhere—in his lab.

Like Dr. Bilezikian, Michael Yin ’96, associate professor of medicine in the infectious diseases division, is interested in bones, but from a different perspective. An expert in HIV therapy and metabolic complications, he also holds a master’s degree from the Mailman School of Public Health and is engaged in ongoing investigations of bone health in HIV-infected women and perinatally HIV-infected children. He has lectured frequently in China and plans to take advantage of the Wu Center to pursue collaborative clinical research at Zhejiang.

June Wu ’96, assistant professor of surgery at P&S and a rising star in plastic surgery, plans to introduce in China a biologically based model developed at P&S to treat patients with vascular anomalies. A native of Hong Kong, she has operated in China on young children with cleft lip and other birth anomalies.

The center is very much a Wu family venture. Dr. and Mrs. Wu’s sons, Roger Wu, MD, a child psychiatrist based in San Francisco, and David Wu, MD, a pulmonologist in Detroit, have expressed their strong commitment, as has Clyde Wu’s brother, Sir Gordon Wu, chairman of the board of the Hong Kong infrastructure firm Hopewell Holdings Ltd.

Center director Dr. Nolting will bring to the venture her years of experience and savvy as associate dean and executive director of alumni affairs and development at P&S. A forensic anthropologist by training, she also holds an MBA from Columbia’s business school. “I am thrilled to take on the reins of this exciting new challenge,” says Dr. Nolting. “It’s still a work in progress, but all the players and pieces are coming together. America and China have much to learn from each other, and I cannot imagine any better partners to engage in this dialogue than P&S and Zhejiang University School of Medicine. In addition, the dynamism of Hangzhou, one of China’s most ancient and beautiful cities and a hub of commerce and innovation in the 21st century that has been dubbed China’s Silicon Valley, makes it an ideal locale to launch this educational partnership.”

To Dr. and Mrs. Wu it is a matter of forging a lasting legacy, of bringing together the things that have mattered most to them: America, where they made their life; Columbia University, where Dr. Wu learned the art of medicine; and China, the country and culture that shaped their ideals. “We spread the good word and planted the seeds,” says Dr. Wu. “Now the time has come for others to plough the field and reap the fruits.”



Comic Relief: Ben Schwartz'08

By Sharon Tregaskis

Every Tuesday morning, Ben Schwartz'08 packs up a sheaf of 9x12 Bristol paper featuring 10 original cartoons and heads for the New Yorker's headquarters. In the magazine's Cartoon Lounge, he swaps tall tales with the competition—15 or more fellow artists, from first-timers to industry veterans—as he awaits his turn with Bob Mankoff, the magazine's cartoon editor.

Their meeting lasts just minutes, as the editor considers each of the drawings. The editor sets aside his favorites for discussion with the magazine's editorial staff and hands back the rest. With as many as 300 proposals on any Tuesday and slots for just 10 cartoons in each issue, the competition is stiff. On a good Friday, Dr. Schwartz gets word that the venerable weekly intends to purchase one, perhaps even two, of his sketches.

Dr. Schwartz made his first foray into the cartoonist's inner sanctum in 2011. "First thing Bob said was, 'Well, you can draw,'" says Dr. Schwartz. "That wasn't particularly a compliment, just an observation. But it was

profoundly moving. It's one thing for your medical school classmates to say, 'Hey, you're a pretty good artist' but another thing for an incredibly accomplished cartoonist to offer external validation." The New Yorker has since purchased 90 sketches by Dr. Schwartz, each with the artist's angular signature in the corner.

In his fifth-grade yearbook, Dr. Schwartz listed his professional trajectory as "a comic book artist or a doctor" and he landed his first paying gig as a cartoonist at age 15 (for a necktie ad campaign). Academically, he excelled, earning an MD from P&S and landing an internship at NewYork-Presbyterian. All the while, his misgivings multiplied. "I kept hoping that I'd flunk out," he recalls, "that someone would identify me as a fraud and say, 'You can't be here. You're not one of us.'"

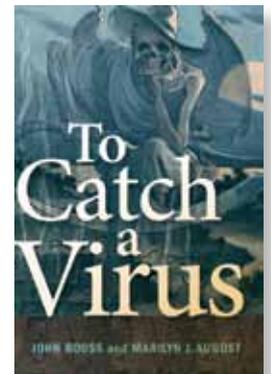
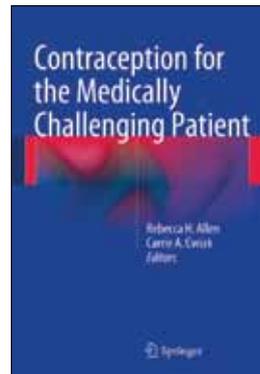
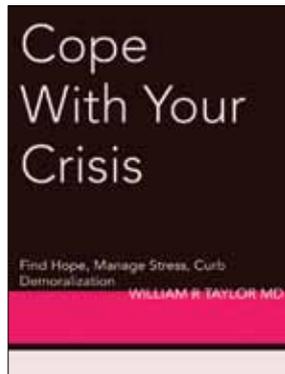
At the end of his internship, Dr. Schwartz opted to forgo further medical training to start drawing in earnest. Sometimes in the Cartoon Lounge, another scribbler will introduce him as a physician. Dr. Schwartz corrects them. "I say a fake doctor, or kind of a doctor—doctor-ish, maybe," he says. He is equally cautious about the sources from which he draws inspiration. "Doctors and medicine are good fodder and I definitely have a handful of pieces about that stuff," he says, "but I try not to let that define me as a general gag cartoonist."

In 2012, Columbia's Department of Ophthalmology invited Dr. Schwartz to work with a member of the faculty to supplement the standard introductory curriculum with a series of interactive, online learning modules presented in a humorous, comic book format. More recently, Rita Charon, MD, PhD, director of the narrative medicine program, invited him to teach a course on the graphic novel. He is now included on Dr. Charon's faculty for the narrative medicine elective taught at P&S every spring. He also teaches first-year P&S students in the "Foundations of Clinical Medicine" course and has mentored students on visual arts as part of their scholarly projects.

Last fall, Deborah Cabaniss, MD, director of the P&S Virginia Apgar Academy of Medical Educators, engaged him to develop a series of training videos with academy members. The first two, on planning effective learning objectives and on giving feedback in the clinical setting, were posted on YouTube in July. "One of the reasons I wasn't happy on the traditional doctor path is that I just felt disconnected from the work I was doing," he says. Blame it on artistic ego, says Dr. Schwartz, but he craved a professional path to which he alone was uniquely suited. "Now," he says, "I feel like I am doing that."



"Say 'eh.'"



alumni *in print* By Bonita Eaton Enochs, Editor

Cope With Your Crisis: Find Hope, Manage Stress, Curb Demoralization

William R. Taylor '60

Amazon Digital Services, 2015

“Cope With Your Crisis,” the newest Kindle edition book by Dr. Taylor, provides advice on stress relief for adults and older adolescents. The child and family psychiatrist notes: “Too many parents, other adults, and older teens struggle in silence. They feel that they have more problems than other people, they don’t know where to begin, or whom to talk to. They often doubt that anyone else suffers as much.” Dr. Taylor says the book does not cover the entire range of emotional stressors, and he encourages anyone struggling with suicidal or homicidal impulses to seek emergency help. “My ebook alone would not be enough, but I hope it can enable some readers to head for help before they need an emergency room.”

Contraception for the Medically Challenging Patient

Rebecca H. Allen '01 (co-editor)

Springer SmartBook, 2014

Dr. Allen’s book offers advice on how to meet the contraceptive needs of women who have chronic medical problems, such as endocrine, rheumatologic, gynecologic, and gastrointestinal disorders and psychological and neurological conditions. By addressing common misconceptions and lack of knowledge about

patients who are potentially at risk, the book provides guidance to physicians on how to correctly prescribe contraception for women using potentially teratogenic medications. Many women with chronic medical problems do not obtain adequate preconception and contraception care, and the editors note that despite published guidelines by the CDC, medical practice does not reflect the appropriate use of contraception in women with coexisting medical problems, including HIV/AIDS, uterine fibroids, or cardiac, neurologic, or thyroid disease.

To Catch a Virus

Marilyn J. August '76 PhD (co-author)

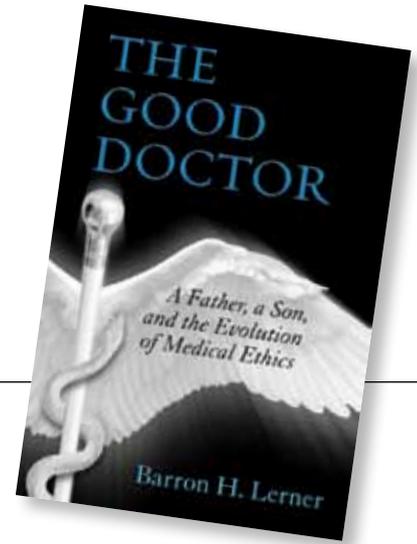
American Society for Microbiology (ASM) Press, 2013

Dr. August, who received her PhD in virology with an emphasis on electron microscopy, and co-author John Booss, MD, an emeritus Yale professor, have chronicled in “To Catch a Virus” the science, technological advances, medical urgencies, and human stories that chart the development of the field of diagnostic virology. Describing historical discoveries that defined the role of viruses in infectious diseases and recounting advances into the 21st century, the authors explain how scientists applied revolutionary technologies to study viruses, first in animal models and tissue culture before progressing to molecular and genetic techniques.

↙ *send books (published within the past two years) to:*

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Book Excerpts: *Student Rotations Shape Interest in Ethics*

A description of the latest book by Barron Lerner’86, “The Good Doctor: A Father, a Son, and the Evolution of Medical Ethics,” was included in the Spring 2014 issue’s Alumni in Print. The paperback version of the book was published in May 2015.

In the book, Dr. Lerner compares his own experiences as a physician with those of his father, an infectious diseases specialist.

Below are a few excerpts from the chapter, “The Second Dr. Lerner.” The excerpts describe moments from his P&S obstetrics & gynecology and pediatrics rotations that informed his later work in medical ethics. His memories were aided by notes he kept in a diary.

Some students, particularly those who were very proficient or intended to become surgeons, had few qualms about learning on patients. The rest of us and some of the residents joked about our flubs and successes. But no one discussed the ethics of the situation. Did students, indeed, have a right to do these procedures? How many times was it acceptable to try before giving up? And were you obligated to tell patients that you were doing a particular procedure—possibly even something as invasive as a spinal tap—for the first or second time? Not surprisingly, I chose an ethics topic for a presentation I needed to do for the rotation: the treatment of severely disabled neonates. For decades, paternalistic physicians had quietly left such babies to die, not necessarily even telling parents they could possibly be saved, albeit with major physical and mental deficits. Such lives, these doctors believed, were not worth living. But in an era of patient autonomy, parents were being given the option to pursue aggressive treatment. I applauded this development, although as a medical student, I had admittedly not seen any such children.

The ob/gyn rotation was an enormous learning experience for me in other ways. I was on call every fourth night. Sleeping, which took place in a tiny, overheated room while the student was wearing paper scrubs, was technically allowed but not exactly encouraged. Deliveries almost always seemed to happen in the middle of the night, and if you were in the call room, no one was going to come and find you. And the residents liked having students around to do the trivial tasks—known as scut work—for

them. Some of my fellow students simply said no to scut. Some had the ability to lie down in bed and fall asleep immediately. I could do neither. One day I wrote that things seemed “somewhat out of control” because I had slept for only 45 minutes the previous night and was still trying to function more than 30 hours after I had arrived at the hospital. If anything, the house staff worked even harder and longer than I did.

The constant workload was difficult for me for two other reasons. First, there was very little time to read about the diseases that I was encountering. Given the choice between reading and sleeping, I preferred to sleep. Second, an 80- to 100-hour workweek was cramping my style. I had prided myself on maintaining a diversity of interests during the first two years of medical school. But now there was very little time to read the New York Times, much less jog, go to the gym, eat out, or engage in political activities. What did it mean that, this early in my career, I was fighting what I called a “maniacal devotion to medicine”? But how could I become a patient-centered physician like my father and his generation of doctors without completely focusing on my work?

In contrast to obstetrics, with its unpredictability and fast turnover of patients, inpatient pediatrics featured a large number of ongoing, devastating cases. Not surprisingly, I was drawn to the family dynamics and the ethical issues raised by such sad stories.

Once again, I struggled with my role. My resident had made me the official blood drawer for one of the boys. Although I was able to obtain the blood, he cringed and screamed whenever I came into the room, making it difficult for me to develop any type of relationship with him. His mother told me that he was starting kindergarten in the fall, but we both knew he would never finish school. Fortunately, many of the pediatric residents and attendings prided themselves on dealing with such profoundly challenging cases. The pediatricians’ egos, I wrote, were smaller than those of other physicians. I learned a great deal from their ease at interacting with both the sick children and their parents.

FACULTY

John F. Bertles, MD, professor emeritus of medicine, died April 6, 2014.

David M. Carberry, MD, PhD, retired associate clinical professor of surgery at Harlem Hospital Center, died April 17, 2014.

Edgar M. Housepian, MD, professor emeritus of clinical neurological surgery, died Nov. 14, 2014. (See Alumni In Memoriam, Class of 1953, for more information.)

Dolores Kreisman, PhD, associate clinical professor of medical psychology (in psychiatry), died Aug. 20, 2014.

Kevin L. Macken, MD, retired associate clinical professor of radiology, died Feb. 9, 2014.

Elizabeth "Ellie" Paras, MD, assistant professor of medicine, died Dec. 4, 2014.

Gene-Ann Polk, MD, professor emeritus of clinical pediatrics and longtime Harlem Hospital director of pediatrics and ambulatory care, died Jan. 3, 2015.

John C. Sinclair, MD, former associate professor of pediatrics, died May 2, 2014.

Harold F. Spalter, MD, professor emeritus of clinical ophthalmology, died July 4, 2014.

Mervyn Susser, MB, BCH, the Sergievsky Professor Emeritus of Public Health (Epidemiology) and founder of Columbia's Gertrude H. Sergievsky Center, died Aug. 14, 2014.

**ALUMNI
1942**

Condict Moore, professor of surgery emeritus at the University of Louisville School of Medicine, died Aug. 14, 2014, at age 98. He served as ship's surgeon and as a psychiatrist in the U.S. Naval Reserve at the Memphis Naval Hospital during World War II. Dr. Moore established one of the first Breast Cancer Detection Demonstration Project programs in Louisville, where he introduced the use of mammograms. The author of some of the earliest published research on the link between tobacco and cancer, he was a founder and the first director of the James Graham Brown Cancer Center at the University of Louisville, where he taught for more than three decades. Survivors include his wife, Caroline, three daughters, a son, eight grandchildren, and four great-grandchildren.

1944

William A. Blodgett, a retired internist, died Dec. 14, 2014. Following World War II he served as a captain in the U.S. Army, where he completed his medical training. He pursued a private practice in Louisville, Ky., for 52 years, was a member of the clinical faculty at the Louisville School of Medicine, and maintained an affiliation with Norton Memorial Hospital, where he served for a time as supervisor of cardiac rehabilitation. Preceded in death by his first wife, Jean, he is survived by his second wife, Louisa "Weasy," two daughters, two sons, a step-daughter and a step-son, five grandchildren, and two step-grandsons.

1945

L. Dwight Cherry, a retired surgeon, died June 5, 2014, at age 93. He served in the U.S. Naval Reserve. An emeritus associate professor of surgery at the University of Nebraska medical school, Dr. Cherry maintained affiliations with Lincoln General Hospital, St. Elizabeth Community Health Center, and Bryan Memorial Hospital in Lincoln, Neb. He served as president of the Community Blood Bank and the



Mervyn Susser



L. Dwight Cherry '45

Lancaster County Medical Society and as governor of the American College of Surgeons. He was an accomplished horseman and a farmer in his spare time. Preceded in death by his wife, Ava Lynne, Dr. Cherry is survived by a daughter, a son, four grandchildren, and two great-grandchildren.

1946

Michael J. Langan, a retired obstetrician/gynecologist, died Nov. 22, 2014, of complications from a stroke. He pursued his medical studies under the V-12 Program of the U.S. Navy and subsequently served as a lieutenant assigned to the St. Albans Naval Hospital in Queens and, later, to Midway Island in the Pacific. He was recalled to active duty during the Korean conflict. An early proponent of natural childbirth, he championed the Lamaze and Leboyer methods of natural childbirth and encouraged breastfeeding for new mothers. He pursued a solo private ob/gyn practice in Greenwich, Conn., which later became the Brookside Obstetrics & Gynecology Associates. He was a past president of the Westchester Ob/Gyn Society. A devoted alumnus, Dr. Langan served

for many years as chair of the Class of 1946 and as an active member of the Alumni Council. He is survived by his wife, Kathleen (Kay), four daughters, two sons, and 12 grandchildren.

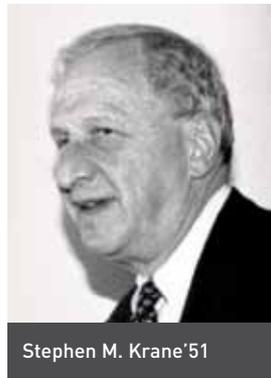
Richard P. Keating, a retired internist, died Aug. 3, 2014, at age 91. Dr. Keating served in the U.S. Army, stationed at the Los Alamos Scientific Laboratory, where he was among the first researchers to work with radioisotopes. For more than three decades he pursued a private practice, specializing in thyroid disorders, in Ridgewood, N.J. He maintained associations with Valley Hospital in Ridgewood and St. Luke's Hospital in New York, where he directed the thyroid clinic. A past president of the Bergen County Medical Society, he belonged to a dynasty of family members who attended P&S, including his father, John H. Keating Sr.'1917, brothers, John H. Keating Jr.'43 and Paul Keating'54, and son, David P. Keating'90. In retirement, Dr. Keating served as chairman and selectman of Truro, Mass., and trustee of the Truro Public Library and Outer Cape Health Services. He is survived by his wife,



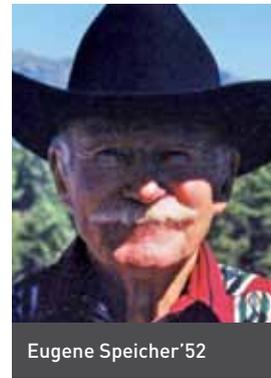
McCoy Pitt '46



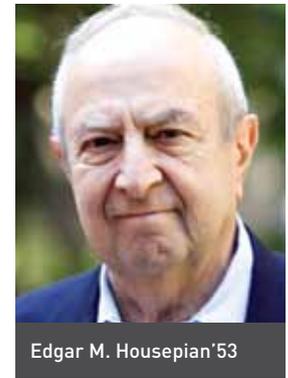
Louis J. Vorhaus '46



Stephen M. Krane '51



Eugene Speicher '52



Edgar M. Housepian '53

Barbara, five children, 11 grandchildren, and five great-grandchildren.

McCoy Pitt, a retired obstetrician, died June 22, 2014. Dr. Pitt spent close to four decades in private practice in Decatur, Ala. Of his time at P&S, he fondly recalled an elective in anesthesia with the legendary Virginia Apgar '33. "Her keen intellect and great enthusiasm were contagious to everyone," he wrote. "What she taught me enabled me during my senior year to get a job giving obstetrical anesthesia for night deliveries at PH. ... All this kindled my interest in ob/gyn, which is what I have spent my career doing. This great lady ranks right up at the top of all the great physicians that I have known or been associated with." Dr. Pitt was the first board-certified obstetrician in Morgan County, Ala. He served in the U.S. Army Medical Corps following World War II, stationed in Takasaki, Japan. He was president of the Decatur Civitas, a board member of the Hospice for the Valley, and a member of the Arts and Sciences Leadership Board at the University of Alabama. He is survived by his wife, Ann, a daughter, a son, two granddaughters,

four grandsons, and three great-grandchildren.

Louis J. Vorhaus, a retired internist and emeritus member of the faculty in the Department of Medicine at Weill Cornell Medical College, died Oct. 18, 2014. Critical of managed care as a medical model, Dr. Vorhaus once wrote on an alumni reunion questionnaire: "Physicians had a sliding scale. The wealthiest patients paid the most, the poorest paid least, the indigent paid nothing. The system worked well and there was no third party with its hand in your pocket." Preceded in death by his wife, Natalie, he is survived by his partner, Lillian Rifkin, three daughters, a son, and 12 grandchildren.

1948
Ralph Lusskin, a retired orthopedist, died Jan. 17, 2015. He served as an orthopedic surgeon on the U.S.S. Relief during the Korean conflict, retiring from the U.S. Naval Reserve as lieutenant commander. An emeritus clinical professor of orthopedic surgery at NYU School of Medicine and for many years chief of orthopedic surgery at the New York VA Hospital, he pursued research in adult

spastic deformities, spinal cord disease management, silicone implantation in skeletal surgery, and computer management of orthopedic clinical information. Dr. Lusskin is survived by his wife, Phyllis, two daughters, and four grandchildren.

1950
Aimee Diefenbach Larkin, a retired allergist, died Jan. 13, 2015. Dr. Larkin served as chief of the Department of Allergy and Immunology at White Plains Hospital in White Plains, N.Y. When not attending to the sneezes, itchy eyes, and other allergy ills of her devoted patients, she enjoyed painting, photography, reading, knitting, and doing the Sunday New York Times crossword puzzle. Preceded in death by a son, she is survived by her husband, Philip C. Larkin, MD, two daughters, four sons, and 17 grandchildren.

1951
Stephen M. Krane, a renowned rheumatologist known for his study of the organization, structure, and remodeling of skeletal and other connective tissue, died Jan. 19, 2015. His interest in metabolic bone diseases began as a medical student at P&S.

The Persis, Cyrus and Marlow B. Harrison Professor of Medicine and Master of the Walter Bradford Cannon Society at Harvard Medical School, Dr. Krane was a longtime chief of rheumatology at Massachusetts General Hospital, where he undertook studies on biomineralization and the potential rate of extracellular matrix (ECM) proteins. He also did important work on pathogenesis of ECM destruction and joint remodeling in rheumatoid arthritis and was co-editor (with the late Louis V. Avioli) of three editions of the textbook "Metabolic Bone Diseases and Clinical Related Disorders." Throughout much of his career he directed the clinical program in rheumatology at MGH and was active in clinical teaching. Dr. Krane was a fellow of the American Academy of Arts and Sciences and the recipient of the 1990 Paul Klemperer Award of the New York Academy of Medicine, the 1996 Gold Medal for Distinguished Achievements in Medicine of the P&S Alumni Association, and a 2003 Docteur Honoris Causa from the University of Paris VII-Denis Diderot. Dr. Krane was a loyal alumnus and generous

supporter of the medical school. Preceded in death by his wife, Cynthia, he is survived by four sons and eight grandchildren.

1952
Retired urologist **Eugene Speicher** died Oct. 10, 2014. He was 92. Passionate about medicine and music, he left a generous bequest in his will to establish a named scholarship at P&S "to be awarded to a future doctor who has a love and talent for classical and/or jazz music and can play it." Preceded in death by his wife, Genevieve, a 1947 graduate of the Columbia School of Nursing, he is survived by three children, 10 grandchildren, and 11 great-grandchildren.

1953
Edgar M. Housepian, professor emeritus of clinical neurological surgery at P&S, co-founder of the Fund for Armenian Relief, and devoted P&S alumnus, died Nov. 14, 2014. Following a tour of duty as an aviator in the Navy Air Corps, he entered P&S, where the daring work then being done in neurosurgery captured his imagination. Subsequently honing his skills at the Neurological Institute, he went on to join the clinical faculty in the

Department of Neurological Surgery and played an important role in the early development of the field of functional stereotactic surgery. At P&S, he worked with his mentor, the late J. Lawrence Pool'32, on early surgical procedures to treat Parkinson's disease and other functional neurological disorders. Challenged by Dr. Pool to be innovative, Dr. Housepian developed a universal needle holder and a bipolar grid that greatly improved accuracy. In addition, he and the late Malcolm Carpenter collaborated on the first development of coordinates for the globus pallidus by brain measurements, with results confirmed by stereotactic biopsy studies. Dr. Housepian also collaborated with Vernon Mark at Harvard in the design of another stereotactic instrument that increased the effectiveness of thalamic stimulation and the accuracy of thalamotomy. Working with yet another colleague, Dominic Purpura, Dr. Housepian participated in landmark research in electrophysiology of the brain in animal models, findings that he was able to translate into clinical studies. He is also noted for the success of his operations on orbital tumors,

cancers of the optic nerve, for which he established a widely followed protocol. "One of the reasons I've loved being at Columbia," he once said, "is that the institution allowed me to be truly creative." He repaid the kindness in 1994, playing an instrumental role in establishing the J. Lawrence Pool'32 Professorship in Neurological Surgery. Another cause to which he committed himself heart and soul was the medical response in the wake of the 1988 Armenian earthquake. Spearheading relief efforts, he helped organize the gathering and shipment of medical supplies and equipment and played a leading role in coordinating postgraduate medical educational exchange with Armenia. He received the 2002 Humanitarian Award of the American Association of Neurological Surgeons, an honorary doctorate from the Academy of Sciences of Armenia, and the Gold Foundation Humanitarian Award at P&S, where a professorship was endowed in his name. He was a loyal and active P&S alumnus, longtime class chairman, alumni director, an active member of many committees, some of which he chaired, and staunch supporter of the

medical school. In 1990 he received the Gold Medal for Service to P&S and its Alumni Association. Following his retirement from teaching and practice in 1997, he was appointed special adviser to the dean for international affiliations. Preceded in death by his wife, Marion, he is survived by a daughter, two sons, including David Hovsepian'86, and a grandson.

Lewis Kurke, a retired psychiatrist who specialized in the treatment of substance abuse and traumatic stress, died May 29, 2013. In the course of his long career he provided psychiatric and psychopharmacological care to mentally ill inmates for the Arizona Department of Corrections and psychiatric care to troops at Cutler Army Hospital in Fort Devens, Mass., Landstuhl Army Medical Center and U.S. Army Hospital in Bad Cannstatt in Germany. A former lecturer in the Department of Psychiatry at the University of Arizona, he served a term as president of the Governing Council of the Psychiatric Services Section of the American Hospital Association. Before relocating out west, he taught as associate professor in the Department of Psychiatry and

Behavioral Science at the State University of New York at Stony Brook and served a term as president of the Suffolk branch of the American Psychiatric Association. He is survived by his wife, Nancy, three daughters, and a son.

Ernest Vandeweghe, a star basketball player for the New York Knicks who juggled Knicks practice with medical studies, died Nov. 9, 2014. He was 86. He retired from professional basketball after six seasons to pursue a career in pediatrics. His was a family of athletes: His brother-in-law, Mel Hutchins, also played for the Knicks. A daughter, Tauna, was a star Olympic swimmer. One son, Kiki, also played for the Knicks. Another son, Bruk, won a bronze medal in beach volleyball at the 1994 Goodwill Games in St. Petersburg, Russia. A granddaughter, Heather Shannon, was captain of the national women's polo team. Another granddaughter, Coco Vandeweghe, competed as a member of the women's pro tennis tour. He was preceded in death by his wife, Colleen, Miss America of 1952. After leaving professional sports he moved to Los Angeles, where he

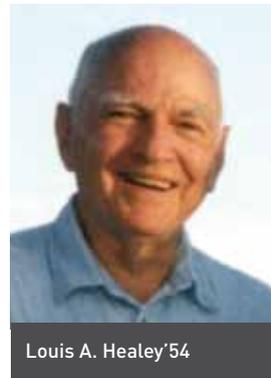
opened a private practice in pediatrics, joined the UCLA faculty as an associate clinical professor of pediatrics, adolescent and sports medicine, and served for a time as team physician and team consultant to the Los Angeles Lakers. He was appointed by President Gerald Ford as a member of a commission to enhance America's amateur athletic presence in international sports. A New York Times obituary quoted from "The New York Knicks," a 50th anniversary history of the team, in which Dr. Vandeweghe addressed the unusual pairing of a professional sports career and medical school: "People asked me why I would try to play ball while going to med school. Well, I was not much of a social butterfly. My social event was to turn up in Madison Square Garden in a Knicks uniform. It was what I preferred to drinking with the boys or going to the movies."

1954

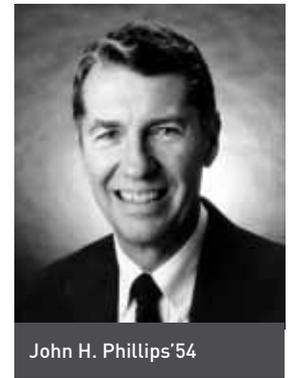
Louis A. Healey, a retired internist specializing in rheumatology, died Dec. 28, 2014. He served as a captain in the U.S. Army Medical Corps, based at Ford Ord in California. Dr. Healey was a clinical pro-



Lewis Kurke '53



Louis A. Healey '54



John H. Phillips '54

fessor of medicine emeritus at the University of Washington in Seattle, where he practiced for many years and headed the arthritis and immunology section at the multispecialty Virginia Mason Clinic. He served as a past president of the Seattle Academy of Internal Medicine and was a recipient of the 1991 Distinguished Rheumatologist Award of the American College of Rheumatology. Preceded in death by his wife, Mary, Dr. Healey is

survived by three daughters, three sons, and nine grandchildren.

John H. Phillips, a retired hematologist-oncologist and former member of the clinical faculty in the Department of Medicine at Washington State University, died July 15, 2014. A former director of medical education at Deaconess Hospital in Spokane, Wash., past president of the Spokane unit of the American Cancer Society, and former

president of the Spokane Society of Internal Medicine, he retired after many years of private practice to live and work on a sailboat, spending half of his year in Mexico and the other half in New Mexico. Dr. Phillips served as a captain in the U.S. Army Medical Corps. He is survived by his wife, Margaret, four children, and five grandchildren.

Robert T. Pottenger, a retired allergist and immunologist, died May 2, 2014.

He served in the U.S. Air Force and pursued a private allergy practice for more than three decades in Pasadena, Calif., before retiring to Minden, Nev. He was preceded in death by his wife, Ann, and is survived by seven children and 13 grandchildren.

Herbert Wohl, a retired hematologist-oncologist and former member of the Department of Medicine faculty at UCLA, died Sept. 23, 2014, of

Waldenstrom's macroglobulinemia. He was 86. He served for many years as chief of hematology/oncology at La Jolla VA Hospital in La Jolla, Calif. Survivors include his wife, Audrey, two daughters, and a son.

1955

Peter D. Westerhoff, a retired otolaryngologist, died July 8, 2014. He was 88. He served in the 45th Division of the U.S. Army's 157th Regiment during

Remembering Ernie

By Robert Osnos '56

During Ernest M. Vandeweghe Jr.'s years as a medical student at P&S, as a pediatric intern at Bellevue, and as a pediatric resident at Babies Hospital, he was a key player for the New York Knicks. The Knicks reached the NBA finals three times during these years.

When I was a first-year student at P&S, in 1952-53, my fellow students and I were all aware of Ernie's double life as a medical student and professional basketball star. He did not play in out-of-town games during the week, but for home games he had to get to Madison Square Garden after a full day of classes, once or twice most weeks. What did he do if a class continued after 5 p.m.? He never did leave early. Instead he walked into Madison Square Garden as he was tying his sneakers then warmed up by running behind the Knicks bench.

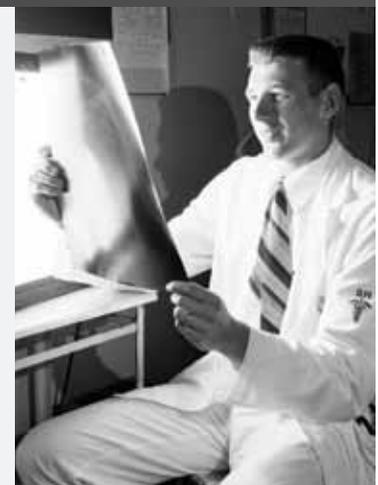
When Ernie came back to Babies Hospital as a resident in 1954 he was married to Miss America of 1952, Colleen Kay Hutchins, whose brother Mel was also an NBA star. When she came to the medical center to visit, they ate in the cafeteria, sitting in a corner. Everyone made an effort not to obviously stare at the striking young couple.

I was fortunate during my senior month in Babies Hospital to have Ernie as my resident. We had a 3-year-old patient with tuberculous meningitis. She was

doing very well but required a spinal tap every month. Ernie wrapped himself around her as I did the tap. She was still a moving target and I asked him, "You can stop Dolph Schayes [a great NBA center]. Why can't you control her?" "With Dolph," he replied, "there is something substantial to grab!"

My big moment during the month was to present a patient at rounds, probably to Dr. Rustin McIntosh, chairman of pediatrics. Ernie selected the patient, a boy with Down syndrome, and gave me several articles to read. For two hours he rehearsed me for the 5-10 minute presentation and prepared me for all the questions I could be asked.

Many people remember Ernie Vandeweghe, the pro basketball player, but I feel grateful to have had him as a great teacher during my medical school years.



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World War II, earning a Bronze Star. Dr. Westerhoff took over his father's family practice in Midland Park, N.J., and spent more than two decades in the practice before joining the medical department at IBM in Franklin Lakes, N.J. Preceded in death by his first wife, Helen, and his second wife, Delia, he is survived by six children, 12 grandchildren, and seven great-grandchildren.

1956

Ralph L. Gentile, a retired surgeon, died Jan. 3, 2015. He pursued a private surgical practice for more than 50 years in the Bronx. He was a former governor of the American College of Surgeons. Preceded in death by his wife, Teresa, he is survived by a daughter, two sons, and four grandchildren.

Robert L. Goodale, a retired surgeon and pioneer in minimally invasive surgical procedures, died of cancer July 17, 2014. He was 84. Dr. Goodale, who also held a PhD degree in physiology from the University of Minnesota, was the founding director of the University of Minnesota's Department of Endoscopy and helped introduce laparoscopic technology

for surgery. Also a philanthropist, Dr. Goodale and his wife, Katherine, who survives him, endowed a chair in minimally invasive surgery at the University of Minnesota and also contributed to the arts. His honors included the H. Diehl Award and Surgical Alumnus of the Year Award from the University of Minnesota. He is also survived by three daughters and a son.

Jaroslav F. "Jerry" Hulka, a retired obstetrician/gynecologist, died Nov. 24, 2014, at age 84. He was a member of the faculty of the medical school and the public health school at the University of North Carolina in Chapel Hill, and he also pursued research at the Carolina Population Center. A past president of the American Association of Gynecological Laparoscopists and chair of the National Medical Committee of the Planned Parenthood Federation of America, Dr. Hulka is best known for having developed the Hulka Clip, a safe form of birth control used by millions of women, and for initiating the use of laparoscopy at UNC. He wrote "Textbook of Laparoscopy," issued in three editions. Also an

accomplished musician, he played French horn in the Doctors Orchestra in New York, McKeesport Orchestra in Pennsylvania, and the Village Orchestra, later renamed Chapel Hill Philharmonia. Survivors include his wife, Barbara, a daughter, two sons, and seven grandchildren.

1957

Richard W. Hyde, a pulmonologist, died Oct. 30, 2014, at age 85. He served as a sergeant in the U.S. Army during the Korean conflict. Dr. Hyde was a professor of medicine at the University of Rochester. Also interested in architecture, he and his wife, Susan, who survives him, renovated three homes, including an early Italianate Victorian in Philadelphia, a Federal in Scottsville, and an 18th-century cottage in Kittery, Maine. The couple also raised Labrador retrievers. Other survivors include a daughter, three sons, and six grandchildren.

John C. Rathe, a retired radiologist, died Dec. 4, 2014. Dr. Rathe co-founded Moline X-Ray, a group practice, and was a member and past president of the staff at Lutheran Hospital in Iowa

City. A pilot in his free time, he held twin engine and instrument ratings. After his retirement he volunteered with Habitat for Humanity. Preceded in death by his wife, Fern, he is survived by a daughter, three sons, and seven grandchildren.

1958

Brown W. Dennis, a retired endocrinologist, died Dec. 30, 2014. Following his military service as chief of medicine at McDonald Army Hospital in St. Eustis, Va., he pursued a private practice in endocrinology for more than 50 years, maintaining an affiliation with Piedmont Hospital in Atlanta. Dr. Dennis volunteered with the Salvation Army and the Presbyterian World Mission Board as a medical consultant for missionaries. Among many other honors, he received the 11 Alive Community Service Award, the Institute for Public Service Thomas Jefferson Award, the Medical Association of Atlanta Aven Cup, the Piedmont Hospital Nicholas E. Davies Community Service Award, and the Salvation Army Exceptional Service Award. After retiring from practice, he volunteered at Salvation Army Clinics and



Robert L. Goodale '56

the Free Clinic of the Community Helping Place in Dahlonega, Ga. Survivors include his wife, Jean, two daughters, a son, and nine grandchildren.

Norman L. Kaplan died Nov. 14, 2014. He established a private psychiatric practice in Manhattan in 1963, practicing for more than 40 years. He also served as assistant professor of psychiatry at Albert Einstein College of Medicine, assistant clinical professor of psychiatry at Weill Cornell Medical College, and assistant attending psychiatrist at the Payne Whitney Clinic. He is survived by his wife, Suzanne, and three daughters.

1959

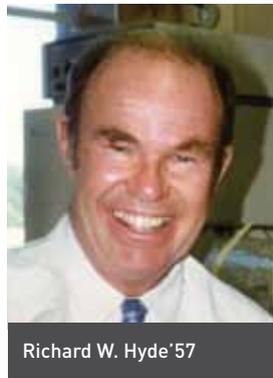
Frederick A. London, a retired internist, died Dec. 3, 2011. He was passionate about literature, music, and theater. He worked for much of his career with Kaiser Permanente. He is survived by his wife, Trudy, a daughter, and a son.

1960

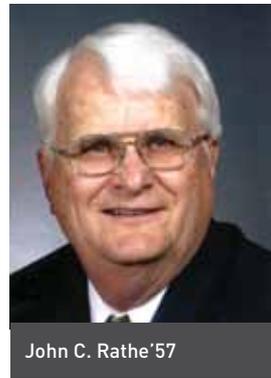
Walter H. Glinsmann, a retired endocrinologist, died Nov. 21, 2014. He did his military service and training in endocrinology and metabolism at Walter Reed Army Medical



Jaroslav F. Hulka '56



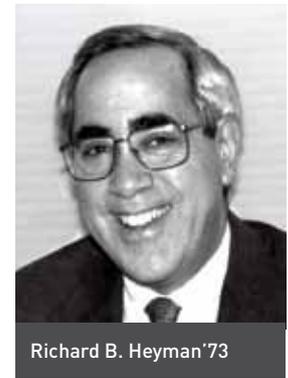
Richard W. Hyde '57



John C. Rathe '57



Brown W. Dennis '58



Richard B. Heyman '73

Center. For many years he officiated as chief of the Section on Physiological Controls at the National Institute of Child Health and Human Development at the NIH. He subsequently served at the FDA's Center for Food Safety and Applied Nutrition, advancing to associate director for clinical nutrition. Dr. Glinsmann also worked for the Office of Disease Prevention and Health Promotion and the Assistant Secretary for Health in the Department of Health and Human Services. Later in his career he founded Glinsmann Inc., applying his expertise as a consultant in evaluating the safety of foods, the development of nutritional products, and food-related claims. In 2002 he was inducted as a Fellow of the American Society for Nutrition. He is survived by his wife, Patsy, two daughters, two sons, and six grandchildren.

1962

John P. Grant, a retired urologist in private practice for more than four decades, died September 15, 2014. He served in the U.S. Marine Corps. Dr. Grant was a member of the surgical team that performed the first renal transplant

at Presbyterian Hospital, now NewYork-Presbyterian Hospital/Columbia. He volunteered throughout the course of his career at the Hôpital Albert Schweizer in Deschappelles, Haiti. Survivors include his wife, Jane, four children, and 13 grandchildren.

1970

Daniel H. Carmichael, a retired surgeon, died of cancer Dec. 11, 2014. Dr. Carmichael served in the U.S. Army Medical Corps, then moved to Oklahoma City to launch a private surgical practice. He was a principal investigator for the NSABP Study Group, served on the Breast Cancer Surgery Committee, and participated in a lumpectomy study that demonstrated the efficacy of breast-conserving surgery. He also served as medical director of AMCARE, an emergency medical care provider in central Oklahoma. Preceded in death by a son, he is survived by his wife, Walta, and two daughters.

Alan D. Tice, an internist and specialist in infectious diseases, died of cancer March 30, 2013. He helped organize the first Infectious Diseases Society of America clinical conference in 1990

and served as the society's delegate to the American Medical Association House of Delegates. The society honored him in 1996 with its Clinician of the Year Award and in 2012 with the IDSA Society Citation. He was also a founder, then president, of the Infectious Diseases Society of Washington. After 20 years of pursuing a private practice in infectious diseases in Tacoma, Wash., a practice that grew to comprise a dozen physicians, a laboratory, pharmacy, and outpatient infusion services, Dr. Tice moved to Hawaii, where he founded Infections Limited Hawaii. In a reminiscence, a colleague, Dr. Dominic Chow, recalled of his friend: "He would find ways to get his homeless patients medications and champion their desire to find a successful cure for their infections." He taught on the faculty of the John A. Burns School of Medicine of the University of Hawaii, where he researched staphylococci in the ocean and their role in human infections. He also served as director of Access Care Today, a nonprofit organization supporting education and research in staphylococcal infections, viral hepatitis, outpatient parenteral antibiotic

therapy, and patient access to medical care. He was the author of more than 80 peer-reviewed articles. He is survived by his wife, Constance, a daughter, and two sons.

1973

Richard B. Heyman, a pediatrician specializing in adolescent medicine and past president of the Cincinnati Pediatric Society, died of nonsmoker's lung disease Aug. 13, 2014. Dr. Heyman served a term as chairman of the Committee on Substance Abuse of the American Academy of Pediatrics, which honored him with the Adele Dellenbaugh Hofmann Award. He served as a key advocate on former Surgeon General C. Everett Koop's Advisory Committee on Tobacco Policy and Public Health and helped develop public health recommendations concerning the future of tobacco policy. In his free time Dr. Heyman loved classical music and opera and served on the Board of Directors of the Hilton Head Symphony Orchestra. He is survived by his wife, Elizabeth, three sons, and eight grandchildren. The AAP Founders of Adolescent Health Award will be renamed the Richard B.

Heyman Award in his memory.

1982

Joseph A. Vita, a professor of medicine at Boston University School of Medicine, senior staff cardiologist at Boston Medical Center, and founding editor of the Journal of the American Heart Association, died of lung cancer Nov. 2, 2014. He was 58. Dr. Vita's research focused on the causes of arterial blockage and heart attack. American Heart Association president Elliott M. Antman '74 saluted him as "the quintessential scientist." He had previously served as chief of medical services at the VA Boston Healthcare System. He was the author or co-author of more than 200 peer-reviewed articles. A committed educator, Dr. Vita was one of the first recipients of the Robert Dawson Evans Research Mentorship Award. In his free time he loved to sail on the family boat, La Bella Vita. He is survived by his wife, Gina, a daughter, and a son.

Other alumni deaths

Abraham Horvitz '36
James S. Marshall III '48
G. Douglas Talbott '49
Clark Collins '51
Joseph E. Mackie '54
Martin Wohl '57

Bard Hall Players



The Bard Hall Players cast during the curtain call for "The Music Man."

PHOTO BY MICHAEL HERNANDEZ '17

"The Music Man"

The Bard Hall Players, the theater troupe in residence at P&S, have been staging musicals and plays on campus for more than 50 years. In November 2014, the ensemble was proud to present its production of "The Music Man," Meredith Wilson's American classic about a sleepy and stubborn Iowa town brought to life by the gilded promises of a traveling salesman.

Directed by Jennifer Russo '16, the Bard Hall Players featured the singing, acting, dancing, instrumental, and staging talents of students from P&S, the School of Nursing, Mailman School of Public Health, the College of Dental Medicine, and the

Graduate School of the Arts and Sciences, drawing in nearly 600 fans for four performances. Faculty critics weighed in, with the consensus that "The Music Man" was among the very best Bard Hall Players productions in memory, a tribute to the hard work and innate talent of our many performers.

Other Bard Hall Players productions in 2014 were William Shakespeare's "Julius Caesar" and Tom Stoppard's "Rosencrantz and Guildenstern Are Dead," under the production leadership of Lia Boyle '17, Sarah Gumlak '17, Lisa Mack '17, and Jessica Means '17.

— David Chapel '15

“The Tempest”

The Bard Hall Players presented William Shakespeare’s “The Tempest” March 12-14. Samuel Bruce’18, co-president of the Bard Hall Players, says a makeup workshop was held a few weeks before the performance because “a number of characters have very involved makeup for the show.”

La’Shay Morris, a Mailman School of Public Health student, was makeup maestro.



MICHAEL ANDREW PHOTOGRAPHY



1: Aili Klein, a first-year MD/PhD student, and graduate student Stephen Flaherty

2: Mikey Montalbano’18, BHP co-president, portrayed the spirit Ariel in the production.

3: From left: Jemma Benson’18; Natasha Spottiswoode’18; Mikey Montalbano’18; Lisa Grossman, an MD/PhD student; Nicole Curatola’18; Kristin Kunkle, a postdoc clinical fellow in psychiatry; and Mailman students Christiane Ochoa, La’Shay S. Morris, and Yao Ma





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Match 2015

"I'm a nontraditional student. I spent time in law school before medical school and I worked as a lawyer. I started medical school at 30, got married during med school, had my first daughter during med school.

"I'm going to Minnesota for urology. I matched back in January. Urology and ophthalmology match early, so we don't necessarily get to participate in the ceremony everyone else has.

"I sat on my couch alone and opened an email that said, 'You're moving to Minnesota for the next five years.' It's definitely different for me, but I've enjoyed the last few months. It was nice being relaxed and watching my friends and classmates prepare to find out where they're going to spend their time. It's a nice way to go through the process."

— Adam De Fazio'15



More about Match Day online at
bit.ly/2015PSMatch

Although Adam De Fazio knew in January that he matched to a urology residency in Minnesota, he and his family (wife Michelle and daughter Azzurra) joined his classmates on Match Day in March to share in the celebration.