

weillcornellmedicine

VOLUME 17, NUMBER 1

Creative Work

Shahin Rafii, MD, and his lab have made dramatic advances in the quest to generate blood stem cells



Weill Cornell Medicine

Reunion2018

Save the Date
October 5-6

The **Weill Cornell Medical College Alumni Reunion** will take place from **Friday, October 5 through Saturday, October 6**, offering engaging guest speakers, institutional updates and tours, class get-togethers, a gala dinner dance, and opportunities to mingle and network with old friends.

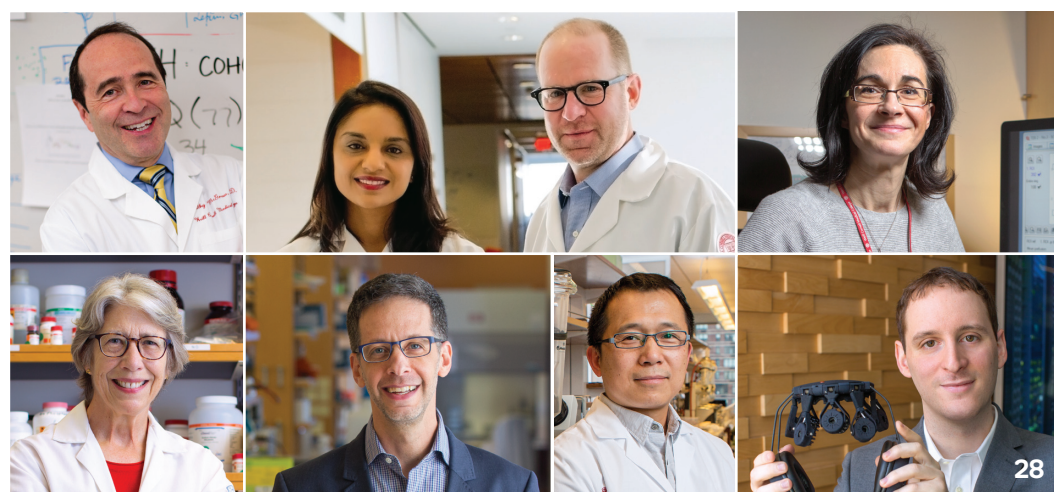
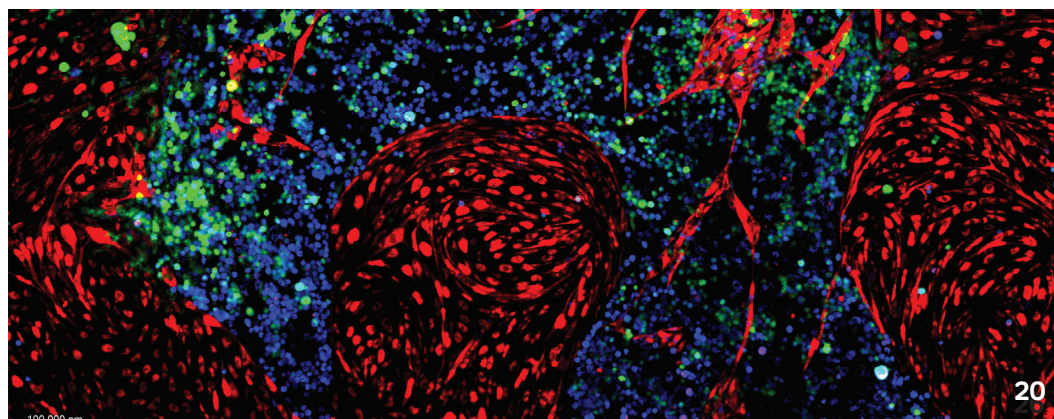
While class years ending in **'2, '3, '7, and '8** are celebrating milestone reunions, all alumni are invited back to campus to commemorate another year since graduation.



We hope to see you there!

Visit www.weill.cornell.edu/alumni/reunion for updates.

THE MAGAZINE OF
WEILL CORNELL MEDICINE
VOLUME 17, NUMBER 1



FEATURES

20 THE GIFT OF LIFE: THE QUEST TO GENERATE BLOOD STEM CELLS

JOHN HUBBELL

For two decades, Shahin Rafii, MD, has held to the lonely notion that stem cells could be coaxed into generating human blood cells—and in turn, fight disease. Rafii, an Iranian immigrant who earned an undergraduate degree from the Ithaca campus, has worked tirelessly toward that goal. And in recent years, his lab has made some striking breakthroughs. As one colleague put it after Rafii published a landmark paper in May 2017: “A lot of people have become jaded, saying that these cells don’t exist in nature and you can’t just push them into becoming anything else. I hoped the critics were wrong, and now I know they were.”

28 THE ENTREPRENEURS: NURTURING A CULTURE OF INNOVATION AT WCM

BETH SAULNIER

“For the first time,” says Dean Augustine M.K. Choi, MD, “there is a fully funded, fully staffed, unbroken pathway from an idea in a professor’s head to proving it works in people.” That vital pathway has been formed by several flagship programs that WCM has launched in recent years to foster entrepreneurship among faculty and students. Their common aim: to help ensure that promising ideas have the resources to be fully realized, and enabling researchers to more quickly transform their discoveries into new therapies and devices to benefit patients. “The world is waking up to this; it’s the hottest thing,” says Jessica Bibliowicz, chair of the Board of Overseers. “It’s very gratifying to see others embrace this model.”

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#WeAreWCM: A former Peace Corps volunteer, ophthalmologist Grace Sun, MD '05, is a passionate advocate for global health

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Augustine M.K. Choi, MD
Dean of Weill Cornell Medicine

Fostering Creativity in Medicine



While the effects of investing in this entrepreneurial ecosystem have already been far-reaching for our students and faculty, in the end our patients will be the true beneficiaries of this cultural shift.

A few months ago, I had the opportunity to speak to Weill Cornell Medicine students, faculty, and staff, along with our Board of Overseers, at my inaugural symposium on entrepreneurship and academic drug development. I was proud to introduce our incredible resources and a new suite of initiatives, meant to help our scientists translate their lab discoveries to the clinic. These programs—the BioPharma Alliances and Research Collaborations office, the Center for Technology Licensing, the Tri-Institutional Therapeutics Discovery Institute (Tri-I TDI), Bridge Medicines, the Daedalus Fund for Innovation, and the newly renamed BioVenture e-Lab—are united in their goal: to create an entrepreneurial ecosystem at Weill Cornell Medicine in which academic investigators can more easily build industry research alliances, form start-up companies, and advance their projects through the drug development process and into the commercial world.

In addition to introducing these initiatives and outlining their unique offerings, I also described why we're investing so heavily in entrepreneurship and cultivating an atmosphere where creativity in medicine is not only applauded, but fully supported. Research is, of course, a core component of our mission and one that we encourage in all its varieties, from basic to translational to clinical. But there is a bridge that must be crossed for any discovery to move from early-stage, foundational work to a clinical trial and the release of a new drug that benefits patients. It's in this space—that typically lasts more than ten years and costs more than a billion dollars—that we are targeting our entrepreneurial efforts.

Instead of watching the bulk of creative ideas fall into what's known as the "valley of death" when they don't get the industry or government funding required to help them advance, our entrepreneurial efforts are meant to circumvent roadblocks at every stage of the pipeline so that innovations get to patients more quickly. We're now educating students on the basics of

entrepreneurship and drug development from the start of their training; funding early-stage research projects with commercial potential; working directly with industry collaborators and investors to make sure those projects are advanced through the ranks; and providing opportunities for mentorship and support throughout. The result is that ideas that might once have been deemed too risky are pursued and supported through proof-of-concept studies, then brought to private investors or biotech companies that have already expressed an interest in partnering with academic investigators to pursue innovative ideas with commercial potential.

Recent successes that are a direct result of these changes are highlighted in our photo essay about our entrepreneurial ecosystem. There you'll meet eight investigators who have taken advantage of our new entrepreneurial offerings to advance their early-stage work further along the pipeline. Gang Lin, PhD, an associate professor of research in microbiology and immunology, is one of these investigators who used the springboard provided by our participation in the Tri-Institutional Therapeutics Discovery Institute and financial support provided by three Daedalus awards, which help early-stage projects achieve proof-of-concept results, to support several of his research projects. One of them, which focused on developing new drugs for diseases such as lupus—which affects more than a million Americans—attracted the attention of Allied-Bristol Life Sciences, and led to a licensing agreement to advance this work.

While the effects of investing in this entrepreneurial ecosystem have already been far-reaching for our students and faculty, in the end our patients will be the true beneficiaries of this cultural shift that has meant a renewed support of creative ideas. They will be the ones who receive better and more sophisticated clinical care thanks to breakthrough drugs, diagnostics, and devices. It could not be a more anticipatory moment—for all of us. ■

Maximizing Mentorship

At Weill Cornell Medicine's
Center for Global Health,
the spirit of mentorship
has thrived for four
generations.

Dr. Warren Johnson, the B.H. Kean Professor of Tropical Medicine in the Weill Department of Medicine and the Center's founding director, has had many mentees. But his relationship with Dr. Jean Pape (MD '75), the Howard and Carol Holtzmann Professor in Clinical Medicine and founder and director of GHESKIO, Weill Cornell's partner clinic in Haiti, has spanned nearly 40 years and created a remarkable success story surrounding global health.

In the late 1990s, Dr. Pape began mentoring an infectious diseases research fellow, Dr. Daniel Fitzgerald, who is now professor of medicine in the Weill Department of Medicine and recently succeeded Dr. Johnson as director of the Center for Global Health. Dr. Fitzgerald's fourth-generation mentee



Left to right: Drs. Jean Pape, Daniel Fitzgerald, Warren Johnson, and Jyoti Mathad

within the department – Dr. Jyoti Mathad (MS '12), assistant professor in the Weill Department of Medicine and co-founder of the Women in Global Health Research Initiative – collaborated with Drs. Fitzgerald, Pape, and Johnson through her global research on pregnant women with tuberculosis.

These mentor-mentee relationships evolved over time, providing support and guidance as the doctors' careers advanced. Their commitment to mutual success helped to foster a culture of excellence that has led the Center to become an inspiring example of Dean Augustine M.K. Choi's vision of mentorship at Weill Cornell.

"Our greatest resource is our community – the faculty, staff, trainees, and students who strive to share knowledge with one another," says Dean Choi, the Stephen and Suzanne Weiss Dean of Weill Cornell Medicine. Under his leadership, Weill Cornell plans to accelerate growth – and ensure that talented students and faculty achieve their full potential – by committing to a vigorous and dynamic culture of mentorship and dedicating funds to support those efforts.

'Our greatest resource is our community – the faculty, staff, trainees, and students who strive to share knowledge with one another.'

Dr. Augustine M.K. Choi
Stephen and Suzanne Weiss Dean,
Weill Cornell Medicine



To support critical faculty development initiatives at Weill Cornell Medicine, please contact: Lucille Ferraro, Director of Campaign Planning and Strategic Partnerships, at 646-962-9491 or luf2003@med.cornell.edu.

Hollenberg Named Chief of Medicine



ANTHONY HOLLENBERG, MD

Endocrinologist Anthony Hollenberg, MD, has been appointed chairman of the Joan and Sanford I. Weill Department of Medicine and physician-in-chief at NYP/Weill Cornell, effective February 1. He comes to Weill Cornell Medicine from Boston's Beth Israel Deaconess Medical Center—where he served as chief of the Division of Endocrinology, Diabetes, and Metabolism—and Harvard Medical School, where he was a professor of medicine. Hollenberg's predecessor as chairman, Dean Augustine M.K. Choi, MD, praised him as “an esteemed physician-scientist and educator and a proven leader,” adding that, “under his direction, the department will continue to cultivate and attract top talent in academic medicine and research, advancing our mission of scientific discovery and our world-class reputation for clinical, research, and educational excellence.”

A native of Toronto, Hollenberg earned a bachelor's degree in biochemical sciences from Harvard College and an MD from the University of Calgary. He is board certified in internal medicine and is a member of numerous professional organizations including the American Thyroid Association, the Endocrine Society, and the American Diabetes Association. He has published more than eighty original studies in leading journals, contributed twenty-five book chapters and reviews, and currently serves as associate editor of *Endocrinology*. His honors include the Van Meter Award from the American Thyroid Association and election to the American Association of Physicians.

With a particular interest in thyroid disorders, Hollenberg investigates the physiological and molecular underpinnings of metabolism; he focuses on understanding how thyroid hormones regulate metabolism and lipid levels as well as affect body weight. Additionally, his lab is developing protocols to create functioning thyroid tissue from embryonic stem cells. “The beauty of a department of medicine,” Hollenberg observes, “is that by providing such unparalleled care for a wide variety of people, both inside and outside the hospital, you really get to identify the major complex issues that need to be solved scientifically—from a policy level all the way down to an experiment in the lab.”

Choi Research Team Wins Major NIH Grant for Studies of Scar Tissue in Lung and Kidney

The husband-and-wife research team of pulmonologist Augustine M.K. Choi, MD, and nephrologist Mary Choi, MD, has received a major NIH grant that will provide more than \$2.1 million in funding over four years. The award, from the National Heart, Lung, and Blood Institute, will support their in-depth study of the mechanisms that cause scar tissue—known as fibrosis—to form in the lung and kidney. Using their combined expertise, the co-principal investigators will study the process that causes fibrosis, which can affect numerous organs and lead to progressive loss of tissue function and eventual organ failure. They will focus on a gene called RIPK3 and the role it plays in the development of lung and kidney fibrosis. They will also seek to uncover new biomarkers for disease severity and new molecular targets for diagnosing and treating patients. “Almost any chronic disease that progresses to an end stage, such as lung or kidney disease, leads to fibrosis that is ultimately responsible for organ failure,” says Mary Choi, professor of medicine. “Still, there are very limited treatment options specifically targeting this. So we want to address that by investigating what leads to progressive fibrosis in chronic disease.” In addition to serving as dean of WCM, Augustine Choi is a professor of medicine and of genetic medicine.

TIP OF THE CAP...

Jack Barchas, MD, the Barklie McKee Professor of Psychiatry and chairman of the department, who won the Mortimer J. Blumenthal Memorial Award from the UJA Federation of New York's Mental Health Professionals Division.

Diane Berson, MD, clinical associate professor of dermatology, elected to a four-year term on the board of the American Academy of Dermatology.

Leonard Girardi, MD '89, the O. Wayne Isom Professor of Cardiothoracic Surgery and chairman of the department, named a member of the American Surgical Association.

Fabrizio Michelassi, MD, the Lewis Atterbury Stimson Professor of Surgery and chairman of the department, winner of the Maurice R. Greenberg Distinguished Service Award, which honors a senior member of the NewYork-Presbyterian and Weill Cornell Medicine medical staff for exceptional and long-standing service.

Virginia Pascual, MD, the Drukier Director of the Gale and Ira Drukier Institute for Children's Health, awarded the Lupus Insight Prize from the Lupus Research Alliance.

Joel Stein, MD, a professor of rehabilitation medicine and chairman of the department, who won the C. Miller Fisher Neuroscience Vision Award from the American Heart Association and American Stroke Association.

Jessica Tyler, PhD, professor of pathology and laboratory medicine, elected a fellow of the American Association for the Advancement of Science.

PHOTO: ARAM BOGHOSIAN



SAID IBRAHIM, MD

Healthcare Equity Expert Leads New Division

The newly established Division of Healthcare Delivery Science and Innovation has named its inaugural chief: Said Ibrahim, MD, a leading physician-scientist whose research focuses on healthcare disparities. The division is housed in the Department of Healthcare Policy and Research, of which Ibrahim will also serve as vice chair for development and strategy. "I'm very interested in where research and health equity meet healthcare innovation and technology, and I feel that these new roles will really put me at the center of that interface," Ibrahim says. "What I hope to bring to Weill Cornell Medicine is the vision, advocacy, and desire to promote a scientifically sound mission to advance both healthcare quality and equity. Healthcare is rapidly changing, and I want to ensure that everyone benefits from that change." Ibrahim was recruited to WCM from the University of Pennsylvania's Perelman School of Medicine. He holds an MD from Case Western Reserve University, a master's in public health from Harvard, and an MBA from MIT's Sloan School of Management. His research includes studying racial disparities in healthcare, including exploring the lower preference for surgery among minority patients—work that has informed national policy at the Centers for Medicare and Medicaid Services.



REPORTING LIVE: As part of the Science and Society lecture series sponsored by the Graduate School of Medical Sciences, Dan Childs, managing editor of ABC News's medical unit, spoke on campus in October about the role of journalists in informing the public about clinical advances. He emphasized the need for journalists—whom he called the "tour guides" of information who often have to compress technical language into brief text or video—to deepen their knowledge of science. He noted that in an age where information is abundant but evidence-based research is devalued, it's vital for scientists and journalists to work in concert.

PHOTOS: IBRAHIM, UPENN; TRAUBE, TRAVIS CURRY; CHILDS, MANSURA KHANAM; BLANCHARD, STUDIO BROOKE

FROM THE BENCH

Signaling Pathway Contributes to Cancers

WCM researchers have discovered a cellular signaling pathway that regulates fat production and could become a target for cancer drugs. The pathway employs an enzyme called SRPK2, which had previously been little understood. "This SRPK2 pathway is likely to be overactive in many cancers where reprogramming of metabolism to promote cell growth and survival is commonly observed," says principal investigator John Blenis, PhD, the Anna-Maria and Stephen Kellen Professor of Cancer Research, a professor of pharmacology, and a member of the Sandra and Edward Meyer Cancer Center. The work was published in *Cell*.

Screen Pediatric Cancer Patients for Delirium



CHANI TRAUBE, MD

Delirium is common enough among children hospitalized with cancer—affecting nearly one in five—that they should be screened for it, reports a study in the *Journal of Pediatrics*. Delirium is a mental state characterized by changes in alertness, cognition, or awareness that is associated with poor outcomes, prolonged hospital stays, and other ills. Lead author Chani Traube, MD, associate professor of clinical pediatrics and a pediatric intensivist at NYP Komansky Children's Hospital, found

that those at greatest risk included those who were younger than five, had an underlying brain tumor, or were recovering from surgery.

TB Treatment Alters Gut Microbes

In an article in *Scientific Reports*, researchers at WCM and Memorial Sloan Kettering Cancer Center say that antibiotics for tuberculosis dramatically reduce quantities of several bacteria associated with immune system functions—an effect that lasts at least a year. "This may explain why people who are cured of TB are susceptible to reinfection and may also be at higher risk of developing other diseases," says first author Matthew Whipperman, PhD, MS '17, a postdoc in the lab of senior co-author Michael Glickman, MD, professor of medicine.

Recording Protein Functions in Real Time



SCOTT BLANCHARD, PHD

Using techniques pioneered at WCM, scientists have captured the first video recordings of a protein whose function is essential to the deadly foodborne bacteria *Listeria monocytogenes*. The work represents an advance in observing complex proteins in action—and opens the door to detailed study of related human proteins essential for the function of muscle cells. "Our microscopes are now demonstrating the ability to look at these proteins in motion at faster and faster time resolutions

and at greater and greater spatial resolutions," says senior author Scott Blanchard, PhD, professor of physiology and biophysics. The work appeared in *Nature*.

Non-Chemo Drugs for Lymphoma Worth Study

In an editorial in *Blood*, WCM scientists argue that non-chemotherapy drugs can benefit many patients with mantle cell lymphoma (MCL), an incurable blood cancer—and that they deserve deeper study in clinical trials. Non-chemo drugs include those that target specific molecules in cancer cells or spur the immune system to fight malignancy, and they may be less toxic than older medications. "Chemotherapy can be incredibly effective, and we don't want to throw it out," says lead author Peter Martin, MD, an associate professor of medicine, chief of the Lymphoma Program at WCM, and an oncologist at NYP/Weill Cornell. "The idea is to use the best drugs in the best way possible."



'When we activated Astrid's first implant she was thrilled,' recalls her mother, Kimberley Chapman. 'She almost immediately started asking us, "I get two magic ears?" '

PHOTO:

Happy Sounds

Astrid was just eighteen months old when her parents realized that her speech was delayed: she babbled and responded to sound, but wasn't speaking or developing language as she should have. Despite speech therapy—and later a basic hearing test, which came back normal—Astrid's speech didn't improve. When one of her therapists suggested she see an ear, nose, and throat specialist, her parents brought her to Weill Cornell Medicine. She was ultimately diagnosed with auditory neuropathy, a hearing disorder in which sound enters the inner ear normally, but the transmission of signals from there to the brain is impaired. One of Astrid's doctors, Michelle Kraskin, AuD, an instructor of audiology in clinical otolaryngology, compares the condition to trying to hear while underwater, or listening to a radio station that goes in and out of range. The little girl could make out some of what was being said, but the rest was garbled.

Happily, though, there was a clear course of treatment: the implantation of cochlear devices in both ears. At WCM's and NYP's Cochlear Implant Center, director George Alexiades, MD, associate professor of clinical otolaryngology, suggested performing the procedures within six weeks of each another to minimize trauma. "When we activated Astrid's first implant she was thrilled," recalls her mother, Kimberley Chapman. "She almost immediately started asking us, 'I get two magic ears?'" Now six, Astrid has made major progress in her recovery. She can carry on full conversations and is excelling in first grade in a specialized program; this year, her parents plan to move her to a mainstream school. The implants, Chapman says, "just opened up the world to her. We're so grateful to science and to the doctors at Weill Cornell." ■

Pitch Perfect

Successful treatment for Crohn's disease let a young New Yorker pursue her Broadway dreams



Analise Scarpaci

Analise Scarpaci had just turned thirteen when she made her Broadway debut in the chorus of *A Christmas Story: The Musical* during the 2012 holiday season. Performing before packed houses on the venerable stage of the Lunt-Fontanne Theatre would be a thrill for any young actor—but for Scarpaci, it marked a milestone not only for her career but for her long-term health.

The Staten Island native had been auditioning seriously since age ten, when she signed with a professional manager; just a week later, she was struck by the first symptoms of inflammatory bowel disease (IBD) while away at summer camp. Her condition deteriorated: she'd have to go to the bathroom more than a dozen times per day, she suffered from abdominal pain and bloody diarrhea, and her growth was markedly stunted. A few months shy of her eleventh birthday, she stood four-foot-two and weighed just fifty-two pounds. "I was extremely thin and small—I was so tiny, I probably looked about seven, and I was really frail looking," says Scarpaci, now an eighteen-year-old freshman at Pace University. "I was so weak because I was losing all this blood. It was hard to go out on auditions and keep my energy up."

Scarpaci's parents took her to a physician in Brooklyn, who diagnosed her with a type of IBD called ulcerative colitis (UC). But when she didn't improve significantly after a year of treatment, they came to Robbyn Sockolow, MD, professor of clinical pediatrics at Weill Cornell Medicine, for a second opinion. Chief of the Division of Pediatric Gastroenterology and Nutrition at NYP/Weill Cornell and associate attending physician at its Komansky Children's Hospital, Sockolow is an expert in treating IBD and other gastrointestinal disorders in children. (Her clinical innovations include creating the "Jellybean Test," a method of making wireless capsule endoscopies more kid-friendly by having young patients swallow candies to get them accustomed to the camera, which is housed in a capsule the size of a jellybean.) As it happens, Sockolow's own daughter had been a child actor, so she was familiar with the profession's demands. "Analise was very tired—she had been going to the bathroom frequently and having abdominal pain—but you could tell that she was an incredibly lively young lady," Sockolow recalls of their first meeting. "She was interested in pursuing acting, singing, and dancing, and her parents asked me whether she would be

PHOTO: GABE TURIELLO

able to, and I didn't see any reason why she couldn't. My job was to make her feel better and get her in remission—to get her to the point where her dreams could come true.”

Sockolow suspected that Scarpaci had been misdiagnosed, since her stunted growth didn't jibe with ulcerative colitis; after additional testing she diagnosed her with Crohn's disease, a different type of IBD. In both diseases, the mucosa—the lining of the gastrointestinal tract—becomes inflamed, leading to many of the symptoms that Scarpaci suffered. But there are important differences between the two, such as the fact that while UC is limited to the colon and generally involves more superficial inflammation, Crohn's can affect the entire digestive tract and have more severe consequences for overall health. Indeed, by the time Scarpaci saw Sockolow, she had developed ulcers not only throughout her colon, but her stomach and esophagus as well. Once Sockolow identified Crohn's as the culprit, she put Scarpaci on a drug called infliximab (Remicade), which had been approved by the FDA for adults in the Nineties and for children in the mid-Aughts. “It has changed the landscape of treatment in patients with Crohn's disease,” says

Sockolow, who has served as a paid member of a speakers' bureau for Janssen Pharmaceutical Company, which makes Remicade. “Where before we had medications that could make you feel better or stop some of the inflammation, infliximab is revolutionary in that it can provide excellent mucosal healing in some patients. But as important, in children it can really help with growth impairment—so Analise was a perfect candidate for it.”

In addition to receiving the drug through intravenous infusion roughly every seven weeks, Scarpaci had to radically change her diet, cutting out all gluten and dairy. “That was the most difficult part, because back then restaurants didn't have all the gluten-free options, like pasta and pizza, that they do now,” she says. “I'd get upset because when my parents would want to eat out, I couldn't go

with them. And they'd end up staying home, but I didn't want to hold them back.” In less than a year, though, all of Scarpaci's symptoms abated, and by the time she debuted in *A Christmas Story* she was in remission. The following year she was cast in the Broadway hit *Matilda*, appearing in it for eighteen months. “It filled my heart with joy,” Sockolow says of seeing her patient perform in both shows. “I knew she was incredibly talented, but to witness it—to know how sick she was and then see how brilliant she was on Broadway—really brought tears to my eyes.”

Scarpaci has kept performing, recently starting a career as a singer-songwriter. Now a musical theater major at Pace, she's active in the Crohn's & Colitis Foundation, which named her the pedi-

‘I owe everything to Dr. Sockolow and her team,’ Scarpaci says. ‘As soon as I met her we had this instant connection. When I told her I wanted to be an actress she said, “Don’t let this stop you,” and I never did.’

atric honoree of its Staten Island benefit walk last summer; Scarpaci, who sang the National Anthem at the event, raised more than \$9,000 through her walking group, Broadway for Bellies. “I owe everything to Dr. Sockolow and her team,” she says. “They're the most amazing people and I have developed relationships with every one of them. As soon as I met her we had this instant connection. When I told her I wanted to be an actress she said, ‘Don't let this stop you,’ and I never did. That has always stuck with me.”

Since Crohn's disease currently has no cure, Scarpaci will have to maintain a restricted diet and have regular infusions for the foreseeable future. But those trips to the hospital—during which Sockolow checks on her medical progress—also offer the chance to catch up with the physician who has practically become family. “When I see her for the infusions, I'm not just having a visit with a patient, I'm having a day with the girls, if you will,” Sockolow says. “It takes five minutes for us to go through the medical questions, and the rest is about school, auditions, getting into college, family holidays, funny stories, girly things like clothes. All we do is laugh.” Scarpaci's recovery, Sockolow adds, is the kind of outcome that every physician hopes for. “You wish that you could take every patient who ever walked into your office and bring them back to a state of health—and not only that, but to the point that they only think about IBD on the day you see them,” she says. “The only time that Analise has to be reminded she has Crohn's disease is when she comes in for her infusion. Other than that, she's as healthy, happy, and free as any young person would be.” ■

—Beth Saulnier



‘A DAY WITH THE GIRLS’: Robbyn Sockolow, MD (left), catches up with longtime patient Analise Scarpaci during her regular infusion treatment for Crohn's disease.

PHOTO PROVIDED

Formative Experience

Microbiologist Joseph Heitman, MD '92, PhD, reflects on how working on Lasker Award-winning research as a postdoc changed his professional path

As a student in the Tri-Institutional MD-PhD program, Joseph Heitman, MD '92, PhD, was thrilled to be training as a physician-scientist—someone who would be, as he puts it, an “ambassador” to bridge the sometimes disparate worlds of medicine and basic research. Yet in 1989, with his doctoral work at The Rockefeller University complete and only about eighteen months to go at Weill Cornell Medical College, Heitman felt something was missing. So he requested a leave of absence to do a long-term fellowship at the Biozentrum of the University of Basel in Switzerland, one of the world's leading centers for molecular and biomedical research. “It was very unusual at the time,” Heitman says of the decision to allow him to pursue a different path so late in his studies. “It required both deans to agree, but they were highly supportive.”

As a postdoc in Basel, Heitman joined the laboratory of Michael Hall, PhD, a young, up-and-coming molecular biologist who'd recently started his own research team as an assistant professor at

the Biozentrum. There, Heitman spearheaded experiments that ultimately helped Hall figure out that a group of proteins called “target of rapamycin” (TOR) plays a central role in controlling cell growth—a finding that has implications for the treatment of cancer, diabetes, cardiovascular disease, and more. In 2017, nearly three decades later, this groundbreaking discovery earned Hall one of the most coveted prizes in medical science: the Albert Lasker Award for Basic Medical Research, an honor that has often presaged a Nobel.

Heitman says he's pleased that Hall was recognized for his pioneering work and that the Lasker Foundation noted his own contributions in the award citation. But he's always been most excited about the potential clinical applications of these findings to save lives or improve human health. Says Heitman, now chair of molecular genetics and microbiology at Duke University Medical Center: “Advancing medicine to do the greatest good—for me, that's the prize.”

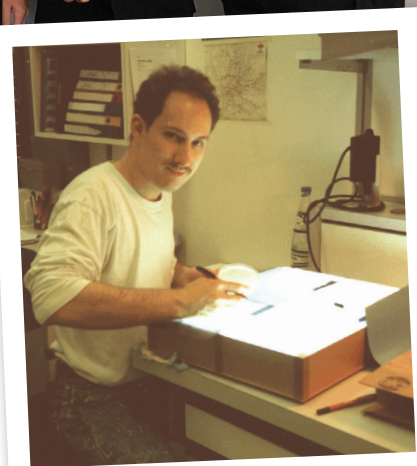
While in Hall's lab, Heitman was initially focused on a different project from the work that would lead to the Lasker breakthrough; he was studying how proteins are imported into a cell's nucleus, but soon realized that it wasn't yielding results. “Basically,” he says, “it was crashing and burning.” At the library one day, he came across a journal article describing how the drug cyclosporin could be studied in a fungus akin to yeast. Heitman knew about cyclosporin from his medical training; it was given to transplant patients to prevent organ rejection. There were also two experimental drugs in the pipeline with similar properties, including one called rapamycin. So Heitman asked Hall if he could change tracks and use yeast to examine this class of immunosuppressants.

Doctors knew that these drugs acted on specific cells in the immune system—but exactly how they worked was a mystery. And while today scientists recognize that yeast and other fungi are more closely related to animals than to plants, back then yeast was largely considered too different to use in drug research. “People thought this was completely heretical—that you would study an immune drug for humans in a model yeast system,” says Heitman. “You'd tell people what you were doing and they'd say, ‘That's the craziest thing I've ever heard.’” Yet William Holloman, PhD, a professor in Weill Cornell's Department of Microbiology and Immunology who taught Heitman in medical school, isn't surprised that his former student would embrace an unconventional approach. “Joe was always very curious,” says Holloman. “This certainly wasn't widely accepted at the time, so recognizing that there could be a translation was very insightful of him.”

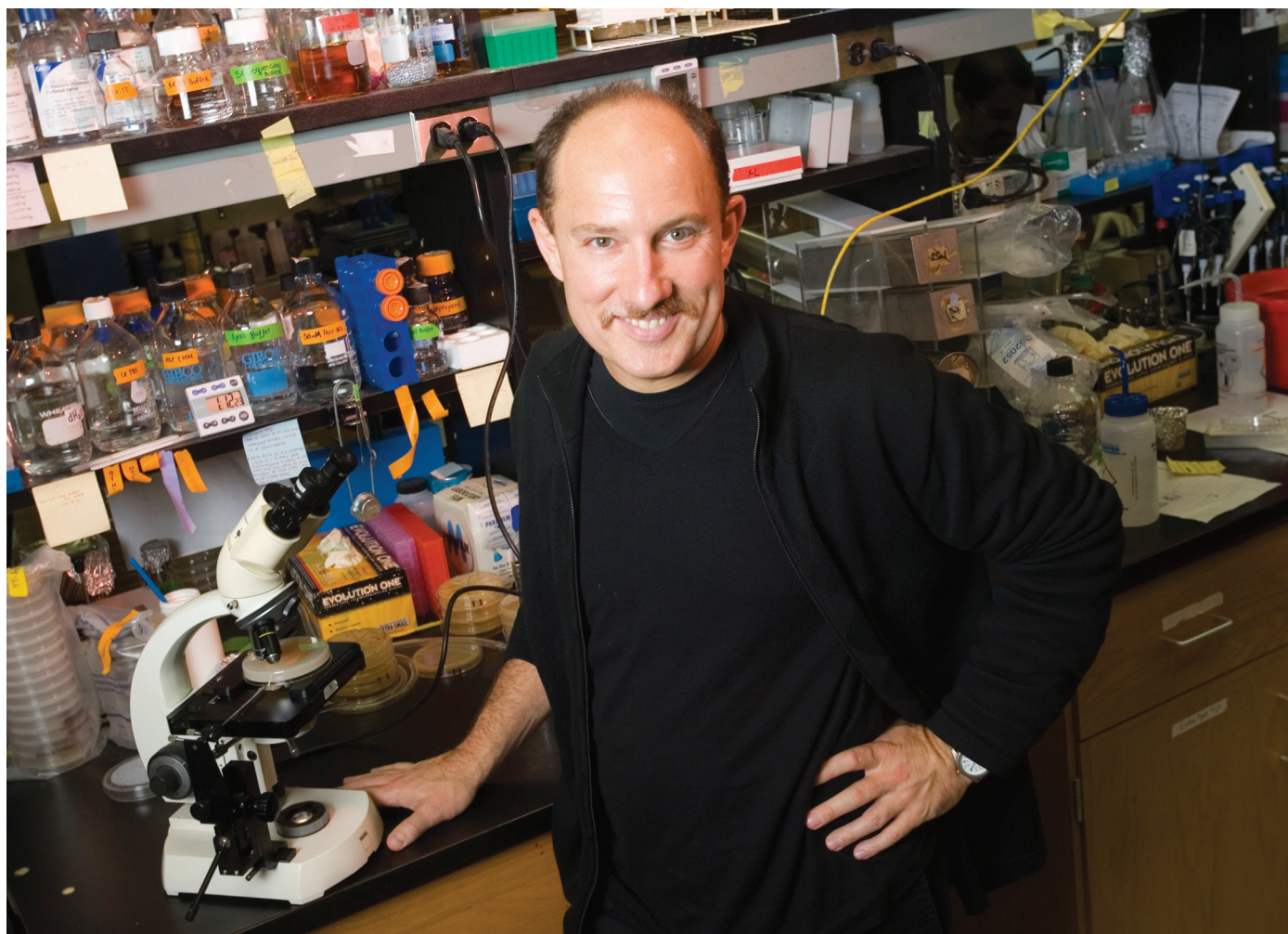
Hall, too, says he thought the idea was worth pursuing. He knew that Rao Movva, PhD, a scientist at nearby Sandoz Pharmaceuticals, was also doing work in this area and suggested that they collaborate. Studies by Heitman, Movva, and Hall uncovered two previously



HONOREES: Heitman (above center) at the Lasker Awards ceremony with former research collaborators Hall (left) and Movva. Right: In the lab in Basel in 1990. Opposite page: In his Duke lab today.



PHOTOS: PROVIDED



unknown proteins—named TOR1 and TOR2—and showed how they were crucial to rapamycin’s success in patients. “Joe was an outstanding, creative postdoc who initiated our rapamycin-related research,” says Hall, who remains on the Biozentrum faculty and has won numerous honors including the 2014 Breakthrough Prize in Life Sciences. “His seminal work was key in the elucidation of rapamycin action and the discovery of TOR—and, most importantly, led to a paradigm shift in how we think of cell growth.”

After Heitman returned to New York to complete his medical studies, Hall continued the research, eventually proving that TOR is a key in regulating cell growth. That knowledge upended a long-standing theory, since it had previously been assumed that there was no mechanism controlling the process. Now, scientists are using information about TOR to develop new interventions for an array of conditions; for instance, there are several TOR-related medications currently in use to prevent and treat organ and tissue rejection, to reduce the narrowing of blood vessels in cardiology patients, and as chemotherapeutic drugs for cancer. Plus, Heitman says, pre-clinical work is currently being done on TOR’s potential role in neurological diseases, vaccine effectiveness, aging, and metabolic disorders like diabetes.

For Heitman, the year and a half he spent in Basel changed his

career trajectory: he decided to forgo a medical residency and focus on research. At Duke since 1992, he has continued using yeast and other fungi to understand human ailments, most recently studying infectious disease in transplant patients and other immunocompromised people. He has received numerous honors over the years, including a MERIT award from the National Institute of Allergy and Infectious

According to Lasker winner Michael Hall, PhD, Heitman’s contributions ‘led to a paradigm shift in how we think of cell growth.’

Diseases and a Burroughs Wellcome Scholar Award in Molecular Pathogenic Mycology. An editor for several journals including *PLOS Genetics*, *Genetics*, and *PLOS Pathogens*, he is an elected fellow of such organizations as the American Society for Clinical Investigation, the American Academy of Microbiology, and the American Association for the Advancement of Science. “It’s not just an abstract business of solving scientific puzzles; what you do in biomedical research impacts real patients and real lives,” Heitman says. “And the sooner you get to those life-saving advances, the better.” ■

— Heather Salerno

World by the Tail

Pet therapy helped convince Sarah Caughey '21 that medicine was her calling



Walker Caughey has terrific bedside manner. Patients love him. And he looks adorable with a stethoscope—though with paws instead of fingers, it'd be tough for him to take a pulse.

Boasting silky fur and striking blue eyes, Walker is a three-year-old toy Australian shepherd who belongs to medical student Sarah Caughey '21. But he's not just a pet: in a way, he's a clinical colleague. For the past two years Walker has been a certified therapy dog, bringing comfort (and an impressive repertoire of tricks) to patients, staff, and families at medical facilities in three states. "Walker is so people-oriented—he loves to be social," says Caughey, an Ohio native who adopted him as a puppy when she was a senior at Dartmouth, both to be a pet and to serve as an emotional support animal (ESA) for anxiety related to her migraine headaches. "And he's very empathetic; he has a tendency to recognize when people are upset. So his whole demeanor is a good fit for pet therapy."

Caughey studied anthropology and environmental studies as an undergrad, and she'd initially planned on earning a graduate degree in a related field—but, she says, she ultimately decided that the world's pressing environmental problems rest more in the hands of politicians than researchers. Contemplating what she'd enjoyed about her thesis work—on how the decline of traditional spearfishing in the Dominican Republic has impacted community health—she realized that she craved a career in which she could "connect to people in a meaningful way and problem-solve in a team-based environment with tangible results." Medicine, the profession of her father and older sister, offered both.

She was drawn to pet therapy, she says, not only because she wanted to do volunteer work and thought Walker would be suited to it, but as a way to clarify her desire to pursue an MD. "It made me feel like my personality would fit well in a healthcare scenario—I became much more confident that this was something I could do," says Caughey. "It gave me an opportunity to become comfortable

PHOTO: TRAVIS CURRY



GOOD BOY: Walker giving Caughey a paw (left). Opposite page: The pair in matching garb after the 2017 White Coat Ceremony.

talking to patients, and it made me realize how important it is to connect with them as people first. It taught me valuable lessons about the kind of physician I want to be.”

Becoming a therapy dog doesn’t require any specialized training (and Walker’s volunteer work is unrelated to his status as an ESA). But he did have to pass a test that comprised basic obedience as well as some behavioral and temperament issues related to a medical environment. He had to demonstrate that he’d remain calm around equipment like wheelchairs and IV poles; that he wouldn’t be flustered by loud noises or heated arguments (since some patients might have cognitive issues); and that he would tolerate the kind of rough petting he might receive from kids or people with motor impairments. “Australian shepherds are a working breed, and pet therapy is a job to Walker for sure,” says Caughey. “It’s overstimulating in a good way—it makes him tired like nothing else can.”

At Dartmouth, Caughey and Walker made weekly appearances at the campus health and wellness center, where he’d hold “office hours,” offering stress relief for students who’d drop by and play with him. They also volunteered at Dartmouth-Hitchcock, the school’s teaching hospital, where they’d greet people at the front entrance and visit patients in the neurology ICU. While living in Baltimore to do her premedical coursework at Goucher College, Caughey brought Walker to Johns Hopkins, where their assignments included visiting the ICU, a pediatric ward, and people recovering from transplant surgery. At NewYork-Presbyterian/Weill Cornell, they’re making weekly visits to oncology floors. “Pet therapy offers a unique way

to connect to patients,” she says. “It allows them to be more vulnerable than they may be willing to be with a doctor. There’s so much anxiety and stress about being in a hospital setting, and Walker offers a different avenue for them to express that.”

In addition to letting patients and families play with and pet him, Walker entertains them with a variety of tricks. He knows “down,” “roll,” “spin,” “dance,” “shake a paw,” and—his big finish—“draw-bang,” in which he stands on his hind legs, keels over, and plays dead. He even has “business” cards bearing his photo that

‘Pet therapy offers a unique way to connect to patients,’ Caughey says. ‘It allows them to be more vulnerable than they may be willing to be with a doctor.’

Caughey hands out—and he’s the star of his own Instagram feed, @wild_wild_walker. “Growing up on a college campus, he’s used to having lots of attention,” she says. “He’s a complete ham.” As Caughey’s official ESA, Walker is considered a service dog and is allowed in public areas and housing. He lives with her in Olin Hall, and Caughey credits their daily rambles along the East River with forcing her to set aside time for herself amid the pressures of medical studies. “My classmates constantly ask if they can babysit him, so it’s definitely an ‘it takes a village’ mentality,” she says. “He’s great stress relief for everyone.” ■

— Beth Saulnier

Prescriptive Measures

Can drug databases help curb the opioid epidemic?



Drug overdoses took the lives of some 64,000 Americans in 2016, a 22 percent rise over the previous year. The majority of these deaths were linked to opioids—including heroin, prescription painkillers, and the powerful synthetic drug fentanyl—which together killed more people than gun violence or even car accidents. The growing crisis has alarmed officials at the highest levels, and in October, President Donald Trump directed the Department of Health and Human Services to declare the nationwide epidemic of opioid abuse a public health emergency. “It is a huge problem,” says Jonathan Avery, MD, an assistant professor of clinical psychiatry at Weill Cornell Medicine and an assistant attending physician at NYP/Weill Cornell, where he serves as director of addiction psychiatry. “When I started here in 2009, it wasn’t even on many doctors’ radar.” In recent years, however, New York City has seen a staggering number of fatal overdoses—nearly 1,400

in 2016, a 46 percent increase over the previous year, according to the city’s health department. Says Avery: “We’re seeing a lot of death everywhere.”

Solutions have remained elusive, but according to WCM researchers, one of the most effective ways to prevent overdoses may be as simple as keeping better track of prescriptions. People who have developed opioid use disorders—or are illicitly sharing pills with others—often go to several doctors, either to get multiple prescriptions of the powerful painkillers or to get a new prescription after being refused a refill. “Historically,” Avery says, “there was no way for a physician to check to see if a patient had a history of being on the medication or was actively getting it from someone else.” While some doctors may unscrupulously prescribe inappropriate drugs for profit, many well-intentioned practitioners are simply unaware that their patients have been prescribed opioids by another clinician.

PHOTO: SMARTSTOCK/ISTOCK

But according to Yuhua Bao, PhD, associate professor of healthcare policy and research, that is changing thanks to the advent of prescription drug monitoring programs. With these statewide online databases, pharmacies are required to log each opioid prescription they fill, and physicians and pharmacists can check whether a particular patient has already been prescribed one by another practitioner. Forty-nine states (all except Missouri) and the District of Columbia now have such programs—up from eleven in 2003, the year the federal government began offering grants to fund them.

Bao has spent the past few years studying the effectiveness of these programs. In 2016, she led a team that found that when a state creates one, it lowers the likelihood that a pain patient will be prescribed Schedule II opioids (a category that includes Percocet and OxyContin) by 30 percent—a result that Avery, who was not involved with Bao's study, says demonstrates their "huge" potential to curb addiction. While it's not clear that all the eliminated prescriptions would have been unnecessary, Bao says, it does indicate that monitoring programs make doctors more circumspect about prescribing the most addictive drugs. "We found the effect of a state implementing a monitoring program to be immediate," Bao says of the work, published in 2016 in the journal *Health Affairs*. "It might be because of rising awareness of an opioid misuse problem, or because physicians feel like they're being watched."

In some states, physicians' use of databases is voluntary, while in others doctors have a legal obligation to at least register with the system. In a 2017 study, also published in *Health Affairs*, Bao and colleagues reported that the requirement simply to register can trigger a drop of as much as 10 percent in the number of opioid prescriptions filled by Medicaid patients—presumably by raising physicians' awareness of the monitoring system and the potential for drug misuse.

That 2017 study relied on 2011–14 data from the Centers for Medicare and Medicaid Services, which covers a population that is especially vulnerable to opioid misuse and overdose. The reasons for this are complex, but one is that lower-income people often work physical jobs that are more likely to cause injury, which in turn can lead to chronic pain conditions for which doctors may prescribe opioids. Once Medicaid patients receive a prescription for opioids, they may also be more likely to misuse them, a risk factor linked to the tendency of less affluent people to suffer from more life stressors.

Some of Bao's future work on drug monitoring programs will involve exploring their potential pitfalls. These include the worry that if doctors fear they'll face

negative consequences for prescribing opioids even if patients genuinely need them, they may opt not to prescribe them at all; also, limiting access to prescription opioids may lead individuals to turn to even more dangerous street drugs, including heroin and fentanyl. Bao will also study ways to make monitoring programs more effective, including by sharing data across state lines. "This is especially salient to places like New York City," she explains, "where you may also have patients from New Jersey or Connecticut." And she notes that in addition to saving lives, databases could also reduce costs: the 2017 study found that if every state mandated that prescribers register with the system, Medicaid would save more than \$166 million a year. ■

—Amy Crawford



'We found the effect of a state implementing a monitoring program to be immediate,' says Yuhua Bao, PhD. 'It might be because of rising awareness of an opioid misuse problem, or because physicians feel like they're being watched.'

Poetry in Motion

A former professional dancer, immunologist Virginia Pedicord, PhD '10, aims to balance art and science

Some students enter the Weill Cornell Graduate School of Medical Sciences straight from undergrad; others spend a few years working in a lab before applying to master's or doctoral programs. But it's safe to say that few, if any, have taken the same route as Virginia Pedicord, PhD '10—a path traced by dramatic, rhythmic steps set to music.

Before matriculating at the graduate school, Pedicord was a professional dancer in New York City, primarily performing with two contemporary dance companies. During her PhD studies in immunology and microbial pathogenesis, she set her creative pursuits aside—but over the past five years, while doing a postdoc at The Rockefeller University, she has managed to balance art and science by taking regular dance classes and performing in occasional shows. “Having a creative outlet and being able to step away from the lab really reinvigorates you,” she says. “When you're able to think in

a different way for a couple of hours, you can come back to the question or problem with a bit of a different perspective.”

Pedicord's holistic view has been more than vindicated: in early 2018, she moved to the UK to start her own lab at the University of Cambridge, supported by a five-year grant of about \$1.6 million from the Wellcome Trust. There, she'll continue her research on the mechanisms by which the everyday bacteria residing in the human gut help protect against dangerous intestinal pathogens such as *Salmonella* and *Clostridium difficile*. She'll also continue dancing, taking classes in Cambridge and London. “There are people who are more the stereotypical performing artist—those who love to be onstage and are very ethereal, emotional, and expressive,” Pedicord observes. “At some level I'm those things too, but I have another side that really wants rational thinking, factual information, and empirical evidence.”

A Texas native, Pedicord came to dance relatively late in life. Although she was always interested in it—“I would dance around the living room when I was a kid, even though I didn't know what I was doing”—her family couldn't afford lessons. But after performing in a production of *Oklahoma!* her junior year of high school, the dance bug bit her hard, and she funded her own ballet and jazz classes with money earned by babysitting. As an undergrad at Minnesota's Carleton College, Pedicord studied both biology and contemporary dance with equal fervor. “College is a time when you don't have to choose,” she says, “which is fantastic.” Faced with the choice of which to pursue after her graduation in 1999, Pedicord opted for the artistic route. “Carleton is intense and academically rigorous, so I was happy to take a bit of a break from science,” she explains. “And I knew that if I wanted to explore how far I could go as a dancer, my body wouldn't let me do it later in life. It wasn't even a struggle, because the decision seemed clear.”

Pedicord danced professionally for five years, supplementing her income by bartending and teaching exercise classes. Among her higher-profile performances was a playful 2003 piece entitled “Gophoria,” in which she was one of a quintet of women channeling frolicsome woodland animals; a *New York Times* critic praised the piece, part of a show of one choreographer's work at a theater in Manhattan's Morningside Heights neighborhood, as “a syncopated, uninhibited romp danced with infectious comic abandon.” Eventually, though, the lure of the lab was too strong. “I missed it a lot, and there's only so much you can get out of reading pop science articles,” she says. “I missed having a question to investigate and answer. So as time went on, I realized that although I loved dancing, I didn't feel a strong need to do it as my career, and I felt drawn to come back and do my PhD.”

Her next step, of course, was to apply to programs—but Pedicord found that at most institutions, her time away from academia was

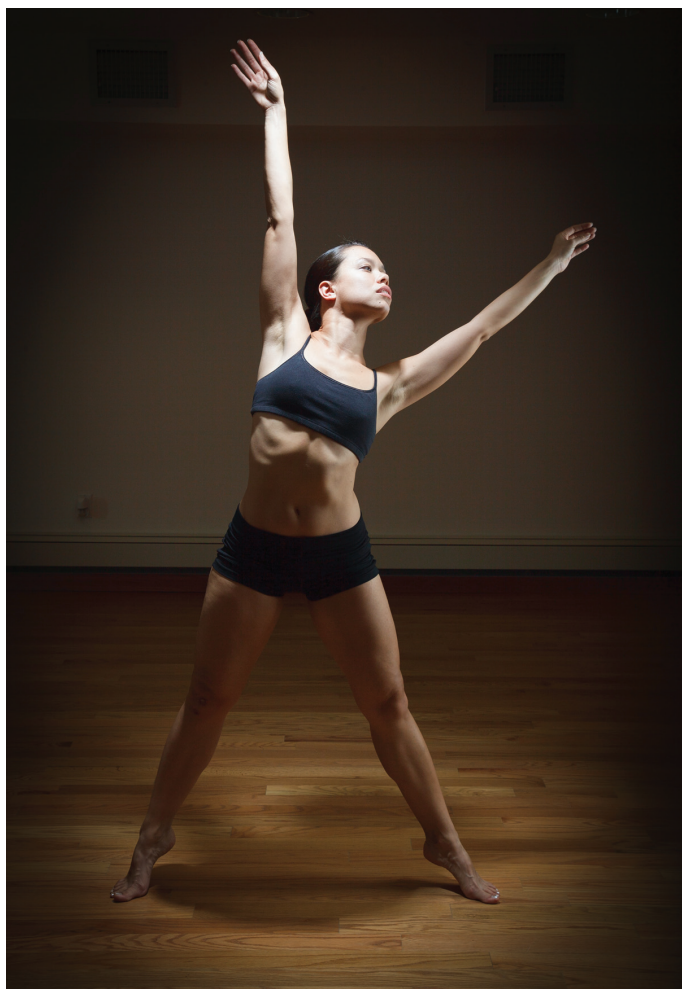


PHOTO: ANDRE GIOVANNI



ARTS AND SCIENCES: Virginia Pedicord, PhD '10, during her postdoc at The Rockefeller University (above) and demonstrating her dancing talents (opposite page)

regarded as a strike against her. At WCM, though, her interviewers had the opposite reaction. “When people have a breadth of experience in areas outside medicine or science, that often indicates a broad view that’s conducive to creativity and to having new ideas,” says one of those interviewers, Carl Nathan, MD, the R.A. Rees Pritchett Professor of Microbiology and chair of microbiology and immunology, who was appointed graduate school dean last year. “And young people who are multi-talented often have trouble deciding which avenue to pursue; they try one and then choose another. So I didn’t regard her sojourn in dance as a negative. Given how well she had done academically and how good her recommendation letters were, I actually saw it as a positive.”

During her doctoral studies in the lab of James Allison, PhD (who has since left WCM to become chair of immunology at the University of Texas’s MD Anderson Cancer Center), Pedicord didn’t pursue dance at all. In retrospect, she says, that was a mistake—both for herself and for her work. “Partially because I had been out for five years, I felt a lot of pressure to catch up, get back up to speed,

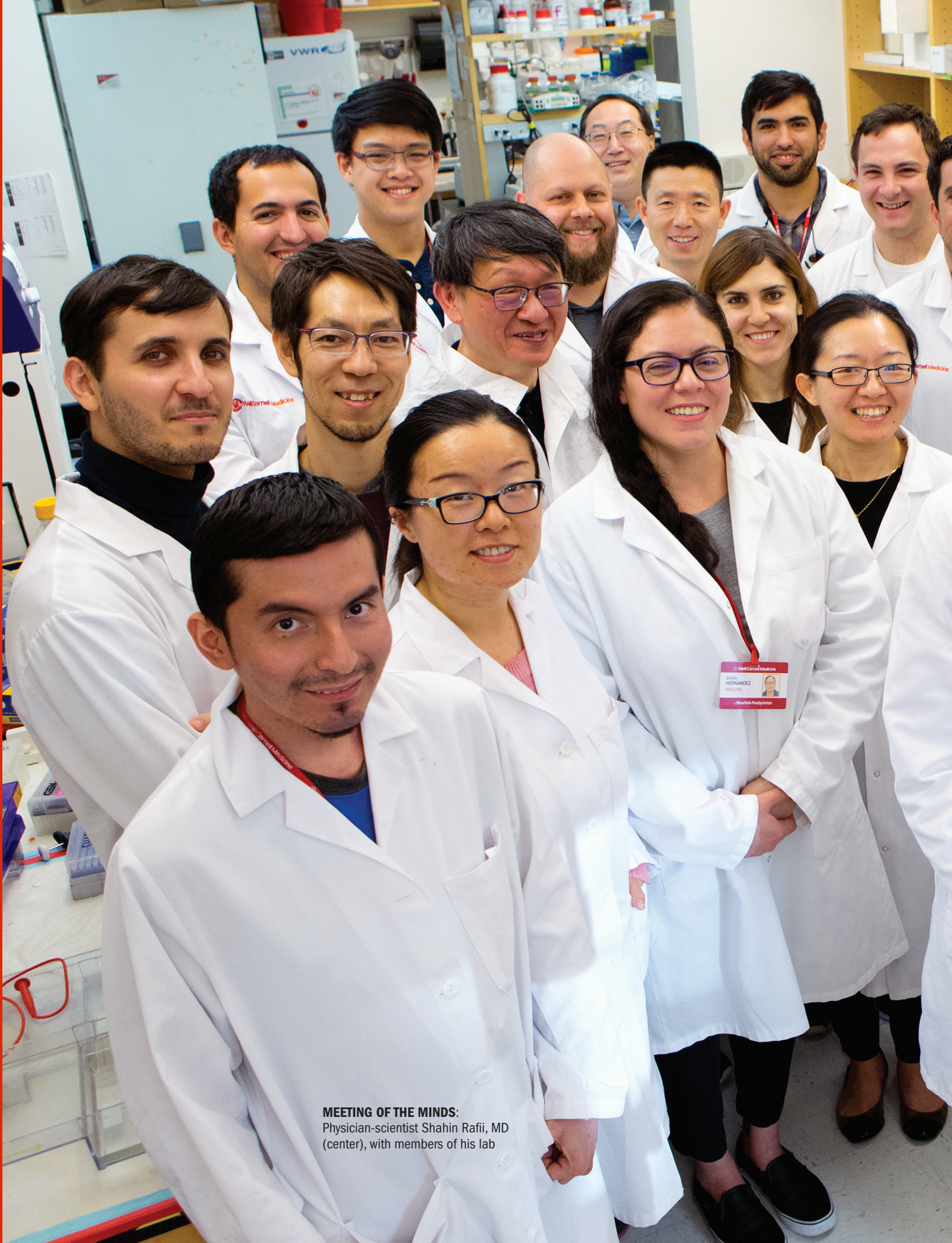
and be really productive, so I just worked in the lab all the time,” she says. “I told myself that I didn’t have time to dance and that I couldn’t lose focus. But I really did miss it.”

Pedicord resolved to carve out a more balanced lifestyle as a

‘I missed having a question to investigate and answer,’ Pedicord says. ‘So as time went on, I realized that although I loved dancing, I didn’t feel a strong need to do it as my career, and I felt drawn to come back and do my PhD.’

postdoc. During the nearly five years she spent splitting her time between two labs at Rockefeller, she took dance class about twice a week and performed with Alvin Ailey Extension, the prestigious troupe’s educational arm. “In many ways, New York is the perfect place to do both science and dance, because the city offers so many of those opportunities,” she says, then adds with a laugh: “But I’m forty and I haven’t danced professionally for a long time—so my leg definitely doesn’t go where it used to.” ■

—Beth Saulnier



MEETING OF THE MINDS:
Physician-scientist Shahin Rafii, MD
(center), with members of his lab



THE GIFT OF Life

After decades of intense research, Shahin Rafii, MD, and his group are making dramatic advances in the quest to grow human blood cells outside the body

BY JOHN HUBBELL

The proof they were seeking was close; the researchers knew that much. After years of trying—years in which the lights on the west side of the Ansayr Stem Cell Institute and Division of Regenerative Medicine deep inside Weill Cornell Medicine (WCM) made a small and unyielding dot on the predawn Manhattan skyline—their experiment had unfolded as Shahin Rafii, MD, and his team had long theorized. Inside a small Petri dish yards away from Rafii's office, human blood stem cells capable of forming into any type of blood cell had multiplied time and again in a carefully curated environment. Viewed through a powerful microscope, the cells seemed to dance and glow as they grew in number, four becoming eight, then sixteen, then thirty-two. On it went.

It was, in short, a breakthrough. The cells' reproduction would go on to be the subject of two articles in *Nature* and to advance scientific thought on how blood diseases might someday be treated. But seeing something of this magnitude with their own eyes, as they did on an afternoon in July 2014, was not enough: the task of a pioneering researcher is not simply to trigger a phenomenon, but to then explain precisely how and why it occurred. They were, after all, on the path to assert that long-lasting blood stem cells could be grown outside of a human body. Even as their own doubts dissipated, they knew that questions would soon come from all sides.

Rafii's lab, like so many cutting-edge research centers across the globe, is a landscape of hedged bets and fleeting euphoria. There are no bed-bound patients or pacing relatives begging for cures. Its warren of rooms sit largely quiet. Refrigerators hum; fluorescent lights glow; the hour of day is elusive. This, its greatest drama—cells bopping about on a monitor, an excited cluster of people pointing and talking—is rather muted, considering the potential clinical implications.

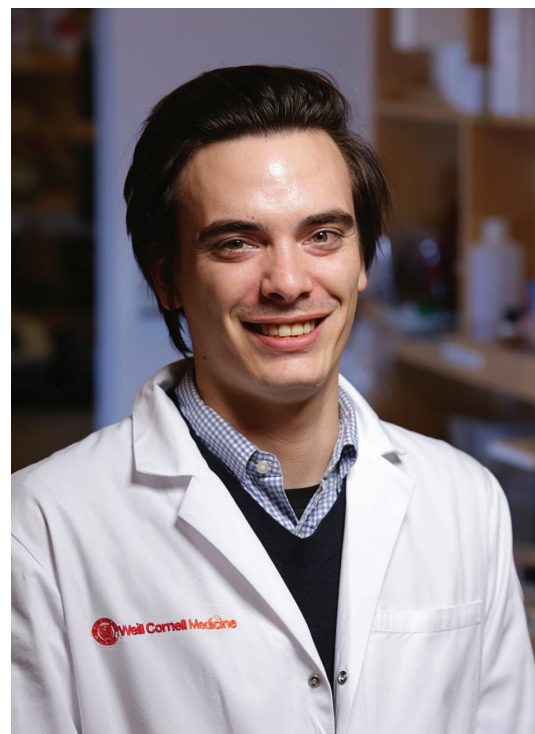
But imagine these landmark blood cells grown in Rafii's lab bound for a cancer-stricken child—her bone marrow ravaged, her blood bereft of the T-cells central to life itself, her body wan and unable to help itself grow strong again, hope dimming. Globally, more than 300,000 children receive a cancer diagnosis each year and 80,000 die of the disease, according to the American Childhood Cancer Organization. And “a large number of patients who could be cured by a bone marrow transplant do not have a suitable donor” says Joseph Scandura, MD, PhD, scientific director of the Myeloproliferative Neoplasms Center, part of the Division of Hematology and Medical Oncology at Weill Cornell Medicine, an oncologist at NYP/Weill Cornell, and a senior co-investigator in the project.

Here on Rafii's screen was a possible new weapon against the carnage of cancer. The idea: extract a healthy cell from the patient themselves, multiply it

in the lab, then send those cells back into the body to facilitate healing. “If we can do this,” Zev Rosenwaks, MD, chief of reproductive medicine at WCM, recalls saying to Rafii, “then we have an unlimited source of stem cells for curing the patient. We can turn a single stem cell that is destined to become a blood vessel into blood.” Cracking the code of how a blood stem cell is triggered to repopulate, the scientists believed, could ultimately lead to a simple, bold statement that eludes many dedicated scientists like Rafii over a entire lifetime of research: this could someday form a new cure.

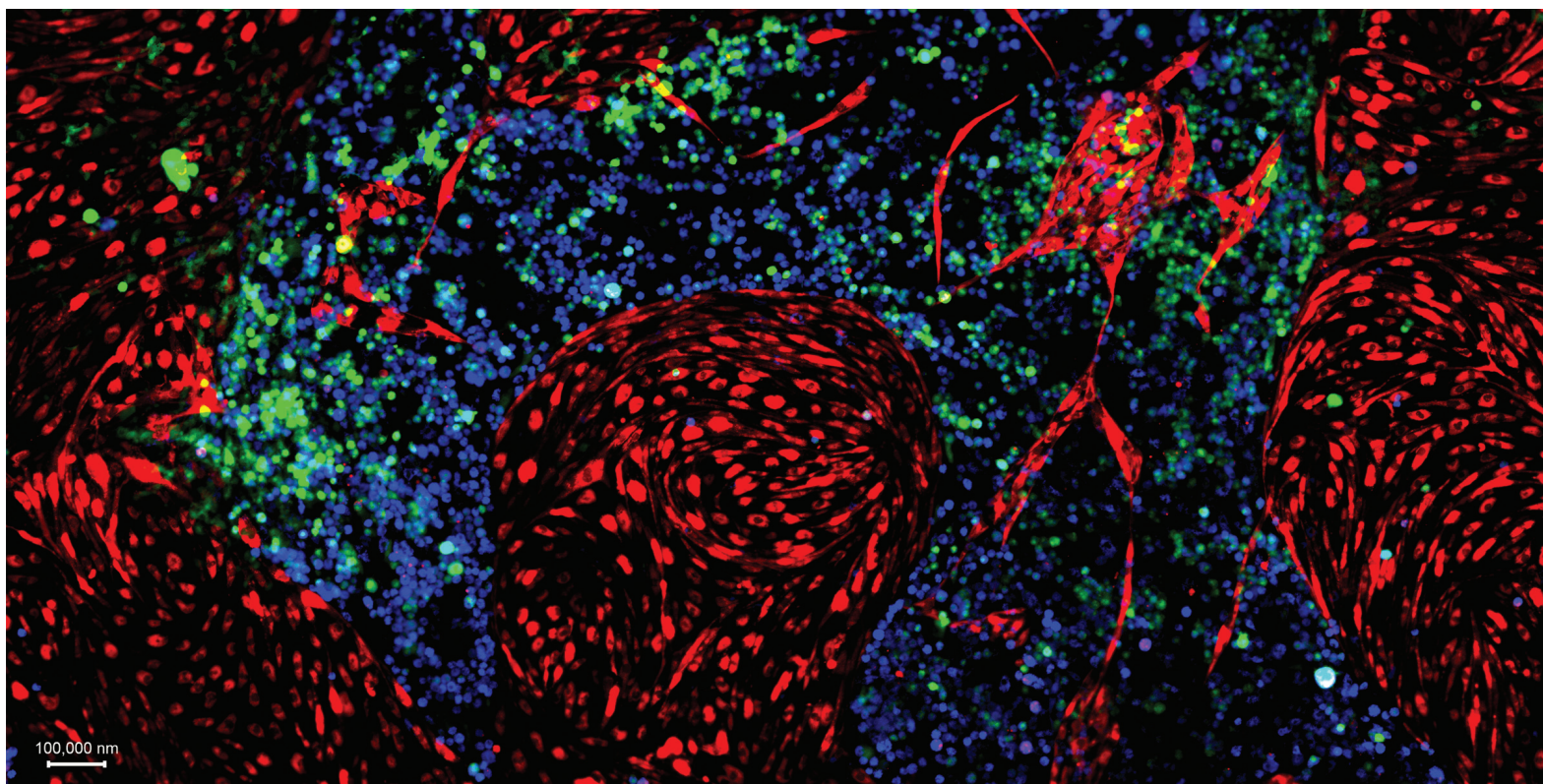
Colleagues underscore how much is at stake. Michel Sadelain, MD, PhD, director of the Center for Cell Engineering at Memorial Sloan Kettering Cancer Center and an associate professor of immunology in medicine and in pediatrics at WCM, agrees. “The pursuit of hematopoietic stem cell expansion is one of the grand goals of biomedical research today,” he says. “If we were able to generate large numbers of unadulterated blood-forming stem cells, a number of diseases—from cancer to autoimmunity and more—could be better treated.”

Nancy Speck, PhD, an investigator at the Abramson Family Cancer Research Institute at the University of Pennsylvania's Perelman School of Medicine, notes the all-or-nothing risk inherent in Rafii's quest. “Shahin is trying to develop new technology—that could have potential clinical application,” she says. “It's a risky proposition and requires a lot of courage to go down that path. However, the payoff could be enormous.”



Raphaël Lis, PhD

PHOTO: (THIS PAGE AND PREVIOUS SPREAD) JOHN ABBOTT



CREATIVE ACT: Reprogrammed blood stem cells (depicted in green and blue) expanding on top of their vascular niche (in red).

An All-Consuming Hypothesis

“Twenty years of my work!” Rafii says in his trademark mix of whimsy and astonishment, speaking in his office on an autumn afternoon between frequent visitors and dings of arriving e-mail. For twenty years, he held to the lonely notion that endothelial cells could be coaxed into generating human blood cells and in turn fight disease. The fate of his lab was tied to this belief, just as the fates of future patients would be tied to what unfolded there too.

Rafii earned a bachelor’s degree from Cornell University in 1982 and an MD from Albert Einstein College of Medicine four years later, then came to NYP/Weill Cornell, where he completed his internship and residency in internal medicine and a fellowship as a hematologist and oncologist. After several years of taking care of patients, research in stem cell biology beckoned.

At the Ansary Institute, postdoctoral researchers came and went. Rafii, the institute’s director, would travel around the world for conferences he felt he could not miss, but otherwise stayed close to the lab. But since the promise of the multiplying cells so perpetually teased his mind, why leave? Mostly he continued—writing grants, revising papers, adding to a filing system of papers atop his desk, and mulling over new ways to produce blood stem cells. ➤

Here on Rafii’s screen was a possible new weapon against the carnage of cancer. The idea: extract a healthy cell from the patient themselves, multiply it in the lab, then send those cells back into the body to facilitate healing.

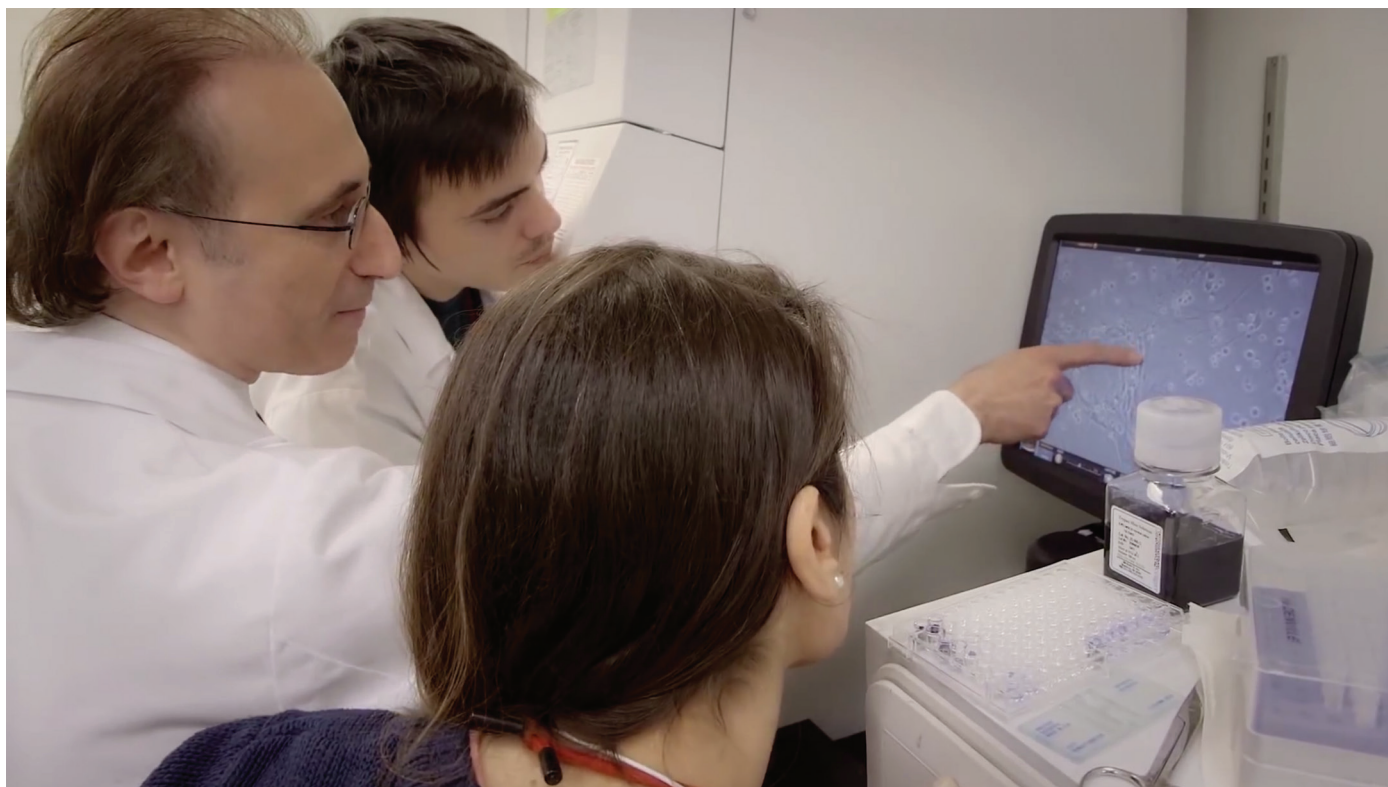
Rafii had a radical theory: the cells that line blood vessels are not merely passive conduits. 'Shahin had this idea, and he was alone,' Lis says. 'No one believed him.'

Uncovering Stem Cells' Secrets

"Let's go back ten, fifteen years," says Raphaël Lis, PhD.

It's late on a weeknight in November, and Lis—now an instructor in regenerative and reproductive medicine whose visibility has risen along with the lab's recent work—is finally home at his apartment on the Upper East Side. "Cells that line blood vessels were seen as passive conduits for blood," he says, summing up decades of conventional thinking. By contrast, Rafii theorized that these cells—known as endothelium—were more important. His thought, Lis says, "was that these endothelial cells, besides delivering nutrients and oxygen, assume a mastermind function." Adds Lis: "Shahin had this idea, and he was alone. No one believed him."

It was 2008. Lis was on track to continue studying in his native France at the University of Paris-Sud when his mentor there, Jeremie Arash Rafii Tabrizi, MD, PhD, was lured away by Rafii (no relation) to establish a lab in Weill Cornell's new location in Doha, Qatar. Lis, eager to continue work with Tabrizi researching the role that endothelial cells played in gynecological cancers, followed him. "The opening of the laboratories corresponded to everything I loved—adventure, out-of-the-box risk," says Tabrizi, who continues work at WCM-Qatar as an associate professor of genetic medicine in obstetrics and gynecology. "But I would not have gone alone. I realized that Raphaël was probably one of the brightest students I ever had. I accepted the position when he told me that he would jump on the adventure, too."

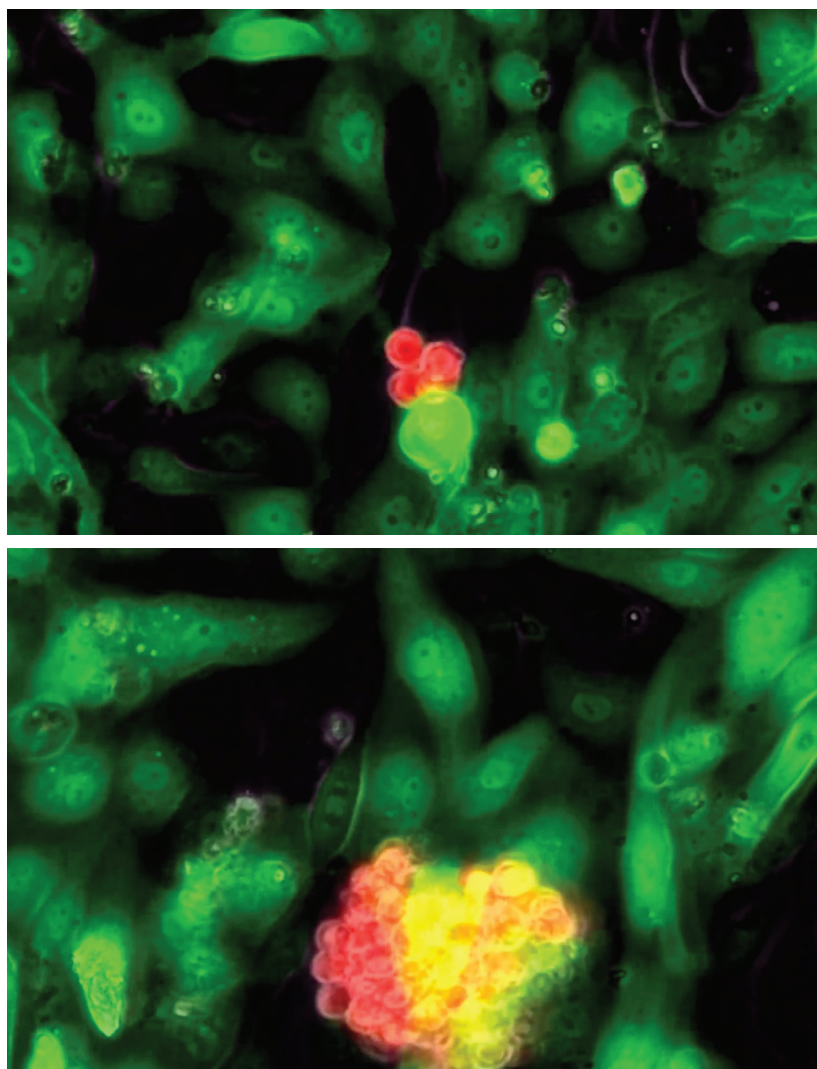


MAKING PROGRESS: Rafii (left) and colleagues in the lab

The Doha lab had no live specimens for research, so as Tabrizi and Lis pursued their own quest to understand how to generate true blood stem cells from embryonic-like pluripotent cells—a broad family of universal building blocks that could differentiate into a variety of cells, including hematopoietic stem cells—they collaborated with Rafii and his team in Manhattan. Once a year, when Lis came to work alongside Rafii in New York, they would inject human blood stem cell derivative from pluripotent cells into mice depleted of blood cells, then wait for something to happen. Under the right conditions, these cells eventually spur the creation of a multitude of healthy blood cells. Yet time and again they did not. “We were getting some blood stem cells in a dish,” Lis says. “Major disappointment. Literally nothing happened.” He continues: “When we transplanted these human cells, they looked like a true hematopoietic stem cell. But once you tried to assess their function, it turns out they don’t engraft”—the process whereby cells grow and make new blood cells—“in the way that true stem cells do.”

Hematopoietic stem cells reside in the safe haven of the vascular system, producing blood indefinitely. As innumerable cells of all types die, they work to replenish them. A body withers when illnesses like cancer disable hematopoietic cells and their crucial regenerative ability is lost. If Rafii was right about the endothelium’s power, his team was missing something in the relationship between it and stem cells—a conductor, a prompt. What triggered the hematopoietic cells to multiply and stay young? And what governed their differentiation?

Labs elsewhere were taking different approaches to probing the relationship between cells and their incubating, encasing vascular niche. As the cells went about creating various organs and tissues, something inside them was dictating the multiplication and specialization. Some researchers focused on mesenchymal fibroblasts—cells common in animals and the essence of connective tissue—believing they might be key. Others looked at forms of pluripotent cells—and while the potential of these types of stem cells is tantalizing, efforts to coax them into working blood stem cells had long posed daunting hurdles. But if, as Rafii held, the endothelium itself inside the vascular niche were essentially governing a blood stem cell’s reproduction and future role in an organism (“a kind of bar code,” Lis says), then the researchers’ failed attempts to grow cells proved that this process was not simply happening on its own. “It took us several years to come to the realization that maybe the actual experimental pluripotent model we were working on was skewed toward failure,” Lis says. “We were about to say it’s impossible, but we went back to the drawing board to look at endothelial cells and teach them to



GROWTH FACTOR: Hematopoietic stem cells (in red) expanding as a colony on the vascular niche (green).

turn into stem cells. That was the beginning of the first *Nature* paper.”

Lis, his doctorate now in hand, moved to New York to work alongside Rafii. There he joined forces with Rosenwaks, Scandura, Jason Butler, PhD, an assistant professor of regenerative medicine, and Vladislav Sandler, PhD, then an instructor in genetic medicine, as they focused their work on a number of micro-environmental cues secreted by a vascular niche. By now they knew that simply introducing human endothelium into this environment was not enough to cause the creation of blood cells. The key, they theorized, was figuring out which blood-specific transcription factors—essentially on and off switches that regulate gene expression—triggered it to interact.

In contrast to more circuitous pathways that could prompt the endothelium to produce blood cells, “this approach makes the most sense,” says Speck, the University of Pennsylvania researcher, because “it starts with what is developmentally the closest relative of the hematopoietic stem cell. So, theoretically, less >

manipulation will be required to tease these cells into adopting a new fate.” The team added twenty-seven known transcription factors directly onto the adult derived endothelial cells that were carefully mixed with the nurturing vascular niche, where the human endothelium sat ready to interact with the stem cell. Then, they closed the lab incubator and waited.

“Boom! It was like magic,” Lis says. “Within twenty days, the adult endothelial cells were receiving instructions from the transcription factors to turn into hematopoietic stem cells. And the newly born stem cells were getting the proper signals from the vascular niche to divide, stay healthy, and prepare to form many types of blood cells.” The ensuing *Nature* paper, published in 2014, trumpeted the group’s significant advance: direct conversion of adult endothelial cells into hematopoietic cells could be achieved. Then came the knocks. “The major criticism about the first paper was, one, we could not show that the blood cells we created could form T cells [which guide immune response to disease],” Lis recalls. “And that’s how the second *Nature* paper started.” Butler, his fellow researcher, recalls wondering whether they could “show this more carefully—and figure out how the stem cells are created.” Could these cells truly rebuild the immune system?

Understanding Their Discovery

The next task was to untangle this unprecedented switching process. Which of the transcription factors turned an endothelial cell into a potentially life-saving magic bullet? All twenty-seven? One? Eight? While the lab’s first scientific article had established that hematopoietic stem cells could be created in a bold new way, it did not sufficiently show how to quell doubts that the process could be reliably replicated. To find out, “we had to run an n-minus-1 experiment,” Lis says, in which factors were subtracted, one by one, to identify the genetic instigator. “This part of the work was tedious,” he says, describing a process that spanned from late 2012 into 2014. “It was purely experimentally driven. Here, we really wanted to just find the key players that could elicit this kind of answer. If you put in twenty-six and you don’t see the phenomenon happening, you knew that the one you removed was actually driving something. The most difficult thing was to figure out that part.” Yet it was crucial to seeing how it all might one day help to cure disease.

Coming as it did after *Nature* heralded the lab’s first big advance, the plodding work to expand on their discovery was even more perilous. Further research could reveal their approach required several refinements, for one. And competitors, never far behind, were now tipped to the fact that Rafii’s lab was on to something. “There’s the frustration created by the nature of the

work,” Lis says. “You can’t control everything, you know you’re competing with someone else, and if their article comes first, your career is not going to advance. And on top of that, you worry about the experiment working—and whether it can be replicated.”

The researchers pressed on—adding one factor, subtracting another. Twelve-hour days were standard; toward the end, Lis recalls being at the lab until 3 a.m. “There’s kind of two teams: the early birds and the late-nighters,” he said. “Shahin belongs to both.”

Eventually the team narrowed the transcription factors critical for generation down from twenty-seven to four. But with the pathway identified, an additional challenge remained: how to prove the cells being created by the process were in fact blood stem cells, not simply cells that looked potent but would prove less useful when reintroduced into a future patient. “So we used a mouse in which all the blood stem cells are genetically painted green, but endothelial cells are not green,” Scandura says. “So if an endothelial cell becomes a hematopoietic stem cell, they become green.”

The Cells ‘Last Forever’

In his office, Rafii watches as the microscopic movie of the process plays out on his computer monitor for a visitor. What unfolds is undeniable and easy to see: flat endothelial cells blossom into green, round blood stem cells. “Look, no fake cells here—round and green!” he says. “Nobody has done that in tissue culture before. That one newly born blood stem cell became multiple cells. And now you can get each of these, transplant them into mice, and the mouse’s whole bone marrow comes back.”

Four months later—a critical scientific measuring point—the cells were still alive. And they were seen to last just as long inside another mouse through a second so-called serial transplantation. “If it was a progenitor cell, the supply would exhaust,” says Butler, the team’s transplant expert. Adds Rafii: “If they are really stem cells, then they should last forever, right?” He pauses. “They last forever.”

After multiple iterations and funding from numerous agencies, including the New York State Stem Cell Initiative, the team’s second paper was submitted to *Nature* on April 4, 2016, and accepted nearly a year later. While the birth of new hematopoietic stem cells with the potential of forming full immune cells was a major finding of this paper, another major benchmark was less emphasized: “The newly formed blood stem cells were generating more of themselves, ‘self-renewing’ over and over again,” Scandura marvels. “The key was the vascular niche we engineered, which mimicked the environment from which they grow and multiply.”

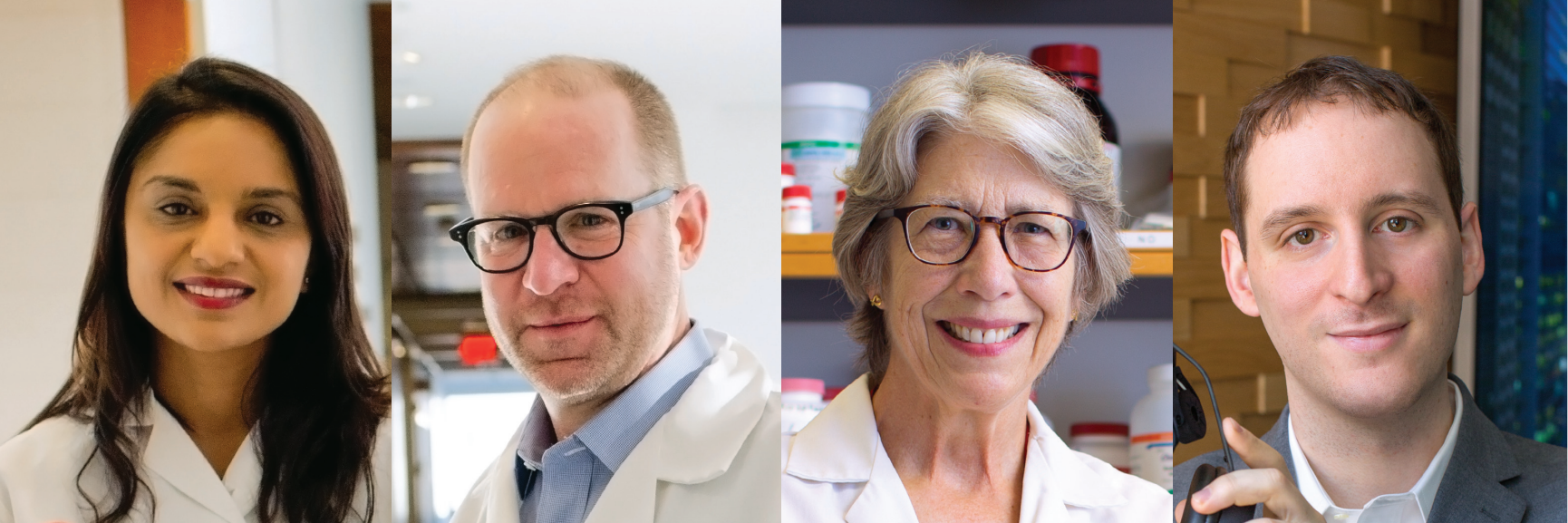
The road ahead, and the implications it may bring, is clearer than ever before. The Rafii team's discoveries "will likely lead to multiple first-in-human clinical trials," says Isabelle Rivière, PhD, director of Sloan Kettering's Cell Therapy and Cell Engineering Facility. The work, she adds, is "potentially transformative," with Penn's Speck adding that it could ultimately cure patients who need a bone marrow transplant but cannot find a suitable donor. Lis agrees—but cautions that the burst of recent breakthroughs belies the long road ahead. "People aren't going to hear from us for a while."



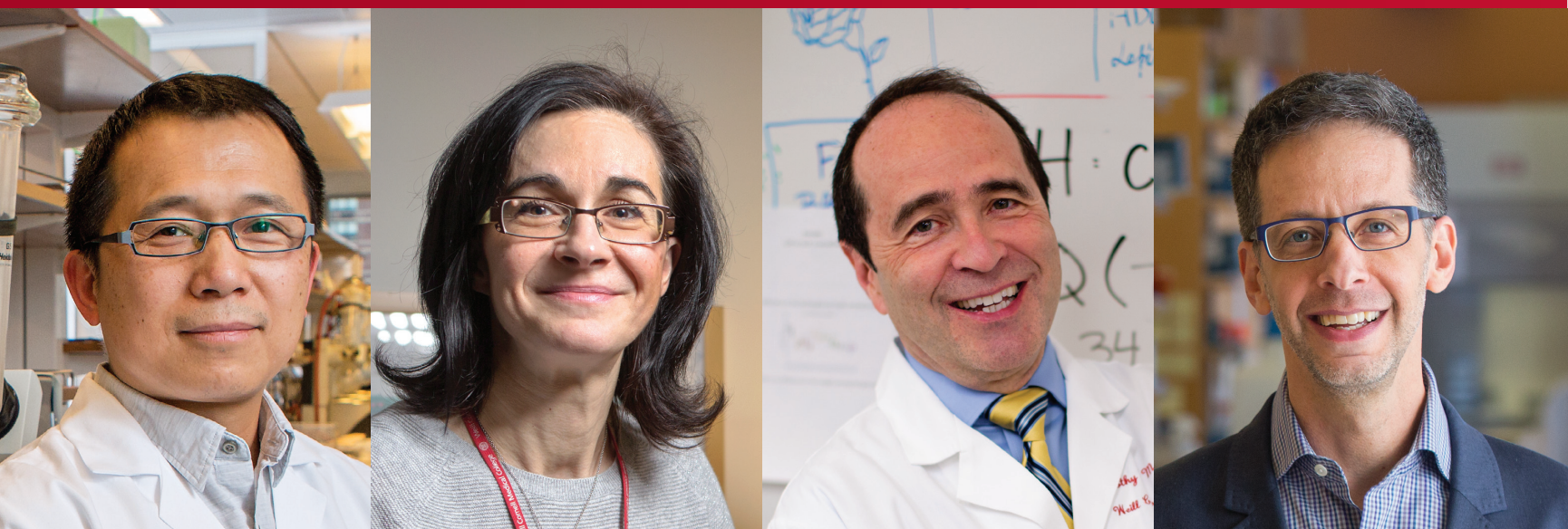
TIRELESS EFFORT: As Lis says of Rafii, "There's kind of two teams: the early birds and the late-nighters. Shahin belongs to both."

For the multitude of academic implications that come from producing blood stem cells in the way Rafii has pioneered, patients and their families obviously care about only one: will it work? That is why the Rafii team's breakthrough discovery, like so many in the field, answered one big question yet raised so many others. From a clinical perspective, the process created inside the Ansary Stem Cell Institute and Division of Regenerative Medicine would simply take too long to help an ailing patient in the everyday world. The odds would be long to survive a nearly month-long wait for blood cells to be regenerated outside of your body and then sent back inside to heal. "That's the question we are trying to solve right now—how scale-able this process is—and that's why we're switching to a larger model," says Lis, pointing to trials being prepared in collaboration with Hans-Peter Kiem, MD, PhD, a noted stem cell biologist at Fred Hutchinson Cancer Research Center in Seattle. "That's the entire idea of the trial we're doing now: safety and scale-ability." Next, Rafii says, "We want to decrease the time to form the stem cells, from twenty-eight days to maybe ten. We'll make the niche more efficient—and most importantly, we will watch the mysteries of stem cell self-renewal unfold in front of our eyes in real time." ■

For the multitude of academic implications that come from producing blood stem cells in the way Rafii has pioneered, patients and their families obviously care about only one: will it work?



The Entrepreneurs



Fostering a culture of innovation, Weill Cornell Medicine is making it faster and easier for researchers to move their discoveries from bench to bedside

BY BETH SAULNIER

PHOTOS BY JOHN ABBOTT

As Dean Augustine M.K. Choi, MD, sees it, the programs that Weill Cornell Medicine has established in recent years to nurture the evolution of faculty research into new patient therapies aren't just innovative. Together, he says, they add up to something unique in the history of academia. "For the first time, there is a fully funded, fully staffed, unbroken pathway from an idea in a professor's head to proving it works in people," he says. "This is not happening anywhere else in the world."

One of those programs, the nonprofit Tri-Institutional Therapeutics Discovery Institute, fosters early stage drug development by bringing WCM investigators and their colleagues at neighboring institutions Memorial Sloan Kettering Cancer Center and The Rockefeller University together with medicinal chemists from Japan's Takeda Pharmaceutical Company. "The true value of our faculty's innovative research isn't revealed until it gets into the human realm," says its inaugural Sanders director, Michael Foley, PhD. "Being entrepreneurial and moving these projects forward are where we really begin to shine." At WCM, he says, "our professors have more of these tools at their disposal than at any other academic institution on the planet."

Those tools include a further step in the drug development pipeline: a for-profit company, Bridge Medicines, that was founded in 2016—three years after the Tri-I TDI. A collaboration by the TDI partners and two investment firms, Bridge Medicines furthers development of drugs that have been nurtured by TDI and have commercial potential. "We take a molecule from the time it first shows potential at TDI as a drug candidate and do the work required to initiate clinical trials," explains its CEO, William Polvino, MD, a pharma industry veteran trained in internal medicine. "A lot of those activities go on behind the scenes and are not particularly glamorous—but oftentimes it's where things stop, because getting to the point of clinical studies requires time, money, and expertise."

Both TDI and Bridge Medicines are innovative approaches to closing the proverbial "development gap." Also known as the "valley of death," it's the space where too many promising clinical advances languish, stuck between the initial idea and the concrete results that would attract funding from granting agencies or outside investors.

But programs like TDI and Bridge Medicines have another benefit as well: they nurture the entrepreneurial, can-do spirit that is growing among researchers at WCM and its peer institutions. "The entrepreneurial ecosystem we're building here is critical for recruitment and retention," notes Larry Schlossman, WCM's managing director of BioPharma Alliances and Research Collaborations. "When new faculty are being recruited, the department chair often asks me to meet with the potential recruit, because he or she has asked what programs and infrastructure we have to support entrepreneurship. They're interested in developing new technologies and starting companies—and only those institutions that offer dedicated resources are going to be able to compete."

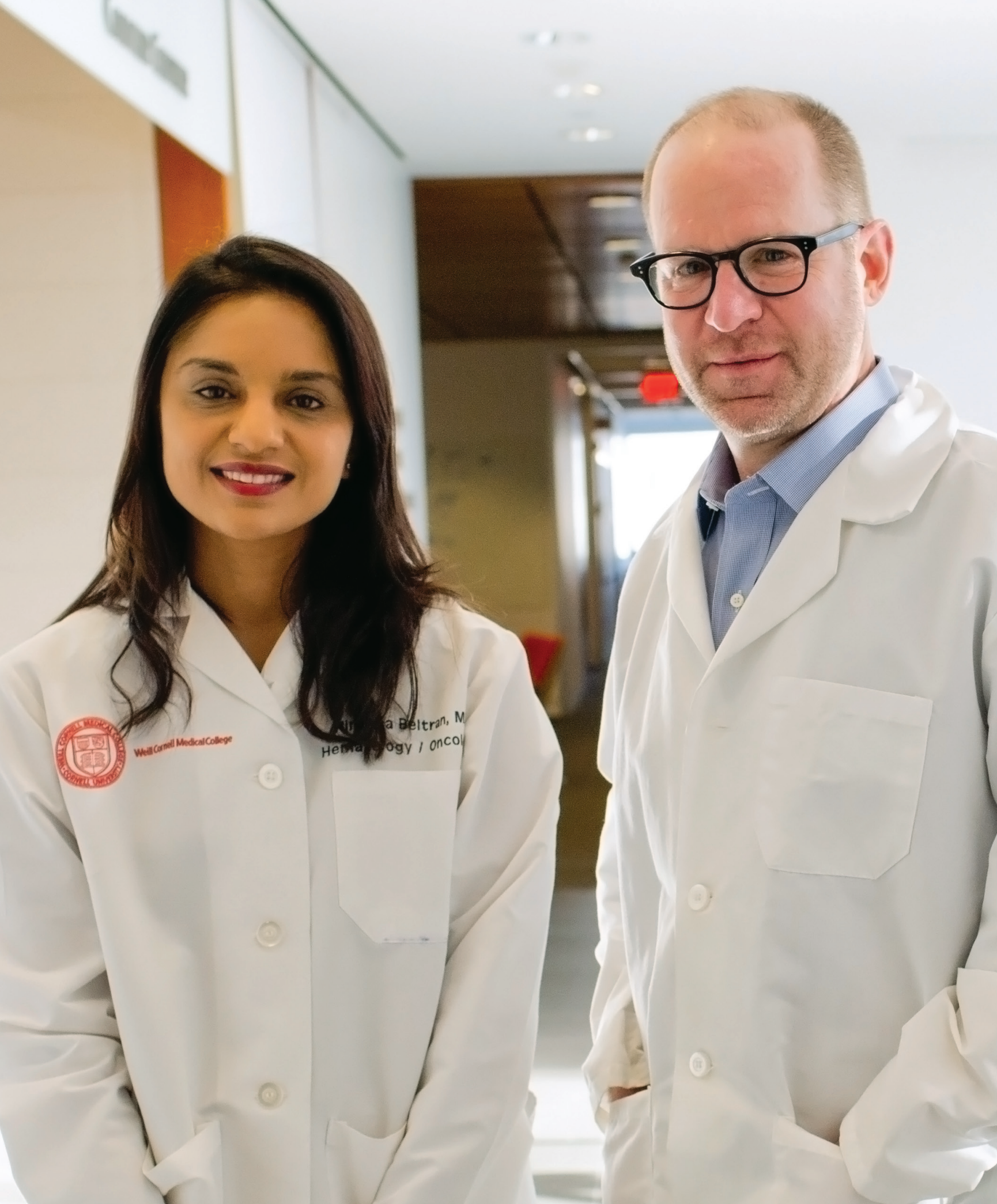
Opened in 2014, the BioPharma Alliances and Research Collaborations office was founded specifically to catalyze business development opportunities around the work of WCM investigators, which includes designing the value proposition of faculty and student work, crafting and marketing collaboration proposals to industry, generating interest from outside investors, and negotiating high-value research alliance agreements. It has proven critical to generating interest from outside investors and significant increases in research funding from industry. The office's efforts include launching the Weill Cornell Medicine BioVenture e-Lab (formerly known as the Dean's Entrepreneurship Lab), which offers resources and training for students and faculty interested in translating their research to the commercial sphere—a cadre whose number are growing. A related, University-wide entity, the Center for Technology Licensing (CTL), has a New York City office, run by Brian Kelly, PhD, that also plays a significant role in Weill Cornell Medicine's entrepreneurial ecosystem. CTL works with WCM faculty to identify and manage their inventions, filing patents on those ideas and marketing and licensing them to potential industry partners. In many instances, these inventions can be the genesis of start-up companies, with which CTL negotiates the foundational intellectual property agreements. "The spirit at Weill Cornell is phenomenal," Polvino says. "I see a lot of energy, excitement, and interest. The ideas and momentum here are great."

In 2014, WCM established a funding stream to help propel the development of promising ideas. Known as the Daedalus Fund for Innovation—named for an ingenious inventor from Greek myth—it supports early stage research projects that have significant commercial potential, offering awards of as much as \$300,000. Schlossman emphasizes that Daedalus is not a grant-giving entity, but rather a business-focused seed fund for technology development; its goal, he says, is to establish sufficient proof of concept to attract outside investment, getting projects to the point where they're "partnership ready." "We're trying to build a pipeline," he says. "The attrition rate in pharma is formidable and sobering, because almost everything

'For the first time, there is a fully funded, fully staffed, unbroken pathway from an idea in a professor's head to proving it works in people,' says Dean Choi. 'This is not happening anywhere else in the world.'

fails in clinical trials. So you've got to get technologies out of the lab and into a commercial setting, where they can be developed with the focus and rigor that only industry can provide. The more you increase your shots on goal, the greater the odds that something will succeed."

Taken together, the various programs of WCM's entrepreneurial ecosystem have already nurtured the work of hundreds of faculty and students. Board chairman Jessica Bibliowicz points out that these early successes—including projects spearheaded by the investigators who are featured on the following pages—have inspired similar efforts at other institutions, including Stanford, Oxford, and Johns Hopkins. "The world is waking up to this; it's the hottest thing," she says. "It's very gratifying to see others embrace this model." >



Well Cornell Medical College

Niraj Beltran, MD
Hematology / oncology



HIMISHA BELTRAN, MD Associate Professor of Medicine

DAVID RICKMAN, PHD Associate Professor of Research in Pathology and Laboratory Medicine

BIOPHARMA ALLIANCES AND RESEARCH COLLABORATIONS

Beltran, a physician-scientist, and Rickman, a molecular biologist, have long worked together to study treatment resistance in prostate cancer—research that could aid the 20 to 30 percent of patients suffering from the disease’s deadliest and most aggressive forms. As they explain, while most prostate cancers are driven by male hormones called androgens—and treatments are therefore focused on targeting them—these deadlier forms seem to be spurred by other factors, requiring new methods of attack. To pursue these, Beltran and Rickman sought assistance from the BioPharma Alliances and Research Collaborations office, which generated their partnerships—in collaboration with Mark Rubin, MD, founding director of the Englander Institute for Precision Medicine at WCM—with several drug companies, including Janssen. “Each project is taking a different approach, because there’s not

just one way to tackle this problem,” says Beltran, who has served as a paid consultant to Janssen, “but they have a common goal of improving outcomes for patients with this aggressive subgroup of cancers.” The structure of the deals, as negotiated by BioPharma Alliances, ensures that WCM will receive fair value for its intellectual contributions if the fruits of the team’s research is commercialized. Rickman points out that this work with pharma is typical of the new breed of academic-industry partnership—one that’s quite different from old-style sponsored research. “Historically, collaborations with industry have not necessarily been collaborative; it was, ‘Here’s a compound, here’s some money, go test it for us,’ ” he says. “The kinds of alliances we have now are a lot more interactive; we have recurring meetings where we present the science and the findings. Intellectually, it’s a lot more rewarding.”



KATHERINE HAJJAR, MD

The Brine Family Professor of
Cell and Developmental Biology

DAEDALUS FUND FOR INNOVATION

More than 5 million Americans currently suffer from diabetic retinopathy, the leading cause of blindness in industrialized nations—and by 2050, that number is expected to rise to 15 million. With an award from the Daedalus Fund for Innovation, Hajjar aims to develop more effective treatments by preventing one of the disease's major factors: the proliferation of abnormal blood vessels in the retina. "We have a panel of antibodies that are directed at a novel target protein," Hajjar explains. "The project is to check their efficacy and understand the dosing, timing, and so forth—all the details of treatment—using a mouse model." Support from Daedalus, she says, "is absolutely essential, because the usual funding agencies, like the NIH, do not support this kind of high-risk applied research. While the NIH did support this in the early basic science research stages, all of the necessary follow-up work, which has generated significant added value, would not have been possible without Daedalus funding."

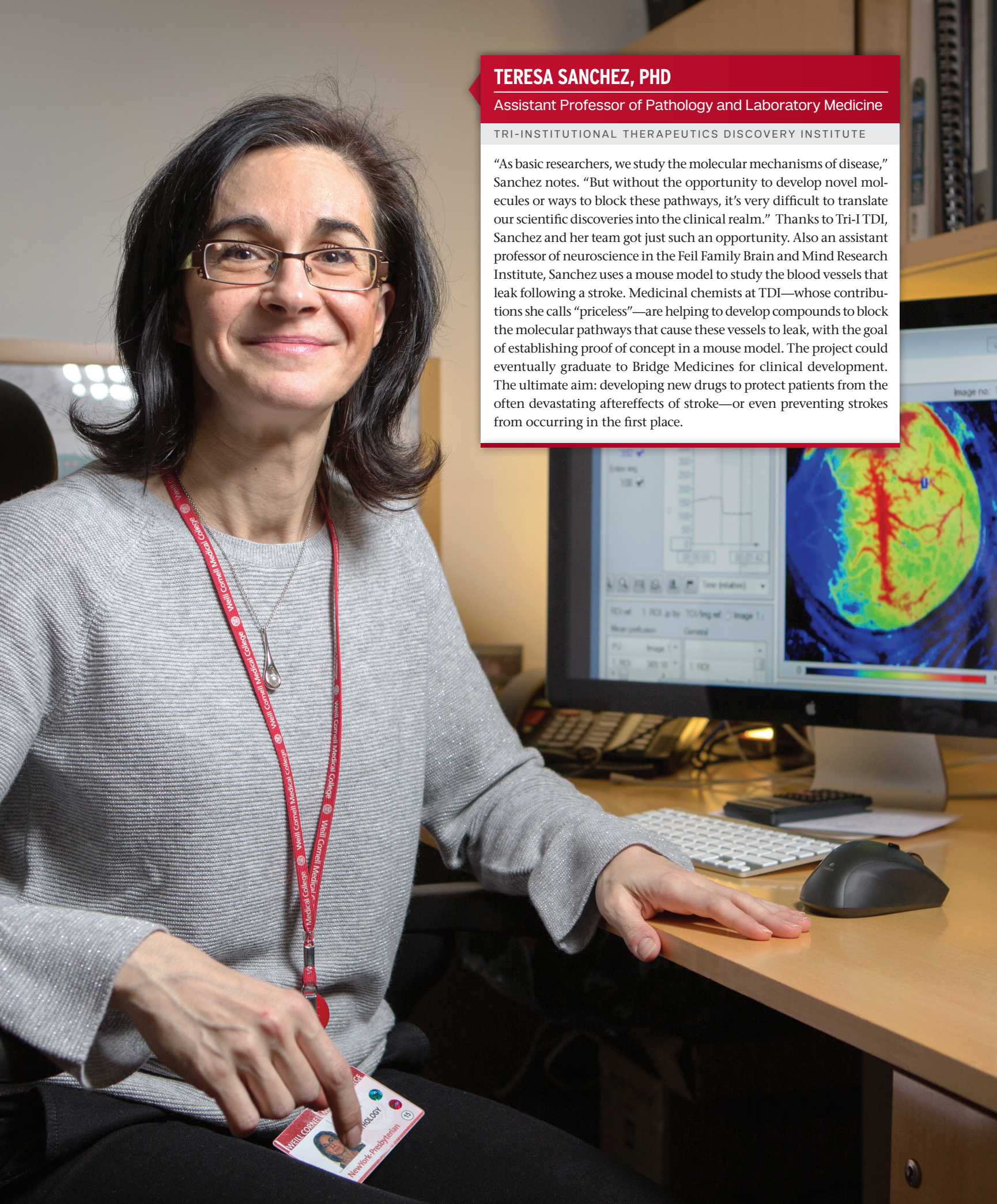


NICK BRAIMAN

Doctoral candidate, Tri-Institutional PhD Program in Computational Biology & Medicine

WEILL CORNELL MEDICINE BIOVENTURE E-LAB

Braiman is a grad student in the lab of Nicholas Schiff, MD '92, the Jerold B. Katz Professor of Neurology and Neuroscience and an expert in disorders of consciousness. While Braiman didn't have entrepreneurial dreams before matriculating at WCM, he has since dived in wholeheartedly. He participated in the Bench to Bedside Initiative, a twelve-week intensive course offered by the Weill Cornell Medicine BioVenture e-Lab that teaches students and faculty how to pitch a biotech company to investors. He also took third place in a recent business plan competition that the Lab held, winning legal advice and \$10,000 in start-up funding for his project, BrainTrak, which he is currently in the process of incorporating. It uses EEG technology to measure how brain damaged patients respond to speech, based on paradigms that Braiman developed. "There are applications for healthy people as well," he says, explaining that since the method essentially measures engagement with a stimulus, it could be valuable for the field of market research—potentially providing more reliable feedback than traditional surveys and focus groups. "One of the advantages of a market research application is that it is possible to generate revenue on a faster timescale, as FDA approval is not required," he says. "This revenue can then be used to fund biomedical applications and improve patient care."



TERESA SANCHEZ, PHD

Assistant Professor of Pathology and Laboratory Medicine

TRI-INSTITUTIONAL THERAPEUTICS DISCOVERY INSTITUTE

“As basic researchers, we study the molecular mechanisms of disease,” Sanchez notes. “But without the opportunity to develop novel molecules or ways to block these pathways, it’s very difficult to translate our scientific discoveries into the clinical realm.” Thanks to Tri-I TDI, Sanchez and her team got just such an opportunity. Also an assistant professor of neuroscience in the Feil Family Brain and Mind Research Institute, Sanchez uses a mouse model to study the blood vessels that leak following a stroke. Medicinal chemists at TDI—whose contributions she calls “priceless”—are helping to develop compounds to block the molecular pathways that cause these vessels to leak, with the goal of establishing proof of concept in a mouse model. The project could eventually graduate to Bridge Medicines for clinical development. The ultimate aim: developing new drugs to protect patients from the often devastating aftereffects of stroke—or even preventing strokes from occurring in the first place.



GANG LIN, PHD

Associate Professor of Research in Microbiology and Immunology

BIOPHARMA ALLIANCES AND RESEARCH COLLABORATIONS

DAEDALUS FUND FOR INNOVATION

TRI-INSTITUTIONAL THERAPEUTICS DISCOVERY INSTITUTE

Lin focuses his research on proteasomes, protein complexes that play key roles in numerous cellular processes. His investigations have spurred him to take part in multiple facets of WCM's entrepreneurial ecosystem, including collaborating with Tri-I TDI; he has also received three Daedalus awards to support work with potential implications for a variety of diseases and conditions, including treating fungal infections and preventing rejection after organ transplant. One of those projects—a collaboration with Carl Nathan, MD, dean of the Graduate School of Medical Sciences and chairman of microbiology and immunology—was the first to go from Daedalus to industry. Their development of a novel class of inhibitors of immunoproteasomes, which play a critical role in inflammation and autoimmune diseases, has enabled a licensing agreement between Cornell University and Allied-Bristol Life Sciences (ABLS, a joint venture between Bristol-Myers Squibb and Allied Minds), and a corresponding dedicated research alliance that was generated by WCM's office of BioPharma Alliances; its aim is to explore safer and more effective treatments for diseases such as lupus. Lin, who will serve as a paid consultant to ABLS, notes that the project's Daedalus award made an enormous difference, enabling the hiring of a postdoc who increased the number of compounds they were investigating—from just a handful to 200. "Without it," he says, "we'd basically still be at the bench."

A portrait of Timothy McGraw, PhD, a middle-aged man with dark hair, smiling and wearing a white lab coat over a blue shirt and a yellow and blue striped tie. He is standing in front of a whiteboard filled with handwritten notes in blue and green ink, including terms like 'HDL, LDL, Adiponectin', 'Leptin', 'F', 'H = CO', '34', 'EE', '3', 'Rw-F', 'cre', 'CR', and 'V'.

TIMOTHY MCGRAW, PHD

Professor of Biochemistry

BIOPHARMA ALLIANCES AND
RESEARCH COLLABORATIONS

McGraw has an analogy for how type 2 diabetes is currently treated: it's like trying to drive a car without disengaging the emergency brake. As he explains, the disease arises when the body becomes resistant to insulin, a process often spurred by obesity. "You can think of insulin resistance as having the parking brake on," he says. "You can try to overcome it by pushing down on the accelerator—but a better way would be to take the brake off." About seven years ago, with scant extramural support, McGraw started exploring a potential way to do just that. He wondered whether insulin resistance might be caused by hormonal changes in the blood that are triggered by obesity, and found promising evidence to support his hypothesis. In 2014, after intensive engagement and negotiation with potential industry partners led by the BioPharma Alliances and Research Collaborations office, an agreement was concluded with the European drug company UCB, under which McGraw began a dedicated research alliance. UCB has provided significant funding and technical assistance as his lab investigates whether his findings could lead to new treatments for diabetes. "This is important biology that could potentially have an impact on human health," says McGraw, who received an honorarium from UCB Biosciences, a subsidiary of UCB. "The funding from the company to take it to the next level has been absolutely critical."

A portrait of Yariv Houvras, MD, PhD, a man with short grey hair and glasses, wearing a dark blue suit jacket over a blue and white checkered shirt. He is smiling and has his hands clasped in front of him. The background is a blurred laboratory setting with shelves of equipment and supplies.

YARIV HOUVRAS, MD, PHD

Assistant Professor of Medicine

TRI-INSTITUTIONAL THERAPEUTICS
DISCOVERY INSTITUTE

Houvras, a physician-scientist and medical oncologist, studies cancer using zebrafish as a model organism. Working with Minkui Luo, PhD, a WCM associate professor of pharmacology whose lab is based at Sloan Kettering, he's focusing on SET8—an enzyme that may be an important target in a variety of human cancers. Using zebrafish, Houvras's lab identified a specific effect of SET8 inhibitors on melanocytes, the cells that give rise to melanoma. He then sought out Tri-I TDI for help in creating new SET8 inhibitors, chemical compounds that can help clarify how SET8 works in normal cells and in the context of specific cancers. "The TDI collaboration has allowed us to have a highly structured and close working relationship with medicinal chemists from Takeda Pharmaceuticals and chemical geneticists from the Luo Lab—it's been a phenomenal team," he says. "TDI has given us unparalleled new tools for studying disease. It's incredibly important to build these interactions, both across institutions and across academia and industry." ■

NEWS OF MEDICAL COLLEGE AND GRADUATE SCHOOL ALUMNI



Dear Alumni,

I am pleased to have the opportunity to update you on some of the activities of your Alumni Association, and some of the events occurring on campus.

Our Alumni Association is as strong as ever, thanks to our nearly 500 dues-paying members. Of course, we'd like to have more—and should you know a classmate or colleague who isn't a current member, please encourage them to join by contacting the Office of Alumni Relations. Your dues payments enable the Alumni Association to continue to evolve while providing valuable resources to the medical students and the WCM alumni community.

The mission of the Alumni Association is to create a lifelong community by connecting alumni to one another, current students, and the Medical College. One way we do that is to provide professional advice and, oftentimes, financial support for the students' endeavors. We recently gave a grant to a group of students who organized a fantastic medical technology entrepreneurship conference called Future of Care that convenes annually to facilitate the design, development, and successful integration of medical technologies. In the past, we've provided funding to the Weill Cornell Community Clinic, Camp Phoenix, and the Weill Cornell Center for Human Rights, to name a few.

We are pleased that so many alumni volunteered to host our fourth-year students traveling for residency interviews this fall and early winter. Alumni have been eager to take students out for meals, give informal tours of their institutions, and in some cases even host them overnight in their homes, helping to alleviate the burden of travel expenses during this critical time. Many thanks to those who stepped up in this way. If you are interested in our host program in future years, please contact the Office of Alumni Relations.

In like manner, we are establishing a pilot program for our recent graduates at popular postgraduate training sites. We are recruiting alumni to touch base with newly minted graduates to make them feel less anxious and more at home as they begin residency. We hope that you will participate! Alumni helping alumni, we believe, reinforces the best qualities of a WCM education.

Reunion 2018 is not far away, and I encourage everyone to come. Not only will you encounter some of our gifted and altruistic students, but you will also see changes in the campus. The Belfer Research Building is up and nearly filled. NewYork-Presbyterian's David H. Koch Center is close to completion and really changes the footprint of the campus. And we have only just started to collaborate with the new and exciting Cornell Tech campus.

Best to stop here, as I could go on for too many pages. See for yourself what is happening here, and renew your connection with Weill Cornell Medicine. I hope that 2018 has gotten off to a healthy, happy, and prosperous start for you and your family.

Stuart Mushlin, MD '73
President, Weill Cornell Medical College Alumni Association
stuartmushlin@icloud.com



PLAYING BRIDGE: Medical student Natasha Smith '21 won honorable mention in the 2017 Medical Complex Art Show for *Brooklyn Splendor*, which depicts the Brooklyn Bridge's bustling traffic against the backdrop of Manhattan. "I took this on my first trip to New York City," she says, "and was struck by the life and pulse of the city present in the speeding cars, dynamic sounds, and sparkling lights."

Medical College

1940s

Charlotte Rush Brown, MD '45, and David Brown, MD '45: "At 97, we may be the two oldest surviving members of the Class of 1945. David is slightly older than Charlotte. We married in September 1944. It's working well so far. We, by virtue of our own medical educations and the services of Weill Cornell physicians and their ilk, have survived two hip and one knee replacements, one aortic valve replacement, one spiral tibial fracture, prostatic cancer radiation and consequences, pulmonary tuberculosis, right coronary occlusion, seven stents, vibriosis, many pneumonia and urosepsis challenges, and two sigmoid reactions; we've surely forgotten other medical events. We have enjoyed in life four full-term

spontaneous deliveries, wide travel, 45 years of medical practice (pediatrics, internal medicine, and public health), mediocrity in most sports of some skill, grace, focus, and acceptance in social yammer sharpened by the *New York Times*, the *New Yorker*, and the *Economist*."

1950s

Roy H. Lucas, MD '52: "We survived Hurricane Irma with only minimal damage, not so for most of the rest of Florida. I still play golf, and Allyn continues to play duplicate bridge. We enjoy *Weill Cornell Medicine* magazine helping us to keep up with medical advancements. Would like to hear from any of the Class of 1952."

Ward O. Griffen Jr., MD '53: "Dave Root '50, MD '53, and I, both surgeons, are still hanging around. He is over 90 and still working at his New York farm. I am almost 90, and although not as vigorous as David, I still manage to get around with a walker, read a lot, and will play most any card game if I can find other participants."

Peter Mahrer, MD '53: "I still do some teaching at USC School of Medicine. I traveled in Europe twice this year, and I'm expecting a great-grandchild. I'll celebrate with a ski trip."

William Hillis, MD '55: "I'm well and living at Ashlar Village (senior retirement) with wife Barbara."

Joseph Johnston, MD '55: "Life is great. I'm still traveling, but can't keep up with

'Following two pleasurable retirement years with more time for family, travel, playing the piano, and revisiting my sorry golf game, I returned to the fray of practice as a urologist in the underserved mountains of eastern Kentucky working with Appalachian Regional Hospitals.'

—Bill McRoberts, MD '59

Artemis Pazianos Willis, MD '55, who travels all the time!"

Albert Kapikian, MD '56, is known as the father of human gastroenteritis virus research for his work developing the first licensed vaccine against rotavirus, a breakthrough for which he received the Sabin Gold Medal in 2005, reports Queens College, his undergraduate alma mater.

David Schottenfeld, MD '56 reports that he is an editor of the 4th edition of *Cancer Epidemiology and Prevention*, published by Oxford University Press in November 2017. "It is viewed as the authoritative reference textbook. My professional titles are John G. Searle professor emeritus of epidemiology and former chair of the department of epidemiology, School of Public Health, University of Michigan."

Charles Santos-Buch, MD '57, has been working for the last four to five years on a book entitled *A Differing View of Cuba's History: Revealed by the Journey of an American Family from 16th Century Spanish Colonialism to Modernity (1509–1960)*.

Bernie Siegel, MD '57: "My greatest satisfaction as a surgeon and physician has been helping people live their diagnosis, heal their lives, love their bodies, and live between office visits and group therapy sessions. Those who do not die when they are supposed to have something to teach us about a case of self-induced healing versus a spontaneous remission."

Bill McRoberts, MD '59: "After 25 years as chair of urology at the University of Kentucky Medical Center, I retired in 2000. Following two pleasurable retirement years with more time for family, travel, playing the piano, and revisiting my sorry golf game, I returned to the fray of practice as a urologist in the underserved mountains of eastern Kentucky working with Appalachian Regional Hospitals. I keep normotensive by referring the complex cases to the university, but that leaves 98 percent of cases for routine care, still a glowing satisfaction at age 84. Best to all my classmates."

James E. Shepard, MD '59: "Sally-Jean and I celebrated our 59th wedding

anniversary by attending the international race-walking competition in St. Cloud, UT. Our daughter, Liz, won first place medals in all three races."

James K. Van Buren '55, MD '59: "Aloha! Mary and I just returned from a 60th wedding anniversary trip to Hawaii: two days in Honolulu, a seven-day cruise around the islands, and five days on Kauai. Doing okay with a new left shoulder and maybe a new right knee later and rising golf handicap! Retirement is good, but getting old ain't easy. Would enjoy seeing or hearing from classmates."

1960s

Jack Bagdade, MD '62: "I'm back in Eugene, OR, after five years at the Phoenix VA Medical Center, where I was the associate chief of staff for research. For income, I have been working as an endocrinologist six days a month for the Lane County Health Department, writing medical opinions for lawyers representing Vietnam veterans with serious maladies related to Agent Orange exposure, and finishing a few manuscripts describing research that I performed earlier in my career. For pleasure, I am still trying to develop a reproducible golf swing and venture back into the business of making sparkling wine."

Bill Hazzard '58, MD '62: "I'm still quasi-retired as emeritus faculty at Wake Forest while enjoying life. I'm deeply involved in internal medicine and geriatrics at the Sticht Center on Aging, where academic geriatrics is growing and flourishing. Hope to see many of you at our class reunion."

William Schaffner, MD '62, professor of preventive medicine in the department of health policy and professor of medicine at Vanderbilt University School of Medicine, received the 2017 Senior Scholarship Award from the Society for Healthcare Epidemiology of America, the premier national professional organization of infection control epidemiologists. The award recognizes the work of an investigator/practitioner in infection prevention/healthcare epidemiology who has made important contributions over many years.

Richard M. Hirata, MD '65: "Kathy and I are enjoying the benefits of Asbury Methodist Village, Gaithersburg, MD, in suburban Washington, DC. It's a community rich in resources and talents, provided by residents on this spacious campus."

John Boothby '62, MD '66: "My neurology practice was stimulating, exciting, gratifying, and, for the most part, fun—but retirement is even better. I retired from office practice in Portland, ME, in 2014, but then worked in Anchorage, AK, as a locum tenens neurologist for eight months before retiring again in 2015. I always wanted to see Alaska and this way I got paid for it. Afterward, my wife, Edie, and I drove around some of the best areas in this beautiful state and had a wonderful time. We have three children and seven grandchildren, all 'above average,' as described by Garrison Keillor. We live in an old farmhouse (1785) near Portland, ME, and do not plan to relocate. My favorite activities include gardening (12-foot-tall Russian sunflowers, etc.), biking, and enjoying our kids and grandkids with Edie, whom I first met crossing the Arts Quad at Cornell in Ithaca."

One of my special interests is sports-related concussion, which provides the opportunity to teach athletes, parents, and coaches about some of the issues involved in contact sports. We have plenty of room for guests coming to Maine; all we need is a 'heads-up' call. I want to say hi to all my classmates. We had a great medical school class, but I spent most of my time studying without much social interaction because of some residual effects after sports-related concussions in college. I am healthy, as are all of the family, and if I see my reflection in the mirror each morning while still standing upright, I anticipate a good day."

David N. Tucker, MD '66: *The Hard Bargain*, Tucker's memoir about his father, the operatic tenor Richard Tucker, was published this fall. *Divo and Diavolo*, a dramatic comedy by Adam Kraar based on the book, had a workshop reading at JCC Manhattan in October 2017.

Charles Hennekens, MD '67, received the 2014 Fries Prize for Improving Health for his research on the lifesaving benefits of aspirin in reducing the risk of heart attack, as well as his work on statins, angiotensin converting

enzyme inhibitors, angiotensin receptor blockers, and beta adrenergic blockers.

William C. Klingensmith, MD '68: "I just published a science fiction book entitled *The Second Creation: Genetic Engineering of Man*, which was 30 years in the making. Alumni will recognize the setting."

N. Reed Dunnick, MD '69: "On July 1, 2017, I became editor-in-chief of *Academic Radiology*, the official journal of the Association of University Radiologists."

1970s

Peter Blumencranz, MD '70, was elected to the board of directors of the American Society of Breast Surgeons. He is the co-author of an article published in *JAMA* on September 12, 2017, entitled "Effect of Axillary Dissection vs. No Axillary Dissection on 10-Year Overall Survival Among Women with Invasive Breast Cancer and Sentinel Node Metastasis."

Jack Kirk, MD '70: "I'm starting to consider retirement after 40 years of general internal/geriatrics/palliative care practice in



STATION IDENTIFICATION:

Ghosts, which human resources staffer Irfan Saloudeen entered in the 2017 Medical Complex Art Show, captures a quiet moment at a Manhattan transit hub. "In the crowded Grand Central Terminal at the height of rush hour, I put my camera on slow shutter speed," he says, "and what came out was this ghostly-feeling image."



CITY OF LIGHTS: Human resources staffer Irfan Saloudeen first thought that *Skyline* would turn out to be a standard New York City shot. “Looking at it again, I realized that I took it on a cold, dark, and damp winter night from the New Jersey side, yet New York still shines bright as always,” says Saloudeen, who entered the photo in the 2017 Medical Complex Art Show. “Whatever may happen, NYC is the city that never sleeps.”

New London, NH. I’m blessed by the immense rewards of caring for many families over 40 years, and proximate enough to Dartmouth Medical Center to have rich teaching relationships with students, residents, and fellows. I give thanks to Weill Cornell Medical College for an excellent preparation for life in medicine.”

Kathryn McGoldrick, MD ‘70: “I had the privilege of delivering the annual Ether Day address, entitled ‘Airway Management through the Ages,’ at Massachusetts General Hospital in October. The occasion marked the 171st anniversary of the first successful public demonstration of ether for surgical anesthesia. This October I also received the Distinguished Service Award of the Wood Library–Museum of Anesthesiology, which was presented during the annual meeting of the American Society of Anesthesiologists. I have spent my entire career in academic medicine, with a particular interest in graduate medical education, working at Harvard, Yale, and New York Medical College. In August 2016, I left New York Medical College after 15 years as professor and chair of anesthesiology, residency program director, and advisory dean for medical student

affairs to work full time for the Accreditation Council for Graduate Medical Education, where I am part of the Department of Institutional Accreditation, focusing on a relatively new initiative known as CLER (Clinical Learning Environment Review). My husband, **Jonathan Mardirossian, MD ‘72**, and I are blessed with good health and a zest for travel. Jon will be celebrating the 50th anniversary of his graduation from Williams College this spring. We always look forward to the next Weill Cornell reunion.”

Dennis J. Lutz, MD ‘73: “This year I began my 31st year as chair of the department of ob/gyn at the University of North Dakota School of Medicine. Non-medically, I was elected president of the International Bank Note Society.”

Thomas M. Anger, MD ‘75: “I guess I could say I am unretired, working in a pediatric office three days a week (no night or hospital duty); keeps me out of the house, as does my cycling. Recently completed my first metric century (62 miles). Grandkids live in Columbus, OH; Maya is 8 and Livia is 4. They are entertaining, to say the least, and we wish we could see them more often. We are still 50 floors up in a Chicago high-rise condo with a great view of Lake Michigan and the Chicago River, and Trump Tower...for what that’s worth. Short bus ride to Lurie Children’s, where I do voluntary teaching, usually twice a month. Ida keeps busy volunteering at a pet shelter and ushering at small live theater venues. I have Waldenstrom’s macroglobulinemia, but it’s very indolent, no treatment yet. One day at a time.”

Paul Church, MD ‘75: “I’m residing in Wayland, MA, and retired from urology practice. I’m active with church, social conservatives, and six grandchildren.”

Gerald Kolski, MD ‘76: “This last year was a special one, as my wife, Sue, and I celebrated our 50th anniversary. This September was my 15th year associated with Healthy Hoops, an asthma screening program associated with AmeriHealth Caritas. I have been involved in the program—which involves asthma screening, education, and instruction by basketball coaches—in Pennsylvania, Michigan, and Louisiana. I continue

to work part time in Huntsville, TX, as an allergist/immunologist."

Anthony Provenzano '72, MD '76: "I'm sad to announce the passing of my wife on December 9, 2016."

Vincent deLuise, MD '77: "I have retired from the active practice of ophthalmology. I am still on the clinical faculty at Yale University School of Medicine and Weill Cornell and serve on the WCM Music and Medicine Initiative advisory board. I remain active with the American Academy of Ophthalmology with a lecture course on Visual Perception and the Arts."

Paul Lachiewicz, MD '77, continues to work as an orthopaedic surgeon specializing in total hip and knee replacements, but decreased to three days a week this year. In October, he reached the summit of Mt. Kilimanjaro in Tanzania with his two grown sons, Mark, an ob/gyn surgeon at Emory, and John, a pilot. He writes, "My wife of 40 years, Ave, and I funded a scholarship this year for a Weill Cornell Medical College student coming from a local or national Catholic college or university. Greetings to other members of the class."

Jeffrey Gold '74, MD '78, and **Robin Hayworth '75, MD '78:** "Robin and I became grandparents a little over a year ago. Our son has the most adorable twins, one of each, living in the San Francisco Bay Area. Great fun!"

Stuart Fischer, MD '79: "It is hard to believe that 38 years have passed since graduation. Things are going well in Southern California. As of August 2016, I stopped taking call. I am now the senior member of our cardiology group. I gave up intervention and all procedures in 2013. We recently moved our office, and we are a full service, six-person group. Some minor health issues, and the loss of family members, made 2017 challenging. Stephanie is doing well, and we celebrated our 41st wedding anniversary. Our daughter, **Kim Fischer, MD '11,** is an anesthesiologist in Denver. Our son, Eric, works for Kaiser in San Francisco, involved in special projects. He married Tiffany Fong in October in Carmel Valley.

1980s

Kevin V. Kelly, MD '80: "I've retired from two of my part-time gigs: director of the communication skills curriculum at Weill Cornell and lecturer in psychoanalysis at Columbia. I've added a new part-time position as consulting psychiatrist to the Presiding Bishop of the Episcopal Church of America. I continue to enjoy being a clinical professor of psychiatry and ethics in medicine at Weill Cornell, a medical officer in the FDNY, a private practitioner, an amateur choral singer, and a grandparent (number five is on the way)."

Brad Radwaner, MD '80, opened NY Cardiovascular Prevention, PLLC, in Manhattan in 1992 and recently added radio frequency vein ablation to his practice. He has very fond memories of watching Chris Chambliss of the Yankees hit the walk-off homerun in game five of the American League Championship in September 1976—bringing the team into the World Series for the first time in 12 years—with many other loyal fans in the Olin Hall student lounge. He also remembers organizing the wine and cheese TGIF parties in the Olin courtyard.

Sharon Strong, MD '81, and **Phil Bossart, MD '81:** "Our oldest son, Chris, 30, is finishing up an ER residency in Albuquerque, NM; Abby, 27, is starting med school at the University of Utah in Salt Lake City. Our youngest, Matt, 25, is an electrical engineer, working on 'batteries' through an NSF grant in Seattle, WA."

Lawrence H. Durban, MD '82: "I continue as director of thoracic surgery at St. Francis Hospital in Roslyn, NY. Having a wonderful time and living the dream. No plans to slow down. There is no finish line."

James Turro, MD '82: "I moved with my wife, Barbara, to northern Ocean County, NJ. We live at the beach and I joined a small Hackensack Meridian primary care practice. Having a great time doing what I love: practicing as a general internist."

David Haughton, MD '84, announced that his art show, "40+ Views of Mount Baker—Homage to Hokusai," will run at Gallery 110 in Seattle, WA, throughout March 2018.

'I continue to enjoy being a clinical professor of psychiatry and ethics in medicine at Weill Cornell, a medical officer in the FDNY, a private practitioner, an amateur choral singer, and a grandparent (number five is on the way).'

— Kevin V. Kelly, MD '80

'Weill Cornell's physician assistant program ingrained the importance of community outreach. Its mission is in line with the PA profession, where social responsibility is the highest form of accountability. As I said [in a recent article in *Scrubbing In*], "There is no greater satisfaction as a physician assistant than to help the underserved and the underprivileged." '

— Mitesh Patel, PA '13

Michelle Goldstein Dresner '81, MD '85: "My son, Samuel, graduated from medical school in May 2017. He is doing his transitional year at Tufts in Boston and will be going to Case Western Reserve in Cleveland for ophthalmology on July 1, 2018."

Theresa Rohr-Kirchgraber, MD '88, was honored as one of the *Indiana Business Journal's* Women of Influence, a program that recognizes those who have risen to the highest levels of business, the arts, community affairs, and public service in central Indiana. Rohr-Kirchgraber, an internist and adolescent medicine physician in Indianapolis, was one of 22 honorees chosen out of over 250 nominations.

1990s

Manoj Abraham, MD '93: "After training, **Kavita Aggarwal, MD '92,** and I settled in New York's Mid-Hudson Valley, where we are raising our two wonderful children, Kiran, 14, and Minali, 13. Kavita practices internal medicine at a large multi-specialty group, with an academic affiliation with the New York Medical College, while I have my own practice, Facial Plastic Surgery/Oasis Medispa, and am academically affiliated with the New York Medical College and the Icahn School of Medicine at Mount Sinai, which gives me the opportunity to teach residents at Westchester Medical Center, where I perform micro-vascular reconstruction. I continue to lead medical missions with Healing the Children Northeast to three or four sites each year and am the recent past president of the New York Facial Plastic Surgery Society, current chair of Face To Face (the humanitarian arm of the American Academy of Facial Plastic & Reconstructive Surgery), and president-elect of the Dutchess County Medical Society. Kavita and I were honored to be selected top docs by *Hudson Valley Magazine*, and I was chosen to be on the cover. Looking forward to upcoming reunions and reconnecting."

Naomi Torgersen '89, MD '94, is married and living in the San Francisco Bay Area. She has two teenage kids. She works for Kaiser Permanente doing office ob/gyn and is

a four-year survivor of advanced breast cancer.

Sheila Partridge, MD '97, is associate chair of the department of surgery at Newton-Wellesley Hospital and medical director of bariatric surgery.

2000s

Poorab Sangani, MD '01, and **Robin Vora '97, MD '01,** have been named co-chairs of ophthalmology at Kaiser Permanente, Northern California. "We lead a group of over 200 ophthalmologists and are tasked with ensuring that every one of our 4 million Kaiser members receives cutting edge, evidence-based, and cost-effective clinical and surgical eye care."

Leslie Diaz Moore, MD '02: "I was married on November 29, 2008, and had a miracle child three years later (despite a severe systemic sclerosis diagnosis that has me on disability and no longer able to practice) on November 17, 2011. Life has been good; praise the Most High."

Jian Shen, PhD '99, MD '02: "I gave three presentations on endoscopic spine surgery at the Society for Minimally Invasive Spine Surgery Annual Forum 2017 in Las Vegas, NV."

Kavita Parikh-Agrawal, MD '04 reports that her husband, **Shantanu Agrawal, MD '04,** was recently named president and CEO of the National Quality Forum.

Lian Sorhaindo-Mack, MD '06: "I am a dermatologist working in my own private practice, GlamDerm Gramercy Laser and Medical Dermatology, in the Gramercy neighborhood of New York City. I live in the city with my husband and daughter."

2010s

David A. Nissan, MD '12: "I did my psychiatry residency at NYP/Weill Cornell. I'm now serving in the US Navy, stationed at Naval Medical Center Portsmouth. I'm currently deployed with the USNS *Comfort* as part of the humanitarian mission to Puerto Rico. I am a psychiatrist on board, taking care of the crew and consulting on civilian patients admitted to our hospital."



Graduate School of Medical Sciences

Mark D. Dibner, PhD '77, is in his 14th year as chairman of Kramden Institute Inc., a 501(c)(3) charity that collects, refurbishes, and awards computers to hardworking students without a computer in their homes. He and his son, Ned, started Kramden in their Durham, NC, basement, awarding 42 computers in 2003. Kramden has now awarded over 29,000 computers and has had 12,500 volunteers (its "Geeks"). In 2017, Kramden awarded 4,000 PCs, had 2,000 volunteers, and taught 2,000 students in its digital literacy classes.

Thomas P. Hopp, PhD '77, is currently president of the Northwest Chapter of Mystery Writers of America, the nation's leading organization of crime and mystery writers. His most recent novel is the natural disaster thriller *Rainier Erupts!*

Mitesh Patel, PA '13: "I am a physician assistant on staff at Baylor University Medical Center at Dallas. I was highlighted in a recent article in *Scrubbing In*: 'Baylor Scott & White Cardiac Surgery Touching Lives in Peru.' Weill Cornell's physician assistant program ingrained the importance of community outreach. Its mission is in line with the PA profession, where

social responsibility is the highest form of accountability. As I said in the article, 'There is no greater satisfaction as a physician assistant than to help the underserved and the underprivileged.' "

Meghan Newcomer, PA '16, works as a private PA specializing in foot and ankle surgery at Hospital for Special Surgery. She will be racing in the World Marathon Challenge (running seven marathons on seven continents in seven days).

Neel S. Madhukar, PhD '17, completed his doctorate in computational biology and medicine from the lab of Olivier Elemento, PhD. Following graduation, he joined the Runway Startup Postdoc Program at the Jacobs Technion-Cornell Institute at Cornell Tech, where he is launching OneThree Biotech, a company developing an artificial intelligence platform to accelerate drug discovery and development.

Mona Khalaj, PhD '18, will be doing a postdoc in the lab of Irving Weissman, MD, at Stanford University School of Medicine, focusing on the role innate immunity plays in cancer cell recognition.

ROAD MOST TRAVELED: Medical student Joshua Bliss '21, who goes on regular photography jaunts along the East River, says he took up the hobby "as a way to ease my mind and escape the craziness and grind of daily life." *Urban Vessels*, which he entered in the 2017 Medical Complex Art Show, depicts the FDR Drive one evening last September. "I did not have a tripod, but used the railing along the pedestrian bridge to steady the shot as I held the shutter for about four seconds," Bliss says. "I wanted to capture the essence of rush hour from a unique perspective."

'41 BA, '43 MD—Henry Tesluk of Sacramento, CA, January 16, 2017; professor emeritus of pathology, UC Davis School of Medicine; attending pathologist at Henry Ford Hospital, the Mason Clinic, and the University of Kentucky; research fellow at the University of Rochester Medical School; one of the early medical officers to visit postwar Hiroshima, Japan; veteran; author; avid reader; fisherman; handyman; watercolor artist; painting instructor; active in community, professional, and religious affairs.

'48 MD—Milton Cooper of Easton, CT, April 29, 2017; chief of hematology and chief of the division of internal medicine at St. Vincent's Hospital; associate clinical professor at Yale; clinical researcher at the Mayo Clinic; served on the board of directors of St. Vincent Medical Center and the board of the St. Vincent's Medical Center Foundation; past president, Connecticut chapter of the American Cancer Society; veteran; recipient of the Bronze Star for Meritorious Achievement; active in professional affairs.

'50 MD—Margaret Dealy Griffel of Menands, NY, December 31, 2015; psychiatrist.

'55 MD—Robert S. Brittain of Ojai, CA, formerly of Denver, CO, September 1, 2017; first physician risk manager in the nation; general surgeon; assisted with the first liver transplant in Colorado; volunteer surgeon at Da Nang Civilian Surgical Hospital for Project Vietnam; taught orthopaedic surgery techniques to physicians at Vietnamese Army Hospital; surgical officer at Orlando Air Force Base; backpacker; fisherman; skier; explored southwest Colorado's Indian habitats; traveled

the Lewis and Clark Trail; active in professional affairs.

'56 MD—William R. Fackler of Tool, TX, July 8, 2017; pediatrician.

'57 MD—W. Thomas London of Wyncote, PA, June 3, 2017; pioneer in hepatitis B research and the development of a vaccine; director of the Liver Cancer Prevention Program at Fox Chase; vice chairman of the board, Hepatitis B Foundation and its Baruch S. Blumberg Institute; served in the Public Health Service at the National Institutes of Health; founder, American Society of Preventive Oncology; editor of scientific journals; gardener; avid reader; taught classes at Cheltenham Township Adult School; yoga practitioner; active in community and professional affairs.

'58 MD—Robert Merin of Wynnewood, PA, August 27, 2017; anesthesiologist; senior resident scientist, Erasmus University, Rotterdam, Netherlands, where he worked on pig hearts; worked at the Medical College of Georgia and the University of Texas Medical Center; editor, *Anesthesiology*; consultant to the FDA; president, Association of University Anesthesiologists; participated in an ophthalmology mission group in Ghana, Vietnam, Haiti, and Nigeria; veteran; author; tennis player; golfer; boater; scuba diver; choral singer; active in community, professional, and religious affairs.

'58 MD—Richard W. Roberts of Willington, CT, May 2, 2016; practiced internal medicine at Grove Hill Clinic and New Britain General Hospital; also practiced at the US Public Health Service clinic on the Navajo Indian Reservation; fisherman; short story writer.

'60 MD—Donn J. D'Alessio of Madison, WI, December 20, 2016; expert on infectious disease epidemiology and the epidemiology of chronic diseases; department chair of population health sciences, University of Wisconsin School of Medicine and Public Health; established the integrated MS/PhD program in population health at the University of Wisconsin; served in the Epidemic Intelligence Service at the Centers for Disease Control and Prevention; helped establish the NIH-funded Wisconsin Incidence Cohort Registry of Type I Diabetes; active in community and professional affairs.

'60 MD—Richard R. Temple of Red Hook, NY, February 3, 2015; ob/gyn in private practice; affiliated with Northern Dutchess Hospital; helped create the Neugarten Family Birth Center; veteran; active in community, professional, and religious affairs.

'61 MD—Gregory G. Dimijian of Dallas, TX, March 15, 2017; psychiatrist; clinical associate professor of psychiatry, University of Texas Southwestern Medical School; served with the Epidemic Intelligence Service of the Centers for Disease Control and Prevention; musician; former ranger at Glacier National Park; studied animal behavior; photographer; published *Animal Watch: Behavior, Biology, and*

Beauty, and For the Love of Wild Places: Finding Adventure and Beauty in Nature; traveler; active in community and professional affairs.

'63 MD—Kuhrt Wieneke of Stephentown, NY, October 6, 2017; orthopaedic surgeon in North Adams, MA; battalion surgeon in the 82nd Airborne; surgeon in the 10th Special Forces in Germany from 1964-66; farmer; pilot; hockey and football fan; car restorer; house builder; model train enthusiast; skier; traveler.

'64 MD—Gary I. Wadler of Port Washington, NY, September 12, 2017; internist; helped establish an inpatient dialysis unit at North Shore; worked to eradicate doping in sports; helped establish the World Anti-Doping Association and served as chair of its Prohibited List Committee; oversaw the development of the medical guidelines for health and training of ballet dancers as chairman of the American Ballet Theatre's Curriculum Medical Advisory Board; advisor to the US Dept. of Justice; vice president, Women's Sports Foundation; tournament physician for the US Open Tennis Championships; active in community and professional affairs.

'66 MD—Robert E. Curran Jr. of Seekonk, MA, May 2, 2017; ophthalmologist; chief of the division of ophthalmology at Memorial Hospital in Pawtucket, RI; clinical

assistant professor of surgery in ophthalmology at Brown Medical School and the Eye Clinic at Rhode Island Hospital; author; active in professional affairs.

'70 MD—Howard Kirtland III of Franklin, PA, July 17, 2017; oncologist; established the Kirtland Cancer Foundation in 2005; Vietnam War veteran; active in community and professional affairs. Wife, Barbara (Grubb), BS Nurs '69.

'77 MD—Robert M. Hemm of Roanoke, VA, formerly of Flagstaff, AZ, and Bennington, VT, May 29, 2015; practiced internal medicine and geriatrics; medical staff member of Southwestern Vermont Medical Center; named Physician of the Year by the Vermont Health Care Association; medical staff member of Tanner Memorial Clinic in Ogden, UT; director of the ICU and chief of staff at Mayo Regional Hospital in Dover-Foxcroft, ME; town health officer; medical examiner for the State of Maine; former chief resident, Greenwich Hospital, Yale School of Medicine; Kiwanis Club member; amateur radio operator; pilot; fly fisherman; boater; skier; linguist; avid reader of English and German literature; music lover; amateur astronomer and meteorologist; active in community and professional affairs.

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Vision Quest

A passionate global health advocate since serving in the Peace Corps, Grace Sun, MD '05, assistant professor of ophthalmology, leads a WCM program that has restored sight to thousands in Tanzania



In college, I wasn't certain that I wanted to become a physician. But as a Peace Corps volunteer, I worked as a community health promoter in a small village in Nicaragua and realized that I could have a real impact on people's lives. One of the main reasons I chose Weill Cornell Medical College was its strong global health program, and that remains a big part of what I do. Worldwide, there are about 37 million people who are blind—who can't see the big 'E' on the chart—and 250 million who are visually impaired. Eighty percent of those cases are reversible. So in 2008, I helped start Weill Cornell's East African Eye Care Project. We travel to Tanzania twice a year and teach medical students, residents, and young ophthalmologists, working alongside them as we take care of patients. In the last few years, we've operated on over 1,000 people and screened three to four times that many.

"Tanzania is a country of 50 million people, but there are only forty ophthalmologists. Many Tanzanians go blind from cataracts because of inadequate eye care, yet we can address those issues in a ten-minute surgery. You really give people their lives back. In

Tanzania, if you're blind, not only can you not care for yourself, but you take another person out of the workforce—or a child out of school—to take care of you. When we remove the patch after surgery, people are sometimes in disbelief: they can see color and their family members' faces. It's joy and laughter and tears. I have a wonderful video of a woman who's just dancing after her cataract surgery, thrilled to be able to see again.

"I remember one patient clearly: a grandmother in her seventies who had an amazing smile. She was blind from cataracts and couldn't feed herself or provide for her family. When we came back a few months after operating on her, we couldn't find her. It turned out she was out in the fields, herding cattle—she was working again. That's a powerful story of how a simple procedure can change someone's life. It's humbling. It rejuvenates your spirit and reminds you why you went into medicine. People come in using walking sticks, guided by a family member; at the end of our time in Tanzania, we have a collection of branches and sticks they no longer need. And that's just incredible." ■

ABBOTT



'Having hope makes all the difference in the world.

The care and attention of the staff at Weill Cornell Medicine gave me hope again.'

Carl Batlin

Carl Batlin and Susan Hinko: **A Legacy Gift of Hope**

Inspired by the extraordinary care he received at Weill Cornell Medicine, Carl Batlin and his wife, Susan Hinko, have established three endowed Clinical Scholar Awards in their wills. Their gifts will support talented faculty in the fields of multiple sclerosis, Alzheimer's disease, and stroke, while providing a legacy in honor of their parents and their physician.

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