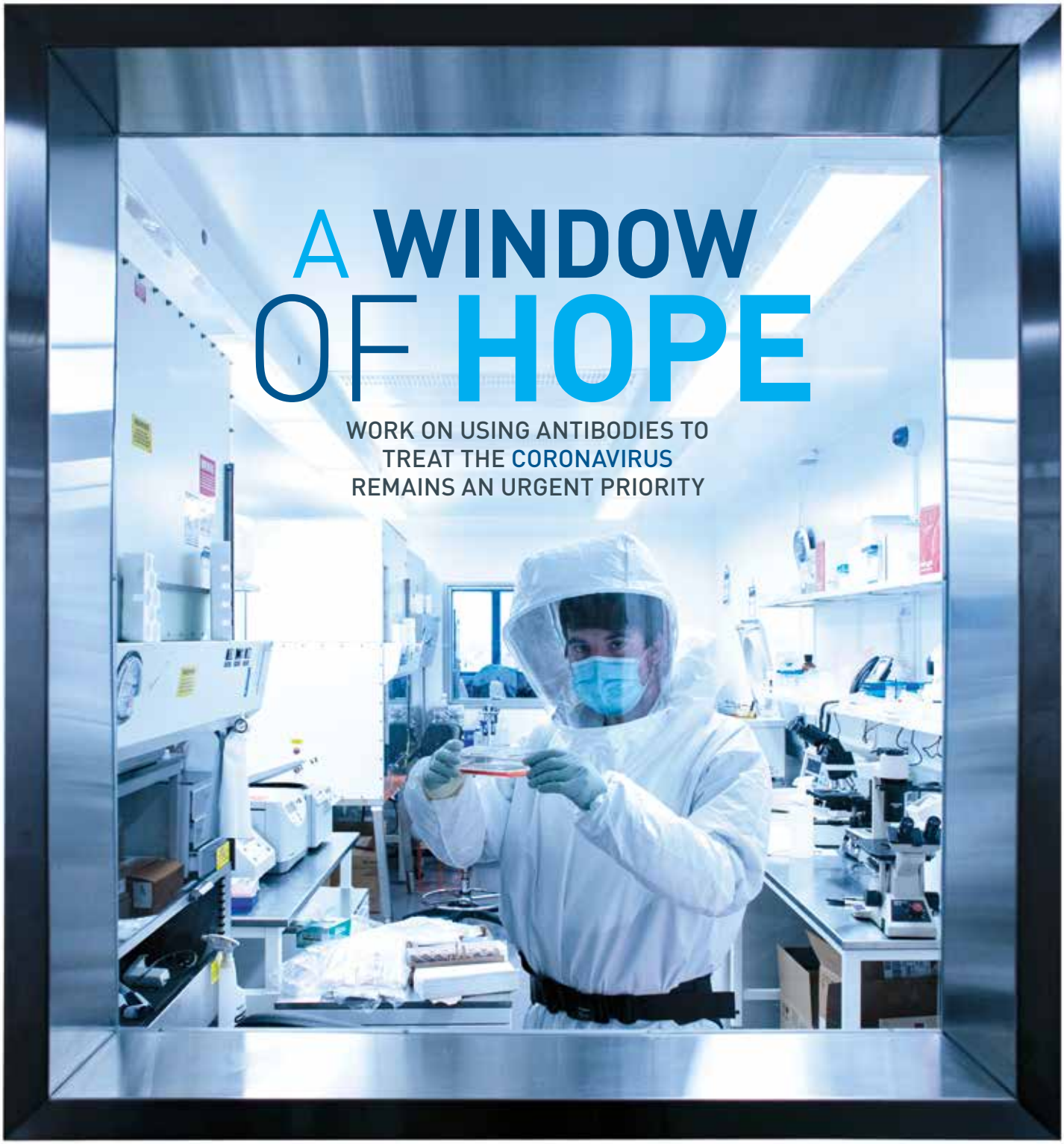
Columbia Medicine

Columbia University Vagelos College of Physicians & Surgeons

SPRING/SUMMER 2021

A Nobelist's Accidental Path

One of Us: Physician Suicide



A WINDOW OF HOPE

WORK ON USING ANTIBODIES TO TREAT THE CORONAVIRUS REMAINS AN URGENT PRIORITY

BARBARA ALPER

Dear Readers,

We have learned over the past year and a few months how quickly things can change, but as I write this message in early spring, I have equal measures of hope and pride to share. Our vaccination program is gaining speed in partnership with NewYork Presbyterian Hospital, as are vaccinations across the country, and we have cautiously made plans to resume something along the lines of normal operations by Fall 2021. Hope infuses our planning for the future.

Pride comes with news about recognition of our leadership in the world of academic medicine. In January, the NIH finalized numbers for grants awarded during the 2020 federal fiscal year, which ended Sept. 30, 2020. VP&S reached its highest ranking ever among medical schools—No. 5. Then in March, the U.S. News and World Report rankings of research-oriented medical schools ranked VP&S tied for No. 4. This, too, is the best showing for VP&S and is a testament to the hard work put in over the past several years to strengthen education, research, and patient care. Nature Index consistently ranks Columbia University Irving Medical Center (CUIMC) as No. 1 or No. 2 for impact of biomedical and health care publications by faculty.

These rankings reflect our leadership in academic medicine, a leadership that extends to our role in COVID-19 testing, treatment, basic research, clinical trials, and vaccines. This issue provides updates on our pandemic activities plus a look at antibody research being conducted on our campus by Dr. David Ho.

Our focus on the pandemic is matched by our focus on ensuring diversity, equity, and inclusion in all that we do. As we implement recommendations of the CUIMC Task Force for Addressing Structural Racism, we are reminded of the discrimination nationally against Asians, Asian Americans, and Pacific Islanders, as well as other groups. Through our actions and our words, we have reinforced our commitment to anti-racism and denounced discrimination, intimidation, or violence directed against any member of our community. We are proud to work in higher education, which is among the most diverse organizations in the nation.

Our leadership in pandemic research and patient care and in anti-racism initiatives has tremendous potential to change lives in our medical center community, in our neighborhood, and beyond. The NIH and U.S. News rankings give us pride in our medical school, but they more importantly provide hope that our work matters and will make a difference. I thank our faculty, staff, trainees, alumni, and community/national/global partners.

With best wishes,

Anil K. Rustgi, MD.

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Columbia University Vagelos College of Physicians & Surgeons

Vol. 41 No. 1
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in this Issue

features

In the Lab: The Hunt for COVID-19 Antibody Treatments

By Christina Hernandez Sherwood

Two researchers with Columbia ties—a faculty member and an MD/PhD graduate—have pioneered ways to use antibodies to treat the coronavirus.

One of Us

By Sharon Tregaskis

The death of a popular emergency room physician and leader a few months after the beginning of the pandemic cast a bright light on physician suicide. Members of her family hope the spotlight will destigmatize mental health problems among health care workers.

26

My Path from Columbia to a Nobel Prize

By Robert J. Lefkowitz'66 with Randy Hall

Robert Lefkowitz'66 won a Nobel Prize in 2012 for his research, but he had not planned on a career as a researcher. An excerpt from his book, "A Funny Thing Happened on the Way to Stockholm: The Adrenaline-Fueled Adventures of an Accidental Scientist," explains his course change.

ON THE COVER: Patrick Loughlin, assistant manager of the high-containment laboratory/biosafety level 3 core facility in the Aaron Diamond AIDS Research Center. Photograph by Jörg Meyer. Article, page 16.

Columbia**Medicine**

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Faculty and staff should contact their departmental administrators to update their addresses, which are obtained through the Columbia University personnel system.

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Letters

Road Map for Anti-racism

The "Road Map for Anti-racism in Health Care" article (Fall/Winter 2020 issue) was of great interest and importance. I wondered, though, why, among the many inspiring initiatives and recommendations listed, there was no mention of advocacy for a system of publicly funded universal health care. Change to such a system would, in and of itself, address not only many of the health care problems resulting from racism but many of the other systemic problems signaled in the article by phrases such as "more just society," "health disparities," "fully inclusive," "social injustice," "foster equity and minimize bias," "population health," "inclusion."

An Occam's Scalpel, so to speak.

Daniel C. Bryant'65

Hospitalists

The two original hospitalists (Fall/Winter 2020 issue) at NYP are both graduates of the VP&S internal medicine residency program and are still on staff in the Department of Medicine here. One is Dr. Douglas Marratta. I am the other.

Roy Lackey'93

BALSO

The Fall/Winter 2020 issue of *Columbia Medicine* describes the founding of the Black and Latino Student Organization (BALSO) at VP&S ("P&S" at that time) in 1972 after a hostile racial slur was found written on the blackboard in a classroom; the incident led to organized sessions to discuss intolerance.

At that time, I was a fourth-year medical student at VP&S (Class of 1973), working in electives in the hospitals at West 168th Street. My first reaction on reading this article was shock, because not only do I not remember any such incident, but also because I recall that the racial atmosphere at VP&S at that time was universally relaxed and mutually cordial.

My second reaction was to wonder whether I had been so wound-up with studying and ward work that I may have completely missed what was going on elsewhere in the school. I also wondered whether I missed it because the administration just did not communicate the event to the rest of the student body.

I feel certain that every one of my classmates whom I knew well would have been outraged if they had heard in 1972 about this racist incident, and they would have been very vocal in their denunciation of it.

Edward Tabor'73

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Photo of the Class of 1921

Gentle Persistence

By Danny McAlindon

2021 Marks Centennial of First Six Women to Earn a Columbia MD

Up until 1917, Columbia University's College of Physicians and Surgeons—by then 150 years old—had admitted no women.

At the turn of the 20th century, P&S, as it was known then, was already lagging behind its peers in coeducation. The University of Michigan medical school was the first in the United States to open its doors to women, welcoming its first female student in 1870. Michigan was soon followed by Johns Hopkins (1893) and Cornell (1898). By 1904, 97 of 160 U.S. medical schools were coeducational. That percentage grew over the next decade.

Columbia may have been content to continue with its all-male medical school for decades, if not for an ambitious young woman who set her mind to changing the tradition.

Gulli Lindh, a Barnard College senior, was fast approaching graduation in the spring of 1917. She had always dreamed of being a doctor, so she began a letter-writing campaign to apply to P&S. Her cause soon found a formidable ally in Barnard Dean Virginia Gildersleeve, PhD, whose 36-year tenure as dean made way for significant advancements in educational opportunities for female students.

Gulli Lindh

And as much as Dr. Gildersleeve proved the perfect ally, Lindh proved the ideal candidate for breaking the glass ceiling at P&S. In her memoirs, Dr. Gildersleeve wrote of Lindh: "I had the perfect candidate for admission, a charming, sensible, and brilliantly able young Swedish woman."

In promoting Ms. Lindh's request to attend P&S, Dr. Gildersleeve called on P&S Dean Samuel Lambert, MD, who was stubbornly obstinate in his refusal. Dr. Lambert immediately offered a litany of reasons that young women shouldn't join his student body. For one, there were no suitable restrooms or locker rooms for women; the existing facilities would have to be completely overhauled to accommodate them.

Ms. Lindh and Dr. Gildersleeve were undeterred, keeping up their gentle but persistent campaign over the course of several meetings. Soon, their tenacity resulted in a challenge. Dr. Lambert called on the Barnard women to raise $50,000 (approximately 1 million in today's dollars) for overhauled facilities to accommodate female students. If they could fund the necessary renovations before the school year began—only months away—he would consider admitting Ms. Lindh and other female applicants.

May Mayers

Ms. Lindh and Dr. Gildersleeve set to work immediately. Ms. Lindh raised a few hundred dollars, and Dr. Gildersleeve called on friends and colleagues to raise a few thousand. They were far short of the $50,000 Dr. Lambert had demanded. Ms. Lindh had already accepted a spot at Johns Hopkins when she visited Dr. Lambert again in July of 1917. She implored him to reconsider, asking that he admit the women in good faith with the promise to raise the rest of the money as they worked toward their diplomas. Lambert again refused.

Two significant things happened next, but it is not known which came first. After several more meetings with Ms. Lindh and Dr. Gildersleeve, Dr. Lambert finally relented. The second fact in the historical record: A check arrived from Texas, signed by an older gentleman who volunteered to pay the needed $50,000.

In the fall of 2017, 10 young women were admitted to Columbia's medical school, and four years later, six women received medical degrees.

Their champion, Gulli Lindh Muller (she married during medical school), graduated first in the class. She was joined by Susanna Haigh (No. 3 in the class), Emma Corwin (No. 5), Dorothea Curnow, Elizabeth Wright, and May Mayers.

A century following their graduation, the Vagelos College of Physicians and Surgeons student body is majority women: 321 women and 309 men as of the fall of 2020. The doors to VP&S were first opened to them by a "charming, sensible, and brilliantly able young Swedish woman" who had always wanted to be a doctor.

Writing of Dr. Lindh Muller's death in 1972, Dr. Curnow wrote, "A pioneer has left us. The College of Physicians and Surgeons is changed because of her. Now, I am the only one left of the original group entering in 1917, and I look back with gratitude to Gulli and her special gift of persistence."

New Vice Dean for Education: Monica L. Lypson

Monica L. Lypson, MD, a national leader in medical education at George Washington University in Washington, D.C., joined VP&S June 1 as vice dean for education. She succeeds Ron Drusin, MD, who retired at the end of 2019 after 11 years as vice dean for education.

Drs. Jonathan Amiel and Lisa Mellman served as co-interim vice deans for education until the appointment of Dr. Lypson.

Dr. Lypson was professor of medicine, vice chair for faculty affairs, and director of the general internal medicine division at GW when she was named to the VP&S vice dean's role in February. Before joining GW, Dr. Lypson coordinated a Department of Veterans Affairs' education program as director of medical and dental education. She joined the VA from the University of Michigan Medical School, where she was professor of medicine, assistant dean for graduate medical education, and interim associate dean of diversity and career development.

As vice dean for education at VP&S, Dr. Lypson will oversee all aspects of the MD program, including admissions, financial aid, student affairs, curricular affairs, and student research. She has pledged to help foster a diverse and inclusive learning environment and to work collaboratively across CUIMC to ensure that learners engage in interprofessional didactic and clinical educational activities that address societal needs and promote equitable, high-quality health care for all patients.

A graduate of Brown University, Dr. Lypson received her MD degree from Case Western Reserve University School of Medicine and her master of health professions education degree from the University of Illinois at Chicago. She is board-certified as a general internist who completed her training in the internal medicine-primary care residency program at Harvard Medical School and as a Robert Wood Johnson Clinical Scholar at the University of Chicago.

She became president of the Society of General Internal Medicine in April and is an associate editor for the journal Academic Medicine.

Medical Students Start New Emergency Medicine Clerkship

By Rose Spaziani

Second-year medical students transitioning to their major clinical year in January had a new clerkship among their rotations: emergency medicine. The clerkship gives students a glimpse into the inner workings of the emergency department, from the variety of pathologies seen by ED physicians on any given day to the skills needed to examine and stabilize patients in distress, while providing comfort and compassion.

"Emergency medicine is a safety net for millions of Americans across the country," says Devjani Das, MD, associate professor of emergency medicine at CUMC and director of the clerkship in emergency medicine. "ED physicians see people regardless of their insurance status. The pandemic has only highlighted the importance of emergency medicine in the health care system."

The emergency medicine clerkship assigns students to clinical shifts on NewYork-Presbyterian sites at the Columbia campus and at the Allen Hospital over a two-week period. Students work one-on-one with emergency medicine attending physicians during their clinical shifts, including one shift where they work with a nurse and shadow a resident who sees critical care patients. VP&S faculty have developed didactics that include in-person teaching, case-based scenarios, simulation center sessions, hands-on ultrasound training, and asynchronous modules.

Safety measures around the pandemic include PPE and limiting areas of the emergency department to one student per area to avoid overcrowding.

Brandon Vilarello, a medical student who was among the first to complete the emergency medicine clerkship, recalls arriving in the ER at 8 a.m., donning PPE, and keeping an open mind so he would be prepared for anything. He spent his eight-hour shift interviewing patients, presenting treatment proposals to physicians, and observing and assisting with procedures.

"When one imagines an emergency, it is easy to picture chaos and uncertainty," says Mr. Vilarello. "Something extraordinary about emergency medicine is the systematic way that ED docs approach their patients. Not only are they able to distill chaos into order, but they are exceedingly good at methodically evaluating patients for the 'can't miss' diagnoses, the ones that can lead to great harm if untreated."

Planning for the clerkship began over a year ago. Faculty led the clerkship's design and sought input from students serving on

curriculum development committees. Dr. Das was tapped to direct the clerkship in April 2019. "This role seemed like a natural next step," she says, as it builds on her experience as director of ultrasound for undergraduate medical education in the Department of Emergency Medicine.

For students, the vital role of emergency medicine has been complemented by the urgency of the pandemic. "The most rewarding part of this clerkship was the opportunity to step into the shoes of the front-line physicians and workers who have been battling the COVID-19 pandemic since its beginning," says Mr. Vilarello. "This experience has given me great appreciation for what they have done over the past year. It is incredible how they witnessed COVID-19 as it went from an unknown illness to a nearly ubiquitous phenomenon while developing successful diagnostic and treatment strategies."

According to the Association of American Medical Colleges, about 60% of medical schools have an emergency medicine clerkship, but Dr. Das says most of the clerkships occur in the fourth year. "The unique quality of what's happening at Columbia is that we're instituting this clerkship earlier in medical school during major clinical year," Dr. Das says. "This early exposure is incredibly valuable for students to see firsthand the vital role of the emergency medicine department in the health care system."

Class of 2023 Begins Major Clinical Year

The second-year medical students in the Class of 2023 celebrated their transition to patient-centered training at a ceremony on Jan. 7. The transition was marked at the Steven Z. Miller Student Clinician's Ceremony, which was held virtually for the first time as the COVID pandemic continues. For these students, clinical rotations will be the same as in previous years, with the addition of an emergency medicine clerkship for all students.

"After months of mostly remote learning and the devastating impact of the COVID pandemic on our community, city, and country, the students are especially eager to begin their major clinical year and contribute to the care of patients," says Lisa Mellman, MD, interim co-vice dean for education and senior associate dean for student affairs at VP&S.

Since 1998, the ceremony has marked the move of medical students from classroom education into hospital and ambulatory settings, including NewYork-Presbyterian Hospital.

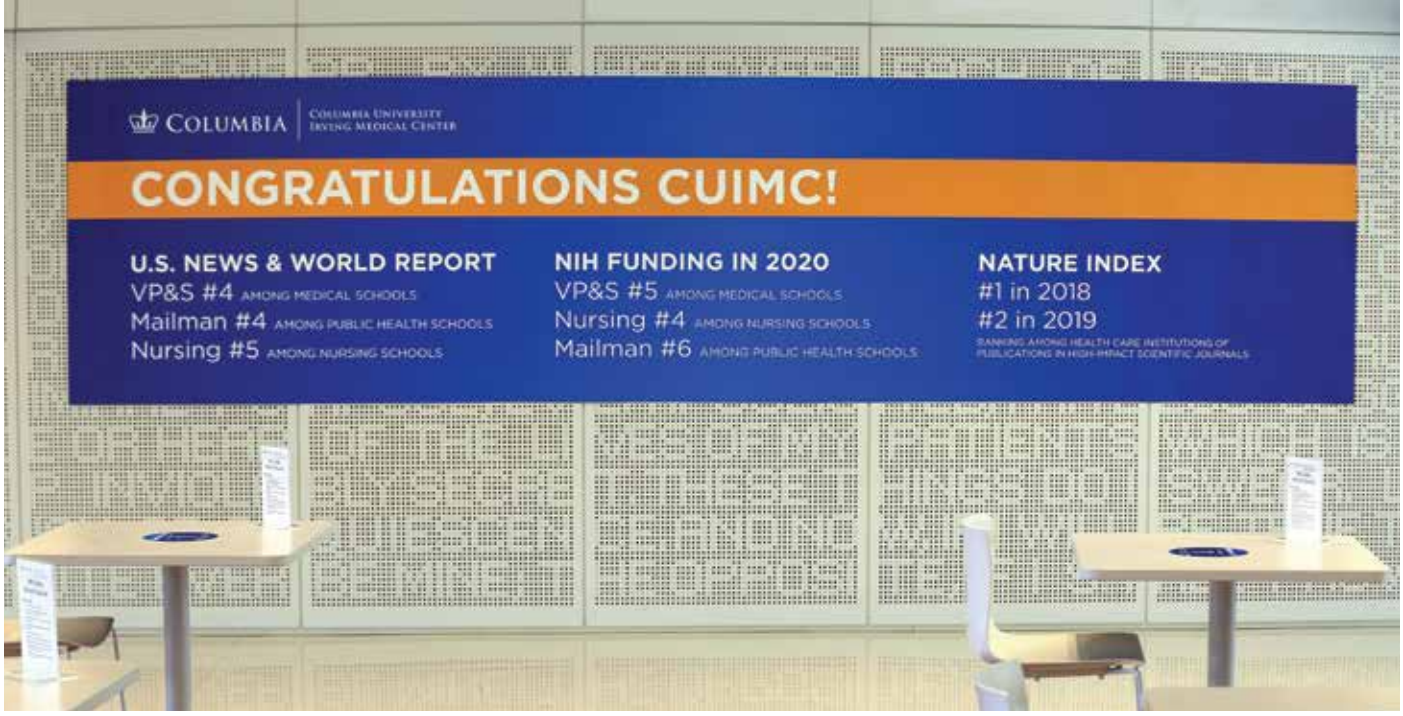
"You're already becoming the physician you're going to be," said William Fuller, MD, assistant professor of medicine at CUMC, who gave remarks to students from the clinical faculty during the ceremony. "Make it someone you're proud of. That's your mission."

During the ceremony each year, awards are given by the class making the transition into patient-centered education and by the class that just finished its major clinical year.

The Class of 2023 awarded the Greg Grove Award to Erika K. Mitsui. The award is given to a student who is generative and well-liked, has contributed to the school's community and fellow students, and enjoys the outdoors, reading, and music. Ms. Mitsui is a violinist and co-leader of the medical school's Musicians' Guild, which moved its live Musical Monday performances online during the pandemic to bring comfort to the Columbia community.

The Class of 2023 honored its teachers by giving Rachel J. Gordon, MD, associate professor of medicine and epidemiology at CUMC, the Fundamentals Outstanding Teacher Award, which recognizes classroom teaching.

The ceremony is named for Steven Z. Miller'84, who founded the first transition ceremony at VP&S. Dr. Miller was the Arnold P. Gold Associate Professor of Pediatrics at VP&S and a national leader in humanism in medicine; he died in a plane crash in 2004.



MICHAEL DIVITO

VP&S in Top Five of New Rankings

In two national rankings announced this year, VP&S reached the top five, its best showing in both rankings—No. 4 in the U.S. News & World Report's ranking of research-oriented medical schools and No. 5 in National Institutes of Health funding.

NIH funding was finalized in January 2021 for the federal fiscal year that ended Sept. 30, 2020. VP&S received $496 million in NIH funding, enabling its jump from No. 9 in FFY19. Since FFY09, VP&S has moved from No. 14 to No. 5, the largest increase among the top 10 medical schools. The $496 million in NIH funding for FFY20 is an 18% increase from FFY19 and a 119% increase since FFY09, when NIH grants to VP&S totaled $227 million. Of the $496 million, $6 million was granted for COVID-19 research. Much of the COVID-19 research conducted at VP&S during 2020 was subcontracted through grants to other universities and is not reflected in the total VP&S received.

Among New York City medical schools, VP&S is the only school ranked in the top 10 in NIH funding for FFY20.

The U.S. News & World Report ranking of graduate schools was announced in late March. Among research-oriented medical schools, VP&S ranked No. 4 in a tie with Stanford and the University of California, San Francisco.

"These rankings are testimony to the work of our entire medical school community, and we are especially indebted to Dean Emeritus Lee Goldman, who frequently reminded us that VP&S was indisputably in the top five medical schools," says Anil K. Rustgi, MD, interim executive vice president and dean of the Faculties of Health Sciences and Medicine at Columbia. "The rankings confirm the leadership of our education, research, and patient care and put us undoubtedly among the eminent medical centers of our nation."

New Lecture Series Focuses on Science and Health Equity

Implementation of recommendations made by the CUIMC Task Force for Addressing Structural Racism in the Health Sciences includes a lecture series to raise awareness of racial/ethnic health disparities and their solutions, accelerate research, train and nurture future researchers for this work, and help develop a network of researchers and scientists who focus on this work.

The Office of Faculty Professional Development, Diversity and Inclusion hosts the presentations in the new Columbia Science and Health Equity Lecture Series. The inaugural event on Jan. 26 was presented by Eliseo Perez-Stable, MD, director of the National Institute on Minority Health and Health Disparities at the NIH, who spoke on "National Institute on Minority Health and Health Disparities Research Framework."

The series will connect Columbia scholars with scholars from other institutions whose work focuses on key aspects of health inequity, with a goal to build and incentivize transdisciplinary collaborations among health disparities researchers.

Other lecture topics will cover COVID-19 and populations of color; the Irving Institute for Clinical and Translational Research model for integrating the impact of disparities into all community participative research; space/place-based determinants of disparities; epigenetics and molecular mechanisms in health care disparities; the role of genomics, genetics, and precision medicine in addressing health disparities; and social determinants of health.

COVID-19 *news*

COVID-19 continues to be a priority in the day-to-day life of the Vagelos College of Physicians and Surgeons. These updates provide only a sample of the ongoing COVID-19 research, patient care, and educational response at VP&S, the medical center, and its primary hospital partner, NewYork-Presbyterian. More news about COVID-19 can be found at www.cuimc.columbia.edu/news/topics/infectious-diseases/covid-19.

ISTOCK

CopeColumbia: Helping Each Other

As COVID-19 descended on New York City last year, many health care workers sought support to help them through a time of unprecedented stress and uncertainty. In the aftermath, mental health professionals have had the opportunity to reflect on the tremendous pressure brought on by the pandemic and the medical center's response. CopeColumbia led the way to help faculty and staff most affected by the pandemic.

Lourival Baptista-Neto, MD, vice chair for clinical services in the Department of Psychiatry, oversees CopeColumbia with Laurel Mayer, MD, Claude Mellins, PhD, Aaron Vieira, and other colleagues in psychiatry. The faculty-led initiative helps Columbia employees through counseling sessions, peer support groups, and other resources for managing stress, fear, and anxiety.

"After the first week of quarantine, you could already feel the temperature across the medical center rising—the level of anxiety and apprehension," Dr. Baptista recalls. He reached out to senior leaders across the medical center with a simple message: We have to be ready, and we have to respond.

The Department of Psychiatry partnered with ColumbiaDoctors and NewYork-Presbyterian to develop CopeColumbia. The initiative immediately began providing critical support across all schools and departments, including one-on-one virtual counseling sessions and faculty-led peer support groups. The program's goal: Build resilience, reinforce self-care, and provide an outlet for the stress and anxiety associated with the COVID-19 pandemic.

Demand has grown in the months since CopeColumbia launched, and support from colleagues has risen as well, Dr. Baptista says. "We have been lucky to have a lot of our faculty volunteering. They want to be available to support their peers."

Needs evolved month to month as the pandemic progressed, Dr. Baptista says. At its onset, sessions were dominated by anxiety, uncertainty, and fear. Health care workers expressed concern over rising patient admissions, climbing death rates, lack of resources, and concern for their families. Many were dealing with the shock of unprecedented new challenges.

Six months later, sessions started to focus more on adapting to a new reality. Dr. Baptista and colleagues addressed anticipatory anxiety stemming from reopening and the uncertainty surrounding the potential of a second surge. Meanwhile, many were seeking support amid mounting stress and frustration related to how the virus had been politicized and containment strategies at a national level. Others were coping with delayed trauma and grief reactions from earlier in the pandemic, including symptoms of depression, anxiety, and post-traumatic stress. CopeColumbia also has responded to requests for resources related to trauma or anxiety due to racial and social injustice and the growing awareness of racial disparities revealed by the pandemic. "Our focus has been on the racial injustice's impact on the well-being and mental health of our staff," says Dr. Baptista. Specifically, the CopeColumbia team has addressed concerns surrounding the unequal risk for COVID seen in patients and at home by faculty and staff of color; fears of discrimination inside and outside of the workplace; and concerns for the safety of sons, spouses, and male relatives of color.

"Our people are remarkably strong and resilient, but we have to acknowledge that some are still suffering," says Dr. Baptista. "We know that the psychological footprint of disasters and pandemics exceeds the medical footprint. Needs are as diverse as they are abundant. The challenge lies in responding and finding the right resources for each group. As a system, we are all reacting and still adapting in some way. There's a lot of grief, fatigue, trauma, and anxiety, but there is also a lot of hope and undoubtedly growth. We are stronger now as a system."

CopeColumbia has widened its scope, maintaining the original resources offered but also starting to work with teams from a different angle. "We are focusing on working with leaders and managers on the impact that their behavior has on the collective well-being of their teams and the organization. In addition to awareness and information, we are offering more concrete skill-building and training. That work focuses on recognition and validation, as well as team-building, connection, and self-care."

Homebound: Pandemic Takes Project STAY to Youth Where They Are

By Sharon Tregaskis

For more than 30 years, Project STAY has provided confidential, wrap-around services for youth affected—or infected—by HIV and other sexually transmitted infections. Each year thousands of young people connect with Project STAY through New York City high schools, colleges, workforce development agencies, organizations serving justice-involved youth, and programs providing supportive care for LGBT youth.

"The main focus of our work is to address high rates of HIV and STIs throughout New York City and particularly in northern Manhattan," says Alwyn Cohall, MD, director of Project STAY and professor of pediatrics at VP&S and the Mailman School of Public Health. He also directs the Harlem Health Promotion Center, which runs Project STAY in partnership with the Mailman School of Public Health, NewYork-Presbyterian Hospital, the New York State Department of Health, and the New York City Department of Health and Mental Hygiene.

The team's outreach work is year round but reaches its peak in early spring in what the team has taken to calling "March Madness" for the frenetic pace of screening events that happen during that month. In March 2020, however, as schools and businesses throughout metro New York shuttered to flatten the curve of COVID-19 cases, those services ground to a halt. "We had to put the brakes on because we couldn't go out in the field, and our community partners stopped delivering services," says Dr. Cohall, who says even the Project STAY medical clinic at NewYork-Presbyterian saw visits plummet as New Yorkers hunkered down at home.

"But we had a situation where young people were at high risk for sexually transmitted diseases, HIV, and unintended pregnancies because they continued to have sex, and—because of COVID-19 and its impact on their families and social networks—they were also having increased mental health issues," says Dr. Cohall.

Most of the team's volunteer health educators are pre-medical, nursing, MPH, and social work students at Columbia who are trained by Project STAY leadership to provide sexual health education, risk assessment, screening, and information about the Project STAY clinic at NYP. As those volunteers traveled across the country to shelter in place with their families, Renee Cohall, LCSW-R, the program's director of outreach, started overhauling the team's work flow and, in partnership with colleagues at NYP's Comprehensive Health Program and the NYC Department of Health and Mental Hygiene, began figuring out how to provide at-home HIV and STI screening.

The health educators became case managers with a caseload of clients. They conducted individualized intakes with clients over the phone, helping clients assess the psychosocial supports they would need before learning their HIV status. "Because we were no longer tied to certain hours that we could communicate with clients in the community, the staff really opened up their hours," says Ms. Cohall. "If a client needed to connect at 10 p.m. or over the weekend, we could do that. Some of our clients were essential workers, so they still had commutes and shifts during the day that limited their ability to take personal, confidential calls."

On May 1, 2020, Project STAY mailed its first at-home HIV test. Like a home pregnancy test, the screening provides rapid results. Health educators not only developed a how-to guide in English and Spanish to accompany the test, says Ms. Cohall, they also answered questions about how to collect the requisite swabs and even stayed on the phone with clients during the tense 20-minute wait if the client wanted them to. In June 2020, Project STAY added at-home STI testing in partnership with NewYork-Presbyterian Hospital. "The home testing filled a tremendous void," says Dr. Cohall, when the majority of New York City's sexual health clinics were closed.

For one client, a Long Island resident, Project STAY facilitated access to a prescription for an STI diagnosed before the pandemic. The young man's pharmacy had converted to drive-through only, but the youth didn't have access to a car and the pharmacy prohibited pickups by pedestrians. Dr. Cohall and a health educator persuaded a pharmacist to make an exception and let the youth in the door just long enough to hand him his meds. Another health educator helped a client who had multiple housemates strategize about how to get the privacy he needed to collect samples and await results. "It can be empowering for patients because they control the testing process," says Dr. Cohall of the at-home approach. "There's literature to suggest that patient swabs are just as reliable as those taken by providers."

In addition to sexual health, other issues were identified. "As we started reaching out, we found much more in the way of need," notes Ms. Cohall. The health educators identified a client whose father died from COVID; he subsequently became very depressed and began using substances to cope with his loss. The team successfully linked him to mental health services.

Similar to HIV and STIs, COVID has disproportionately affected communities of color. To address the need to enhance COVID screening, the Cohalls in June 2020 were part of a team that collaborated with community partners (Alliance for Positive Change and Argus Community) along with colleagues from the New York State Psychiatric Institute (Dr. Kate Elkington) and the NYP Comprehensive Health Program (Dr. Peter Gordon) to strategize how to collectively leverage what had been learned over three decades of HIV/

STI outreach to improve COVID education and testing. That led to a grant, RADx (Rapid Acceleration of Diagnostics), from the NIH. "We're using the medical center as a home base, which combined with our extensive network of partners, has tremendous potential to provide screening, support, and appropriate services to vulnerable populations," says Dr. Cohall. "The added value of these community partnerships is the development of trust and respect, critical ingredients necessary to promote vaccine awareness and utilization."

In addition to establishing strong community connections, says Ms. Cohall, Project STAY is enhancing the public health workforce by creating opportunities for Columbia students from various disciplines—medicine, nursing, public health, and social work—to learn firsthand about the impact of social determinants on the health of community residents. "These experiences will profoundly shape their future practice and interactions with patients."

COVID-19 Research Projects Benefit from Student Participation

By Danny McAlindon

When in-person learning and nonessential research operations were halted last year because of the pandemic, medical students whose clinical activities were suspended and faculty who could not continue their research joined forces to redirect their time and talents to COVID-19 research.

Researchers with diverse areas of focus—in everything from influenza to afflictions of the heart and lungs—launched emergency research projects to try to answer questions about the mysterious pathogen raging around the globe. For projects of this scope and urgency, they needed help.

"We had this dual problem: all these very motivated students with nothing to do and researchers trying to rev up an unprecedented emergency research operation," says William Bulman, MD, associate professor of medicine and director of the VP&S Scholarly Projects Program.

The two problems shared a single elegant solution. Dr. Bulman met with Elizabeth Shane, MD, professor of medicine and senior associate dean for student research, and with the help of scholarly projects coordinator Karina Winn worked out the logistics of swiftly pairing researchers with students.

"We turned on a dime," says Dr. Shane. "We began seeking opportunities for students to assist with research, even though they couldn't do their clinical work. The students wanted to help and many had useful research skills and medical knowledge. Faculty members needed assistance. It was such a chaotic time, but our faculty really came through and the students did as well."

The matchmaking was made easier by the experience the scholarly projects team built in helping students fulfill their requirement to complete a research project during medical school. And in a remarkably short period of time, the pairings began producing published research. "Very rapidly, these teams began to produce papers at a pace that's unusual for clinical publication," says Dr. Bulman. "There was a sense of urgency. If we were going to learn more about COVID-19, we needed to share our knowledge quickly. By summertime, there were already some very high-level published papers co-authored by students who had contributed meaningfully to that research."

"We're a very student-oriented medical school," says Dr. Shane, "and we do the best we can to make sure students have the best experience possible. That includes learning about research, how scientific discoveries in medicine are made, and incorporating that learning experience into their future careers as physicians."

Students contributed to research on a wide swath of diverse topics—everything from the early predictors of mortality in patients hospitalized with the disease to the distinct antibody responses in children and adults across the COVID-19 spectrum.

Karen Gambina, a fourth-year medical student who has since graduated, was an author on a paper published in Seminars in Oncology for her research group's work on the prolonged detection of SARS-CoV-2 in patients receiving cancer therapy.

"It was a great experience," Dr. Gambina says. "The researchers were very welcoming and glad to have me join and help out in any way I could with the project."

Dr. Gambina and the team completed their research in October 2020, and the paper was published two months later. "COVID-19 has been terrible for a lot of reasons, but it's been great to see my classmates step up to the challenge," she says. "Even though not all of us have been able to be in the hospital, we've at least been able to do our part from the sidelines, whether it be volunteering, calling patients, doing research, or any other number of activities that I've seen my classmates engage in."

Dr. Bulman is compiling a list of students who volunteered their time to research during the pandemic. The list of more than 100 names includes dozens who have been listed on published papers. The list continues to grow as more of the research that included students is published.

"People should hold this list up and say, 'Look at what our motivated medical students can do. Look at the help they can bring when they're needed,'" Dr. Bulman says. "We have great students at Columbia. While they are here to learn, they also really help us advance science. We really value what we can learn from them."

MICHAEL DIVITO

A community member gets vaccinated in April 2021 at a pop-up vaccination site at Columbia's Community Wellness Center on the Manhattanville campus

COVID Vaccination Program Reaches Health Care Workers, Faculty, Staff, Trainees, and Community

From mid-December 2020 through mid-April 2021, Columbia and NewYork-Presbyterian vaccinated 150,000 New Yorkers, including Columbia faculty, staff, students and community members.

Jordan Foster, MD, assistant professor of emergency medicine, was the first physician vaccinated at Columbia. "I feel hopeful and grateful. The vaccine is an important step in getting our community, and similar communities throughout the country, to a level of immunity that can allow us to resume the relationships and interactions that we too often took for granted," Dr. Foster said after receiving the first dose.

EILEEN BARROSO

Vaccination of front-line workers began in December 2020 and continued into 2021.

In mid-January, NYP opened a mass vaccination site at the Armory at 168th and Fort Washington with about 70 vaccine stations. Columbia volunteers helped staff the site to administer vaccines, assist with navigation and registration, and translate for non-English speaking New Yorkers who arrived for vaccines. At the Armory site, NYP reserved at least 60% of appointment slots for eligible residents of the Washington Heights, Inwood, Northern and Central Harlem, and South Bronx communities. To engage the neighboring communities, NYP partnered with more than 40 community-based and faith-based organizations to identify ways to provide access, overcome vaccine hesitancy, and address persistent health inequities.

Eligibility expanded at the Armory site to include all New Yorkers. The site was scheduled to operate through May 2021; by March, physician practices assumed primary roles in vaccinating patients. Columbia started opening multiple sites in March to give Columbia patients, faculty, staff, and students more options for vaccinations.

In April, hundreds of New Yorkers from Harlem, Northern Manhattan, and Morningside Heights were vaccinated at a community pop-up vaccination site organized by Columbia's Community Wellness Center on the Manhattanville campus and ColumbiaDoctors. The event resulted from partnerships between Columbia and multiple public and private health care providers.

Columbia and NYP have taken a number of steps to address vaccine hesitancy. The hospital created a speakers' bureau of experts to make educational presentations on the importance and safety of the vaccine. Columbia created a vaccine champions program to train CUIMC employees to offer one-on-one peer conversations and support to their colleagues who have questions about the vaccine. Several Columbia faculty and staff participated in a series of public service announcements for a New York state "Roll Up Your Sleeves" education campaign.

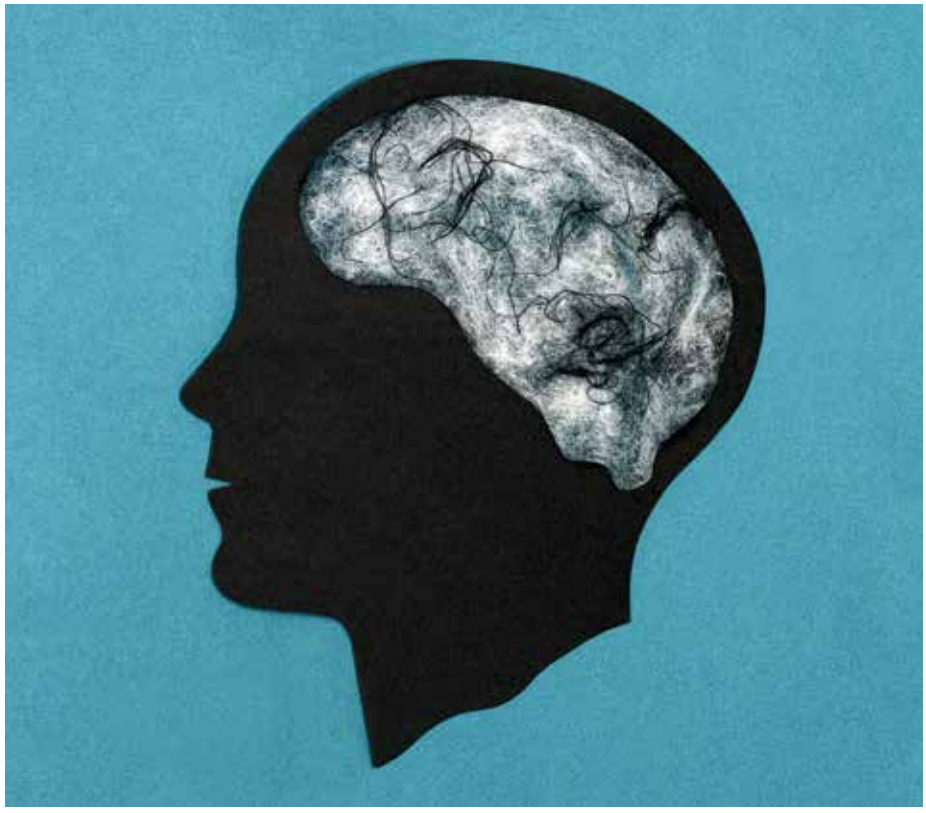
A series of virtual town hall meetings brought Columbia experts and community health workers together to discuss vaccines, dispel misinformation about the vaccines, and build trust between the medical center and its surrounding communities.

"COVID-19 Fog" in Mild Cases

When COVID-19 patients started inundating New York City hospitals in March 2020, Anna Nordvig, MD, a neurologist and postdoctoral clinical and research fellow who specializes in cognition and behavior, organized a group of Columbia neurologists to review what was known about the neurological effects of other coronaviruses.

Their review alerted neurologists to watch out for lingering neurological and psychiatric issues in all COVID-19 patients, including those whose symptoms were mild and never required medical attention.

"COVID-19 manifests with many different symptoms," says Dr. Nordvig, who sees patients in the Department of Neurology's memory clinic. "Some may escape detection. It may be hard to distinguish what was caused by inflammation from the virus and what was caused by the hospitalization. Patients may not even think to mention certain symptoms to their doctor. To understand the prevalence of persistent neurological symptoms, we need to cast a wide net. Patients and their primary doctors can help this effort."



13-SMILE / GETTY IMAGES

During the summer of 2020, Dr. Nordvig said the clinic saw a trickle of patients who had symptoms more serious and persistent compared with the typical brain fog one might experience after a sleepless night. These patients included some in their 20s and 30s. "We're not seeing a deluge of patients, but I worry that the people we're seeing are those most attuned to the latest developments about the disease. Some people are just waiting for their symptoms to pass and not getting the help that could alleviate some of their issues."

At the beginning of the pandemic, doctors in China reported that about a third of patients hospitalized had acute neurological symptoms. The initial epicenters—Asia, Europe, the U.S. coasts—are now following patients for persistent symptoms, such as fatigue, inattention, poor concentration, difficulty working long hours, difficulty getting out of bed, a "brain fog."

"This is similar to what small studies reported in survivors from the first SARS virus," says Dr. Nordvig. "Some also have more specific thinking and behavior problems—they forget the names of people they know well, they can't follow along during business conversations, prioritizing and planning is suddenly difficult, they are inexplicably anxious and sleep poorly.

"Similar to the first SARS virus, patients are experiencing unusual persistent symptoms. Everyone has heard about the loss of smell and taste in COVID-19 and other viruses; we're also seeing changes in appetite, lightheadedness, body discomfort, and new or worsened headaches that don't always respond to traditional pain relievers. These are young and middle-aged people who were previously thriving. Now they are having profound changes in the way they think and feel. They're worried about their careers if this persists. The good news is that most of the patients we're seeing are getting slowly better, but it takes time and focus."

The patients coming to the memory clinic are often seeking physicians who have seen this before. "They didn't go to the hospital when they had COVID-19, and they don't have other long-term effects, so they are surprised to have these neurological symptoms. The most common thing I hear from patients is, 'I'm so glad to know that someone has heard of this.'" To help answer these questions, Dr. Nordvig and colleagues published a review this spring in Nature Medicine on post-acute COVID sequelae.

The severe inflammatory response and cytokine storm seen in COVID-19 suggests that COVID-19 symptoms may not all be caused directly by the virus. In hospitalized COVID-19 patients, the effects of systemic inflammation on the brain seem more profound compared with other common infections, such as the flu. The level

To read more about Columbia's clinical, research, and educational response to the pandemic, visit the CUIMC Newsroom's COVID-19 topic page: **www.cuimc.columbia.edu/news/topics/infectious-diseases/covid-19.**

of inflammatory markers in the blood are often severe, but largely during the initial infection. "I'm not yet convinced that the virus invades the brain's neurons or its other cells. I think it is more likely that this vast, systemic inflammation affects many organs including the brain and the immune system within the brain, and changes the way the brain extracts nutrients and signals."

Dr. Nordvig says reports published by Columbia neuropathologists over the past year provide clues that immunological brain changes may be occurring even without infection of the brain cells themselves.

She presented data from the first 30 patients in her clinic cohort at the BRAIN Conference in London in March and at the American Academy of Neurology conference in April. Dr. Nordvig will be moving to Weill Cornell in September to build an expanded post-COVID "brain fog" clinic and research program.

How Pediatric Tracheostomy Management Helped Adult COVID-19 Patients

The pediatric tracheostomy care program developed by Susannah E. Hills, MD, in 2018 proved to be invaluable during the pandemic when Dr. Hills and her colleagues quickly transitioned their services to help the large number of hospitalized adults needing breathing support.

The creation of a tracheostomy care program for children, one of only a few such comprehensive tracheostomy programs in the country, established a standardized and consistent way to manage patients with tracheostomies in the hospital and to ensure follow-up and close monitoring after their return home. Tracheostomy can be an intermittent treatment for children until they outgrow ventilator dependence or undergo surgical correction of an anatomic obstruction to breathing. For others, tracheostomy may be a long-term part of life.

Dr. Hills, assistant professor of otolaryngology/head & neck surgery, specializes in endoscopic airway surgery, airway reconstruction, and tracheostomy care. The program at NewYork-Presbyterian's Morgan Stanley Children's Hospital provides patients and their families with a support system that features a comprehensive team of specialists to promote optimal breathing, feeding, and speech/language development. A tracheostomy care coordinator helps families bridge the transition from inpatient to outpatient care.

The hospital protocols Dr. Hills and her team established for nurses, respiratory therapists, and physicians on management of pediatric tracheostomy provided a template for addressing adult COVID-19 patient care. "When the pandemic hit, we performed over 170 tracheostomies; that's almost as many as we would do in the adult hospital in a typical year," says Dr. Hills. "The COVID-19 pandemic demanded and inspired a team-oriented response. We came together from across our hospital system to form a tracheostomy care team in expectation of the dozens—possibly hundreds—of patients we would need to care for."

The team included ENT surgeons, thoracic surgeons, critical care surgeons, anesthesiologists, intensive care doctors, speech and language pathologists, and respiratory therapists.

Dr. Hills led a team in postoperative management of the hospital's tracheostomy patients, the Safe Tracheostomy Aftercare Team (STAT). "Once we had the tracheostomies in place, the challenge was keeping those patients safe." A rotating team, including Dr. Hills, an attending surgeon, a lead physician assistant, and five volunteer medics from military special operations forces, oversaw post-tracheostomy care and developed a protocol to help patients decannulate in a safe but expedited way.

"On a typical day amid this outbreak, the rotating surgical and anesthesia teams would go from patient to patient at bedside—sometimes as many as seven or eight—surgically entering the airway and placing the tracheostomy tube," says Dr. Hills. "The STAT team would go from bed to bed, checking on the patients that already underwent surgery, making sure their tubes were secure and that they had the supplies they need nearby."

As patients were well enough to have their tracheostomy tubes removed, the STAT team initiated afternoon decannulation rounds, and over 60% of the COVID tracheostomy patients from the spring were able to leave the hospital breathing on their own, without a tracheostomy tube.

Dr. Hills and her team continue to follow these COVID tracheostomy patients, even months after their discharge. "We're seeing some patients do really, really well: They're at home, living their lives. Some are even back to work. But many others are still struggling with fatigue, shortness of breath, weak voice, neuropathy, and anxiety. It's going to be a long road for many of them.

"Our goal was to keep patients safe after surgery and then to discharge them either to their home or more often to a rehabilitation facility without the trach tube," says Dr. Hills. "All of our efforts on the pediatric and the adult side stem from our desire to give our patients the very best care that we possibly can and to keep them safe during their hospital stay. But we're also striving to address all of the important issues that persist when they leave—quality-of-life issues, such as swallowing and voice and working towards decannulation—when it's possible. Families need to be empowered with resources and education so that they don't feel alone. If we can provide this kind of support to our patients, then I'll consider our program a success."

New devices, procedures, guidelines for clinicians

Clinical advances

Columbia Primary Care Expands in Manhattan, Westchester

More than a dozen ColumbiaDoctors primary care providers are now practicing as the Primary Care Initiative continues to expand to new locations in New York City and Westchester County.

Initiated in 2019, Columbia Primary Care reaches patients across the New York metropolitan area where they live and provides access to Columbia's world-class network of more than 2,000 medical specialists and NewYork-Presbyterian, the only hospital in New York City ranked in the top five by U.S. News & World Report.

"One of the strengths of primary care is that we develop relationships with our patients," says David Buchholz, MD, the senior founding medical director of Columbia Primary Care. Dr. Buchholz joined ColumbiaDoctors in 2019; he previously served as medical director of provider and customer engagement at Premera Blue Cross near Seattle and as executive medical director of UCSF Primary Care in San Francisco before that.

ELIZABETH DERBY

Primary care doctors not only see patients when they are ill; they anticipate issues and help catch disease early when it is most treatable.

"Having a primary care provider means having a team who is thinking of you and your health even when you're not in our office, even when you're not sick," Dr. Buchholz says.

Along with a new location on the Upper West Side of Manhattan, Columbia Primary Care Midtown opened in October at 51 W. 51st St. and will expand this year. In Westchester County, Columbia Primary Care pediatricians with a wealth of experience in the area began seeing patients in Tarrytown and Bronxville. Primary care physicians and nurse practitioners also are available on the Columbia University Irving Medical Center campus.

In the next three years, Columbia Primary Care aims to hire about 50 primary care providers and associated support staff and partner with specialty departments to better serve new patient populations.

With personal relationships between patients and providers critical in primary care, Dr. Buchholz and his team are using data to drive decisions about operations to maintain those relationships. The Columbia Primary Care scheduling model, for example, guarantees same-day or next-day access with the patient's own provider, regardless of chief complaint. "Practices tend to focus on offering same-day sick visits, but bringing in patients for well visits or in-person or virtual visits for follow-ups enhances the relationship," Dr. Buchholz says. "The access is attractive for patients, and providers feel good about the continuity and quality of care they are providing."

New Manhattan locations on the Upper West Side, Chelsea, and the West Village are in the planning stages, along with a new site for adult and pediatric primary care in Tarrytown due to open in late summer.

"Patients not only want convenient access to primary care services, they also want—and should expect—excellent quality of care and a great patient experience," Dr. Buchholz says. "My goal is to build high-functioning primary care practices that deliver on those expectations."

More information: www.columbiadoctors.org/columbia-primary-care or 844-387-CARE (2273).

Improving the Treatment of Ocular Trauma By Jeff Ballinger

A new initiative led by a Columbia ophthalmologist promises to improve how medical professionals worldwide treat a serious, but undertreated, eye condition. The American Academy of Ophthalmology selected James Auran, MD, professor of ophthalmology at VP&S and chief of ophthalmology at Harlem Hospital, to lead the initiative to develop comprehensive national guidelines, proficiency standards, and continuing education for the management of ocular trauma, which is second only to cataracts as the most common cause of visual impairment.

As part of the initiative, Dr. Auran is spearheading a new evidence-based, structured ocular trauma curriculum for Columbia ophthalmology residents that will serve as a national model in academic medicine. Today, most ophthalmology residents only learn about ocular trauma on a case-by-case basis.

Plenty of protocols and standards exist for trauma management, says Dr. Auran, but few pertain to the eye. "Ocular trauma has been a smoldering, neglected stepchild," he says. "It is amazing that standards weren't developed earlier; eye trauma has been there all the time."

The idea for the initiative began at Harlem Hospital when Dr. Auran was appointed chief of ophthalmology and looked for ocular trauma protocols to adopt in the hospital. In his search he found that only the military had developed any standards of care for ocular trauma, which is a common battlefield injury. "There are no national standards for civilians," says Dr. Auran, "and that's what we are really trying to change."

The committee leading the initiative is working not only to adapt the military standards to civilian scenarios, but also developing protocols for disaster preparedness and response for use by hospitals and emergency medical teams.

One important job for the group, which includes members from the military, is to ensure first responders get the same training as medics in the military. "The first responder is vital and really determines what happens in the future," says Dr. Auran. "If the first responders are trained properly to provide immediate treatment, it can mean saving an eye."

For ophthalmologists, the standards of care and the continuing education under development will give existing specialists the additional knowledge and experience they need to be able to care for such patients. Eventually, says Dr. Auran, the committee hopes to create a subspecialty in ocular trauma, which he believes will improve care even further. The work has resulted in the founding of a new medical society, the American Society of Ophthalmic Trauma (theasot.org), and Dr. Auran is the society's first president.

Fertility Center Develops Multidisciplinary Approach By Jeff Ballinger

The Columbia University Fertility Center has created a unique bench-to-bedside approach that has improved patient care and sped up research developments.

The key is putting researchers together in the same location as the clinicians who treat patients, says the center's director, Zev Williams, MD, PhD, the Wendy D. Havens Associate Professor of Women's Health and chief of reproductive endocrinology and infertility.

At the center's Columbus Circle location in New York City, a research lab is contiguous with the clinical space. The seamless approach allows a free flow of information between doctors treating patients and doctors in the lab developing solutions. A significant leadership gift from John and Wendy Havens has helped launch the program.

"When discussing translational medicine, we often speak of trying to bring the laboratory bench closer to the patient's bedside. Here the lab is *at* the bedside," says Dr. Williams.

Patient satisfaction ratings have more than doubled since the center opened.

The comprehensive approach also benefits the center's researchers who are developing new techniques to improve the patient experience and outcomes. Dr. Williams and his team have developed a small, handheld DNA sequencer that can test fetal tissue for genetic abnormalities. Once in use, the technology will provide same-day results that can reveal the cause of some miscarriages. Patients who have miscarried typically wait days or weeks for lab results that can cost thousands of dollars.

Knowing what causes a miscarriage can help prevent future ones, and being able to quickly share results can ease patients' peace of mind. Dr. Williams is preparing to submit data that validate the test to New York state, and the test could be in use by the end of 2021.

From that breakthrough sprung another one with implications beyond the center's focus on fertility. Last year, the center's researchers realized the same approaches they had developed for DNA sequencing could be modified and applied to identify the COVID virus in nasopharyngeal and saliva samples and issue results in less than an hour. The COVID test is under review by New York state and the Food and Drug Administration, and the University has licensed the technology to a commercial developer.

The Fertility Center can be reached at 646-756-8282 or online at www.columbiaobgyn.org/patient-care/our-centers/columbia-university-fertility-center.


WARNING
EXIT

Faculty and Alumni Research Leads to Some of the Pandemic's First Drugs

IN THE LAB:

THE HUNT FOR COVID-19 ANTIBODY TREATMENTS

By Christina Hernandez Sherwood

Photographs by Jörg Meyer

IN THE LAB:

THE HUNT FOR COVID-19 ANTIBODY TREATMENTS

In the early 1980s, as scientists were beginning to understand the genetics of human antibodies, a young graduate student in the Columbia biochemistry laboratory of Frederick Alt, PhD, floated a novel idea: Mice genetically modified with genes for human antibodies could be the source of streams of new biologic drugs. Antibodies are attractive as drugs because the natural proteins are long-lasting and, by targeting specific proteins that cause disease, reduce side effects. The idea was described in a 1985 paper the student co-authored with Dr. Alt and Keith Blackwell in the journal Trends in Genetics.

George Yancopoulos

Thirty-six years later, that graduate student, George Yancopoulos, made headlines when his company, the Westchester-based Regeneron Pharmaceuticals, provided a COVID-19 antibody cocktail during President Trump's coronavirus infection in October 2020. The Regeneron therapy is known as REGEN-COV and mimics the response of a healthy immune system by delivering highly potent antibodies that neutralize the COVID-19 virus. One of the two antibodies that form the treatment was created from the same technology Dr. Yancopoulos first proposed in that Columbia laboratory decades ago.

"We spent probably the first 20 years of the company building that dream that Fred and I proposed in 1985," says Dr. Yancopoulos, who received his PhD degree in 1986 and his MD in 1987. "It's the basic technology that has led to our ability to produce more antibody-like biologicals over the last 10 years or so than any other entity or institution."

Dr. Yancopoulos joined Regeneron as its founding scientist in 1989, a year after Dr. Leonard Schleifer started the company. In 1995, VP&S namesake P. Roy Vagelos'54 began his ongoing tenure as chair of the Regeneron board. For more than a decade, the company honed its technology, which manipulates large segments of mouse DNA to create genetically humanized mice. The Regeneron solution created mice with hybrid antibody genes—half mouse, half human—so the mice can mount a normal immune response to an antigen and produce antibodies appropriate for therapeutic use. Before the desired antibodies are mass produced, more genetic engineering replaces the few remaining mouse parts with human portions to create fully human monoclonal antibodies that can be safely used in humans. This technology, honed from what Dr. Yancopoulos dubbed "the most valuable mouse ever created," has earned Regeneron billions of dollars in licensing revenue and led to numerous FDA-approved medicines.

Regeneron's first drug, Arcalyst, which treats the rare hereditary inflammatory disorders known as cryopyrin-associated periodic

syndrome, was approved in 2008 by the FDA. Praluent, Regeneron's first antibody drug, was approved by the FDA in 2015 to treat patients with cardiovascular disease by targeting a molecule called PCSK9 to lower the amount of LDL cholesterol in the blood.

In 2011, Regeneron hired another Columbia graduate, Christos Kyratsous'09 PhD, whose team made two crucial adaptations that would set the stage for the company's COVID-19 response nearly a decade later. The first was to streamline—and speed up—the company's drug development process. The second was to enable Regeneron to address infectious diseases which, unlike disorders previously targeted by the company's therapies, produce an antibody response in the human body. The team modified Regeneron's existing technology to feed those antibodies, both from the company's genetically modified *VelocImmune* mice and from the blood of people recovering from infectious diseases, directly into the Regeneron manufacturing pipeline.

Despite these advances, the company's first infectious disease program was unsuccessful. A promising treatment for respiratory syncytial virus, or RSV, failed in the final stage of clinical development when the single antibody it contained proved ineffective against a virus variant. Dr. Kyratsous would never forget the lesson: Two—or more—antibodies are better than one.

When Regeneron took aim at the deadly Ebola virus, the resulting treatment was a cocktail containing three different antibodies. Because Ebola survivors were so rare and time was of the essence in outbreak conditions, the three antibodies were generated in and harvested from the company's genetically modified mice. In October 2020, Inmazeb became the first FDA-approved treatment for Ebola—and Regeneron's eighth FDA-approved drug.

COVID-19 provided another opportunity for Regeneron to use its "rapid response" antibody discovery and development process. Dr. Kyratsous, now the company's vice president of research in infectious diseases and viral vector technologies, and his team turned to their technology in early 2020 to seek treatment solutions for coronavirus patients expected to fill U.S. hospitals.

David Ho

Meanwhile, just a half-hour's drive south from Regeneron, another of the world's leading antibody scientists, David Ho, MD, turned to work on the coronavirus just as he moved his Aaron Diamond AIDS Research Center to Columbia from Rockefeller University. Dr. Ho reached worldwide prominence in the 1990s for his role in developing an HIV drug cocktail that made the virus a survivable condition.

In 2003, he had halted his ongoing HIV work to help scientists in China combat the SARS coronavirus. He decided to again pause his laboratory's HIV research—most recently focused on developing drugs that could be administered less frequently than the daily cocktail and engineering antibodies to cure the disease—to target this new and dangerous coronavirus. "By the second week of January, we recognized that this was a SARS-like coro-

"Given our background in HIV, we recognized that there was plenty we could bring to bear and make a contribution."

navirus," says Dr. Ho, the Clyde'56 and Helen Wu Professor of Medicine at VP&S. "Given our background in HIV, we recognized that there was plenty we could bring to bear and make a contribution."

Through the spring of 2020, Dr. Ho and his team used blood samples from five of the sickest COVID-19 patients treated at Columbia to isolate antibodies that could block the virus from attacking healthy cells and prevent the disease from progressing. By the year's end, Dr. Ho's laboratory had not only found some of the most potent antibodies against COVID-19, but also re-engineered some of those antibodies to be bi-specific, meaning they could bind two different parts of the virus instead of just one. These bi-specific antibodies could, he says, be used to develop even more powerful drugs that cost less and are easier to administer than their counterparts. (Columbia Technology Ventures handles the licensing that transforms discoveries into potential clinical products.)

Back at Regeneron, the company again took a combination approach to its COVID-19 antibody development. The resulting cocktail of REGEN-COV consists of two antibodies: casirivimab from a genetically modified mouse and imdevimab from a human who recovered from the virus. The antibodies bind simultaneously to different parts of the virus' spike protein, so the virus would need to mutate in two distinct locations to evade both antibodies. "We could have gone much more rapidly with individual antibodies," Dr. Yancopoulos says. "But we felt it was critical to utilize a cocktail of antibodies to protect against mutant viral escape."

Just days after Regeneron released preliminary data on its COVID-19 cocktail, showing that it reduced viral levels of people in early stages of infection, President Trump's medical team contacted the company to request compassionate use of the cocktail. "The president was very early in his disease course, had seemingly not yet mounted his own antibody response, and had high viral titers," says Dr. Yancopoulos. "Those are the patients who potentially have the most to gain from our treatment."

After the president received Regeneron's cocktail, as well as other drugs including the steroid dexamethasone and the antiviral remdesivir, Trump's doctors reported his viral levels dropped. "The president's response was highly consistent with exactly how similar patients responded in the clinical trial," Dr. Yancopoulos says. "It's not too much of a stretch to think that he was the perfect patient."

About seven weeks after President Trump received Regeneron's COVID-19 antibody cocktail, the FDA granted the drug emergency

COURTESY OF REGENERON

RESEARCH UPDATES

Just as the COVID-19 pandemic has changed, antibody treatments are an ever-changing research focus. Some developments from the past few months:

- In January, after news broke of United Kingdom and South Africa variants, separate studies by Dr. Ho's lab and Regeneron scientists found that Regeneron's antibody cocktail remained effective against these variants, although the potency of one of the two antibodies in the cocktail was reduced against the South African variant. Similar in vitro studies have confirmed REGEN-COV's retained potency against variants first identified in Brazil, New York, and California.

- In March, Regeneron announced the results of the largest trial to date assessing COVID-19 treatments for high-risk, non-hospitalized patients. The company's antibody cocktail, REGEN-COV, was found to reduce the risk of hospitalization or death by about 70%.

- Phase 3 clinical trial data announced in April showed that a single dose, administered via subcutaneous injections, of REGEN-COV taken within four days of a household member's COVID-19 diagnosis could prevent the spread of the disease among family members. (Columbia participated in the study.) Regeneron will share the data with the FDA and request expansion of its emergency use authorization to use a 1,200 mg subcutaneous dose for COVID-19 prevention in appropriate populations.

- The rapid, at-home COVID-19 test that Dr. Ho's laboratory is developing, known as CoV-SCAN, won funding from the New York City Economic Development Corporation. Using the same technology as a home pregnancy test, CoV-SCAN uses a nasal swab sample to determine within 15 minutes whether a person carries high levels of the virus and is capable of infecting others.

"The president's response was highly consistent with exactly how similar patients responded in the clinical trial. It's not too much of a stretch to think that he was the perfect patient."

use authorization for early stage, non-hospitalized COVID-19 patients.

By the middle of December, two COVID-19 vaccines received FDA emergency use authorization, and the country's vaccine rollout began.

Both Dr. Yancopoulos and Dr. Ho plan to continue their antibody research, and Columbia and Regeneron are discussing a potential collaboration on COVID-19 antibodies. Despite the vaccines, people will still get sick with COVID-19 and need antibody treatments, says Dr. Ho. And others, for instance those with suppressed immune systems, might not respond effectively to the vaccine. "Our work is just as urgent now as it was last spring," Dr. Ho says, noting that some senior members of his team continue to live in Columbia medical student housing to enable round-the-clock work. "It certainly hasn't slowed down, just like the pandemic." While Dr. Ho continues his COVID-19 work, which includes developing a simple, rapid, and inexpensive COVID-19 test, he has begun to think about restarting the HIV projects his team left behind.

As Regeneron works toward full FDA approval of its COVID-19 antibody cocktail, the company is also studying the drug's effectiveness in later-stage patients, as well as its potential to prevent infection.

The full story of COVID-19 has yet to be written as vaccines and variants make headlines even into 2021, but Dr. Yancopoulos says he hopes science's successes against the virus will mobilize the country—and the world—to re-engage in science to solve current threats to human health, including Alzheimer's disease, diabetes, and obesity. "If we don't address these, it's going to dwarf the societal and economic impacts, and the human devastation, that we saw from this pandemic," he says. "This was almost, I hate to say it, a trial run for the bigger challenges facing mankind." ❖

ONEOFUS

Lorna Breen's Death Shines Light on Physician Suicide

By Sharon Tregaskis

LORNA BREEN, MD, was just six months shy of her 50th birthday when she died on April 26, 2020, but the family and coworkers left to mourn her death are doing what they can to make sure her legacy reaches beyond how she spent those 50 years of life.

Dr. Breen, VP&S assistant professor of emergency medicine, served as site director at the NewYork-Presbyterian Allen Hospital emergency department, learned medical Spanish to better serve her northern Manhattan patients, chaired the American College of Emergency Physicians' work group that created a point-of-care tool for supporting patients with autism, and traveled to India to teach CPR. From her Converse sneakers to her brown pixie cut, she exuded confidence; her broad smile was legendary. Dr. Breen embraced opportunities to mentor and support junior colleagues and trainees; her scholarly research sought practical interventions to promote well-being and protect her team against the burnout endemic among emergency physicians. And at the time of her death, Dr. Breen was enrolled in an MBA-MS program in pursuit of her dream to work as a chief medical officer.

"Lorna brought a passion, a dedication, an interest in things," says Angela Mills, MD, chair of emergency medicine at VP&S since 2018. "When Lorna was working on a project she put in 110 percent. She would make sure to research everything, talk to everyone, really look into it deeply to uncover any potential issue or challenge," says Dr. Mills, who is the J.E. Beaumont Professor of Emergency Medicine. "She was very thorough and brought this zeal, this energy. You knew it was going to be done well."

Dr. Breen brought equal zeal to her personal life. She ran marathons, joined Toastmasters, took turns hosting a book club, and participated in a close-knit Bible study group whose running email thread of prayer requests sustained their connection even when they couldn't meet in person. When she finally bought her dream car in her 40s, her choice—a black Porsche 911 convertible—earned her some good-natured ribbing about a midlife crisis. Dr. Breen took salsa classes, dragged friends out to dinner, took cello lessons, and joined the beginners' chamber group for the New York Late Starters String Orchestra; over time she advanced to play in the orchestra itself. And once a year, Dr. Breen hosted a party on the rooftop of her West Village apartment building in Manhattan, assembling loved ones from every facet of her life.

In early March 2020, Dr. Breen joined her younger sister, Jennifer Feist, for a family snowboard trip in Montana. She zipped down the slopes—clad in a bright orange puffy jacket—with her niece and nephew, then lounged in the hot tub with her sister, brainstorming party plans for Dr. Breen's upcoming 50th birthday. As the world news focused on COVID-19, Dr. Breen monitored work emails about NewYork-Presbyterian's preparations for the expected cases. By March 14, when she returned to work, the case count at NewYork-Presbyterian had exploded. Personal protective equipment, oxygen tanks, even health care workers themselves were in short supply as illness and quarantine thinned their ranks. Within four days, Dr. Breen herself was infected.

A Return to Work but not the Same

When Dr. Breen returned to work in April, she was changed. Once unflappable, she had trouble keeping up with the flood of patients and changing protocols. Once adamant about getting a full eight hours of sleep every night—she had penned a literature review early in her career about the physical and mental hazards of exhaustion among emergency doctors—she finished 12-hour shifts then kept working. No one was going home, she told Ms. Feist; the need was just too great. "She said it was like Armageddon," Ms. Feist recalls.

Perhaps no one grasped the toll of those days more clearly than Ms. Feist. Born just 22 months apart, the sisters grew up sharing a bedroom and wearing coordinated outfits; they had their own secret language. In adulthood they texted constantly, spoke daily on the phone, and traveled together domestically and internationally. The two were "attached at the hip," says Ms. Feist's husband, Corey.

On April 9, Dr. Breen called Ms. Feist from her West Village apartment. She hadn't slept in a week; she'd given up, she said, and needed her sister to take over. Ms. Feist, living in Virginia, offered to buy Dr. Breen a plane ticket. She couldn't get to the

ALYSSA CARVARA

airport, Dr. Breen replied; she couldn't even get out of her chair. While Mr. Feist contacted Dr. Mills to stay with Dr. Breen, Ms. Feist contacted friends to drive Dr. Breen south. Ms. Feist met her sister in Baltimore and the two drove directly to the University of Virginia Medical Center, where Dr. Breen spent the next 11 days in the psychiatric inpatient unit. Five days later, Dr. Breen was dead.

After her release from the inpatient unit, Dr. Breen had anguished over her professional fate. "This is a career ender," she told her sister on multiple occasions. "I'm going to lose my license and I'm going to lose my job." When Dr. Mills sent an email to emergency department staff a few hours after Dr. Breen's death, she honored the family's request for privacy concerning the cause of death.

The next day, however, a New York Times headline read "Top E.R. Doctor Who Treated Virus Patients Dies by Suicide." On Twitter the news spread like wildfire.

The Feists knew that shame, stigma, and a culture of stoicism compel many doctors to power through exhaustion and psychic pain. And they had every reason to suspect that many more doctors on the front lines were suffering as Dr. Breen had.

Out of Pain, a Promise

And so the Feists determined to seize the opportunity they had been given to shine a spotlight on the need for mental health support for health care workers and spare others the agony Dr. Breen had endured. "It's much bigger than Lorna, than one person," says Mr. Feist, who now speaks regularly on behalf of the Dr. Lorna Breen Heroes' Foundation, the nonprofit he and Ms. Feist founded. "The story has evolved from that of a tragic suicide to an issue that affects health care workers in this country and all around the world."

The rate of deaths in the United States attributed to suicide has increased every year from 2000 to 2018, and health care workers are at particularly high risk. Among medical students, trainees, and early-career physicians, suicide is the leading cause of death. Among doctors over age 34, suicide is the second most common cause of death. Health care workers, broadly, are twice as likely to die by suicide as the general population, in part because they have the expertise to make their attempts more devastating. And while many suicide deaths go unreported, current data suggest that physicians die of suicide at a rate of one every day. Women and those practicing emergency medicine are at highest risk.

In recognition of the extreme mental health risk her staff faced as the pandemic surged in late March, Dr. Mills partnered with the Department of Psychiatry to institute virtual peer debriefing sessions for staff throughout the emergency department. "There was a sizable group who were attending," says Dr. Mills. Facilitated by psychiatrists and psychologists, the groups provided a structured environment for staff to discuss their experiences and express their concerns among people who understood what they were going through. "A lot of what we see and do is hard to talk about with people who aren't in the medical field," says Dr. Mills. "With COVID, that's been much more significant and challenging."

In early April, the VP&S Department of Psychiatry launched Cope-Columbia in partnership with ColumbiaDoctors and NewYork-Presbyterian to offer free, confidential access across the medical center to counseling sessions, peer support groups, guided meditation, suggested reading, and other resources for managing stress, fear, and anxiety.

"Our expectation that our health care providers be superhuman with no needs, no fears, and no need for rest has to change. The burnout rate, the anxiety, the depression, the increased rate of suicide, why does this have to be part of the job?"

After Dr. Breen's death, Dr. Mills scheduled one-on-one sessions for everyone to see a therapist. "People could opt out," she explains, "but I felt it was really important to make it as easy as possible for people to get support." Among the 70% of the staff who participated in those initial sessions, more than 20% continued with further sessions. "There was a need," says Dr. Mills, who recognizes the pervasive stigma among health care workers of seeking help. "We need to do a better job normalizing mental health care among providers. If someone had surgery on their knee, we would ask 'How are you doing?' As leaders, the best thing we can do is talk about mental health, remove the stigma."

The Science of Suicide

J. John Mann, MD, the Paul Janssen Professor of Translational Neuroscience in Psychiatry and Radiology, echoes that sentiment: "Doctors are designed to give help. They're less good at getting help." Compared with members of the general public, physicians are less likely to have a personal physician or get regular physicals. "They ignore their own health or wing it, ask a colleague down the hall about a symptom they may have noticed." That's why efforts like Dr. Mills' opt-out counseling sessions can be lifesaving, Dr. Mann says; doctors are no less likely than the general population to have depression, but they are less likely to be screened or treated.

In October 2020, the American Journal of Psychiatry published Dr. Mann's model of suicidal behavior, a framework he began developing in the late '90s to identify opportunities for intervention among people at greatest risk of suicide. "Suicide is not just

The VP&S Department of Emergency Medicine created an annual lecture series to honor the memory of Dr. Breen. It will host leaders who will promote her passions of professional development, love of learning, and the importance of continued growth. The inaugural Dr. Lorna Breen Annual Lecture was held April 21, 2021. See more at **www.cuimc.columbia.edu/news/emergency-medicine-holds-first-dr-lorna-m-breen-annual-lecture.**

COREY FEIST

Lorna Breen, left, with her younger sister, Jennifer Feist. The sisters, who were just 22 months apart in age, had their own secret language.

a simple result of extreme stress," he notes. Nor is it an inevitable outcome of major depression or post-traumatic stress disorder, whose symptoms can ebb and flow over the course of a lifetime. Rather, he explains, death by suicide represents a synergy of nature, nurture, and opportunity. Stressors like job loss, divorce, or trauma can trigger suicide in those already weighed down by depression and having a predisposition—diathesis, in the model's parlance—to respond to despair and hopelessness by suicide. That predisposition is itself an outcome of an individual's unique genetic and epigenetic characteristics. "Once you understand the propensity and the role of the stress, it becomes clearer why people die by suicide and opens up opportunities to intervene.

"For front-line workers, COVID-19 is a constant and ongoing stress," says Dr. Mann. In the wake of the 9/11 terrorist attacks, multiple studies documented spikes in depression and PTSD among people who had been most closely affected. That event, however, was comparatively brief. "COVID has placed health care workers under chronic, relentless, unpredictable, severe stress. They have worked until they dropped. A number of them became exhausted physically and mentally and some of those doctors had a predisposition to depression and suicide that they knew nothing about."

Furthermore, says Dr. Mann, viral infection itself can wreak havoc on mental health. "Viral illnesses like influenza are known to trigger depression in certain individuals and increase the suicide rate," he says. Autopsies have shown that among people who die by suicide, heightened inflammation in the brain is more common. "The inflammatory response directed at a virus can spill over into the brain and affect brain function," says Dr. Mann, who points to evidence that COVID-19 triggers severe inflammation throughout the body, and infection can affect neurological symptoms even if viral particles never cross the blood-brain barrier. "COVID-19 is notorious for provoking an extreme immune response and has the potential to trigger suicidal behavior."

Destigmatizing Physician Suicide

On Physician Suicide Awareness Day on Sept. 17, 2020, Dr. Mann joined the Feists, other health care professionals, and national leaders for an online discussion about evidence-based tactics to reduce suicide risk at Columbia and throughout the health care industry. Dr. Mann champions ongoing outreach and education both about mental health risk factors, as well as support services, such as 24-hour text and phone counseling and access to free, same-day appointments. "For physicians, that is probably one of the most important things," he says. "Lower the barriers to attaining quality help." And given the stigma, confidential and even anonymous support services can be vital.

Devjani Das, MD, VP&S associate professor of emergency medicine, organized the Physician Suicide Awareness Day discussion. If the pandemic has a silver lining, Dr. Das says, it's the spotlight that has been shone on the hazards health care workers endure and ways to mitigate those risks. "It's no longer a conversation behind closed doors. People recognize it can happen to themselves, to people they love."

Bernard Chang, MD, PhD, associate professor of emergency medicine at VP&S, met Dr. Breen in 2012 on his first shift as an attending at the Allen Hospital. "She could tell I was super anxious for my first shift as a grown-up doctor," says Dr. Chang, now vice chair of research for the department. "She actually stayed while I saw my first patient, to make sure I was doing OK." Over time, the two became friends and in 2019 co-authored an analysis of burnout prevention in the American Journal of Emergency Medicine. "Lorna was a true intellectual, always asking the *why* questions. And she would always bring it back to something translatable and meaningful in the short term that could have an immediate impact for patients and providers."

To extend Dr. Breen's legacy of practical, evidence-based interventions to promote physician well-being, the Feists have championed the Dr. Lorna Breen Health Care Provider Protection Act, bipartisan federal legislation introduced in both the U.S. Senate and House of Representatives. The legislation would create behavioral health and well-being training programs as part of a national campaign to encourage health care workers to seek support. Through the Dr. Lorna Breen Heroes' Foundation, the Feists also have become proponents of changes to the questionnaires used by some state licensing boards and health systems that require physicians to disclose mental health diagnoses and treatments, in violation of the Americans with Disabilities Act.

DR. LORNA BREEN HEROES' FOUNDATION:
drlornabreen.org

"What we learned after my sister's death is that her fears for her job, for her license, and frankly even her concern for the respect of her colleagues were not off base," said Ms. Feist during the Physician Suicide Awareness Day event. "Our expectation that our health care providers be superhuman with no needs, no fears, and no need for rest has to change. The burnout rate, the anxiety, the depression, the increased rate of suicide, why does this have to be part of the job? My sister needs to be the last one who dies like this." ❖

My Path from Columbia to a Nobel Prize

How a War Launched My Career in Research

By Robert J. Lefkowitz'66 with Randy Hall

Robert Lefkowitz'66 receiving his Nobel Prize from Sweden's King Carl XVI Gustaf at the Stockholm Concert Hall in December 2012

I had yearned to attend medical school since the age of 8 but had not the slightest bit of interest in research during my medical school days. I was determined to become a practicing physician, and research seemed like a distraction from my single-minded goal.

I did have one brief exposure to research during medical school at Columbia, and it did not leave a positive impression. After finishing the formal coursework in the first two years of the curriculum, I won a prize for having the best grades in my class. This prize, which was sponsored by the drug company Roche, consisted of a swanky new wristwatch and an all-expenses-paid trip to an exotic location: New Jersey. Specifically, I won a day at Roche's U.S. headquarters in Nutley to see how drugs were developed. During this visit, I observed a team of Roche scientists who were searching for new cough medications. Their job was to screen every drug made in any program at Roche for the ability to suppress coughing, because cough suppressants were big moneymakers.

This research group's main experimental technique was to use a Rube Goldberg-type contraption to tickle cats' throats to induce coughing, then inject the cats with dozens of different drugs, one by one, to search for drugs that might reduce the feline hacking. I tried to hide my disgust from the researchers who were hosting me, but I was absolutely mortified by these studies. I felt sorry for both the cats and the poor bastards who had to spend all day tickling their throats. After this experience, I became even firmer in my conviction that I would never go into research.

As medical school wound down in the spring of 1966, my family's future was endangered by a looming threat: the Vietnam War. At that time, all graduates of American medical schools were required to enter the military to serve a year in Vietnam. There was no lottery system—the military had an acute shortage of doctors, so *every* medical school graduate was mandated by law to serve. I believed in the importance of serving one's country but also dearly wanted to avoid being separated from my young family and sent halfway around the world for a year to support a war that I and most of my classmates believed was wrong. I felt a growing sense of trepidation and searched for some kind of alternative path that might allow me to serve honorably and also stay close to my family.

There were several ways to avoid the "doctor draft" during the Vietnam War. Medical school graduates were allowed to request a one- or two-year deferment to complete their internships and up to one year of residency training. After that, though, service in Vietnam was required unless some other arrangement was made. One attractive possibility was to gain a commission in the United States Public Health Service (USPHS), which was considered part

of the U.S. military and thus fulfilled one's draft obligation. USPHS physicians could work as prison doctors in the federal penitentiary system, help to track global pandemics at the Centers for Disease Control, or conduct research at the National Institutes of Health (NIH). Despite my previous lack of interest in research, I decided to pursue this last option.

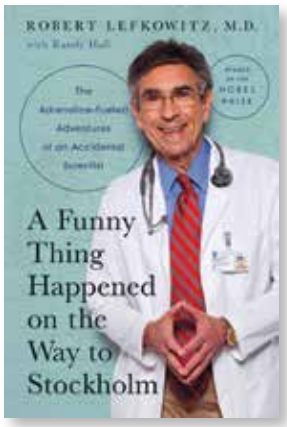
I hoped to become an academic physician, maybe even a chair of medicine at a top medical school someday, and was becoming aware that such positions required at least some research experience. Most of the prominent doctors who trained me at Columbia were alleged to have done research at some point in their pasts, and a handful were even supposedly still active. For example, one of my attending physicians, William Manger, was a subject of fascination amongst the medical students. Whenever he walked past, you'd hear people say in hushed tones, "I hear he does research." It clearly gave him a special cachet and cool factor.

Manger was also notable because he was the heir to a hotel fortune. He dressed sharply in three-piece suits, complete with a pocket watch dangling on a gold chain. Late in my last year of medical school, he invited several of us who were on rounds with him over to one of the Manger hotels downtown. After we enjoyed lunch in the luxurious dining room, Manger casually asked, "Would you like to see my laboratory?" We were curious, of course, and even more curious when he got into the elevator and pressed the button for the penthouse. When the elevator doors slid open, we strode into a spectacular suite that had been converted into a research lab. Hundreds of glass beakers were glinting in the abundant light, and the windows on all sides looked out over jaw-dropping views of New York City. I was in awe and began to think that maybe research wasn't so bad after all.

Having decided that a bit of research might be a nice addition to my resume, I submitted my application to the NIH. I was accepted for an interview and drove to Bethesda, Maryland, for my interviews on July 1, 1966. Unfortunately, the first of July also happened to be the start date for my internship at Columbia-Presbyterian Medical Center. As if beginning my internship wasn't stressful enough, I had to miss my first day (and beg someone to cover for me) in order to conduct my interviews in Bethesda.

Robert Lefkowitz posing with his parents at his medical school graduation. "I smiled for a photo but was feeling stressed about the 'doctor draft' that might send me to Vietnam." His father said it was the proudest day of his life.

The interview process was a match-based system: Applicants had to rank the group leaders with whom they wanted to work, and the group leaders in turn had to rank all the applicants. It was a highly competitive process, with hundreds of the best and brightest young doctors across the country applying for a limited number of slots.



My interviews at the NIH went poorly. For one thing, I had no research experience at all, which I began to realize was a major negative when interviewing for a research position. I had to explain over and over again to different NIH scientists why I hadn't bothered to take advantage of the various research opportunities that had existed at Columbia. My lack of research experience was compounded by my lack of enthusiasm, as I wasn't actually very excited about research but rather just trying to bluff my way through the process by pretending to be enthused.

The toughest interview of the day was my last, with a tall, hyperkinetic scientist named Jesse Roth. He asked why I wanted to come to the NIH. I said the words I thought he wanted to hear.

"My goal is to become a triple threat: I want to be a great physician, great researcher, and great administrator."

"That's bullshit," Roth replied. "You'll never be great at all three. You have to choose. Which would you choose if you could only be great at one?"

I was taken aback by his tone and stammered my way through an incoherent answer. When I left Roth's office and staggered back to my car, I was certain that I'd screwed up and wouldn't receive an offer for one of these coveted positions. I felt an impending sense of doom that I would soon be torn away from my family and sent on a tour of duty in the jungles of Vietnam.

During the first few months of my internship at Columbia, as I honed my clinical skills as a physician overseeing a whole roster of patients each day, I kept waiting to learn whether my next move would be to the NIH or Vietnam. Finally, a phone call came for me at the hospital and someone yelled down the hall that it was from the NIH. I raced to the phone and picked up the receiver. The call was from Jesse Roth himself, and he wanted to know if I would be interested in joining his research group. I accepted on the spot and raised my arms in triumph when I hung up the phone.

This is excerpted from "A Funny Thing Happened on the Way to Stockholm: The Adrenaline-Fueled Adventures of an Accidental Scientist" by Robert Lefkowitz with Randy Hall. Dr. Lefkowitz, one of two Nobelists in the Class of 1966, shared the 2012 Nobel Prize in Chemistry. His memoir was published in February by Pegasus Books.

Alumni News & notes

By Marianne Wolff'52, Alumni Editor, and Bonita Eaton Enochs, Editor

1953

J. Courtland Robinson, associate professor emeritus at Johns Hopkins School of Medicine, writes that he enjoys retirement with his wife and spends time in his retirement community's wood shop "where I spend a number of hours wood turning and repairing furniture most every day." He spent 11 years on the faculty of Yonsei University College of Medicine in Korea before joining Johns Hopkins. He retired in 2001. He fondly remembers faculty members Virginia Apgar, Howard Taylor, and "other exciting teachers."

1961

Thomas Mack has authored a second edition of his book about cancers in urban environments. Read more in Alumni in Print. Tom is professor of preventive medicine at the Keck School of Medicine of the University of Southern California. He has chaired California's Carcinogen Identification Committee for the state's Office of Environmental Health Hazard Assessment for more than 25 years.

1966

Robert Lefkowitz has published a memoir, "A Funny Thing Happened on the Way to Stockholm," which is excerpted on Page 26 of this issue. Bob shared the 2012 Nobel Prize in Chemistry.

1969

See Alumni in Print to read about a book written by Jeffrey Fisher, who has retired in Phoenix, Arizona. After an internship at Harlem Hospital and a medicine residency at the University of New Mexico, he began a 45-year career in internal medicine. He worked for the State Department and the Indian Health Service and was in a private group practice. In retirement he mentors first- and second-year students at the University of Arizona.

1971

Read about a book by Arnold Eggers in Alumni in Print. Arnold is an academic neurologist who made a midcareer shift into theoretical medicine. He has published 18 articles in the journal Medical Hypotheses describing the effects of stress. He retired from joint appointments at SUNY-Downstate Medical Center and Kings County Hospital. He is now associate professor emeritus of neurology at SUNY-Downstate.

1973

Daniel Von Hoff received the American Association for Cancer Research's inaugural Daniel D. Von Hoff Award for

Daniel Von Hoff '73

Outstanding Contributions to Education and Training in Cancer Research. Dan received the award named for him at the 2021 meeting of the association. He was recognized for his groundbreaking accomplishments as an educator, for his sustained scientific innovation that has accelerated advances in cancer science and medicine, and for his contributions to the education and training of thousands of clinical cancer investigators. Dan is Distinguished Professor at the Translational Genomics Research Institute (TGen) in Phoenix, Arizona. He also is Distinguished Professor in the Department of Medical Oncology and Therapeutics Research at City of Hope in Duarte, California; Virginia G. Piper Distinguished Chair for Innovative Cancer Research at HonorHealth Clinical Research Institute; Margaret Givan Larkin Endowed Chair in Developmental Cancer Therapeutics at Hoag Family Cancer Institute; chief scientific officer for US Oncology Research; and professor of medicine at the University of Arizona and the Mayo Clinic in Scottsdale, Arizona. He has been a member of the AACR since 1977 and was inducted into the inaugural class of Fellows of the AACR Academy in 2013. He served as AACR president from 1999-2000.

1979

See Alumni in Print to read about a book written by Mindy Thompson Fullilove. Mindy is professor of urban policy and health at the New School's Milano School of Policy, Management, and Environment. Her work as a social psychiatrist focuses on the ways environmental factors affect the mental health of communities. Her latest book is her sixth, and she has published numerous articles in her field.

Mindy Thompson Fullilove'79

1983

Aaron E. Glatt received the 2020 Laureate Award from the New York chapter of the American College of Physicians. The Laureate Award honors Fellows and masters of the college who have demonstrated an abiding commitment to excellence in medical care, education, or research through service to their community, their chapter, and the American College of Physicians. Aaron is chair of medicine and chief of infectious diseases at Mount Sinai South Nassau in Oceanside and professor of nedicine at the Icahn School of Medicine at Mount Sinai. He also is the associate rabbi at the Young Israel of Woodmere. He has been designated a Master of the American College of Physicians by the American College of Physicians Awards Committee.

Aaron E. Glatt'83

1986 PhD/1987 MD

George Yancopoulos and the company he leads, Regeneron, made headlines last fall with its new drug to treat COVID-19. Read about his work—and the antibody research done by Columbia's David Ho, MD—on Page 16 of this issue.

1990

Intermountain Healthcare based in Salt Lake City, Utah, named Shannon Connor Phillips chief medical officer for community-based care and president of the Intermountain Medical Group that includes more than 2,500 employed physicians and advanced practice providers. She joined Intermountain Healthcare from the Cleveland Clinic in 2017 as chief patient experience

Shannon Connor Phillips'90

officer. She has practiced as a pediatric hospitalist for 25 years (currently at Intermountain Primary Children's Hospital in Salt Lake City) and serves on the Board of Directors of the National Quality Forum.

1994

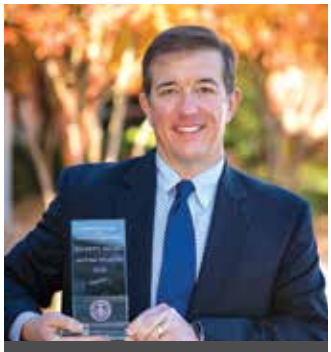
Sanjeev Bhalla has been named the American Roentgen Ray Society's 2021 Distinguished Educator. He was formally recognized during the opening ceremony of the society's virtual annual meeting in April. Sanjeev also has joined the Radiological Society of North America Board of Directors as liaison for education. Since 2007, Sanjeev has been section chief of the cardiothoracic imaging section at

Sanjeev Bhalla'94

Mallinckrodt Institute of Radiology in St. Louis, where he also is professor of radiology, assistant residency program director, and vice chair for education. He also is co-director of body CT and clinical radiologist at Barnes-Jewish Hospital, Barnes-Jewish West County Hospital, and St. Louis Children's Hospital.

1995

Mark D. Olszyk, chief medical officer and vice president of medical affairs at Carroll Hospital in Westminster, Maryland, received the American College of Healthcare Executives Senior-Level Healthcare Executive Regent's Award at a November 2020 event. Mark has served in leadership positions at Carroll Hospital since 2013 and is board-certified in health care management as a Fellow of the American College of Healthcare Executives. He has served on the Maryland Board of Physicians since 2014 and is currently vice chair. He is also a Fellow of the American College of Emergency Physicians and is a certified physician executive through the American Association of Physician Leaders.



Mark D. Olszyk'95

1996

Hillary Kunins has joined the San Francisco Department of Public Health as director of behavioral health services and mental health SF to lead the city's mental health initiative. Hillary had been executive deputy commissioner of the New York City Department of Health

Hillary Kunins'96

and Mental Hygiene, where she oversaw the department's major strategic initiatives to improve the mental and behavioral health of New Yorkers. She also has an MPH degree from Columbia's Mailman School of Public Health.

2005

Hooman Kamel received a 2020 Joseph A. Vita Award from the American Heart Association at the group's virtual scientific session meeting in November. The annual award honors the late cardiovascular scientist Joseph A. Vita, MD, to recognize research that has had a major impact on the field of cardiovascular biology or cardiovascular health during the

COURTESY OF AMERICAN HEART ASSOCIATION

Hooman Kamel'05

past five years. Hooman was recognized for research on atrial dysfunction and atrial fibrillation that has shed insight into the causes of unexplained stroke. He is vice chair for research in the Department of Neurology at Weill Cornell Medicine and director of the college's clinical and translational neuroscience unit in the Feil Family Brain and Mind Research Institute. After medical school, Hooman trained at the University of California, San Francisco as a neurology resident and neurocritical care fellow. He joined Weill Cornell in 2011.

2009

Lori Leslie has been named co-medical director of the Hackensack Meridian Mountainside Medical Center's cancer program, which is affiliated with the John Theurer Cancer Center at Hackensack University Medical Center. After a residency at Columbia, Lori completed a fellowship at the University of Texas, MD Anderson Cancer Center, where she served as chief fellow. She is board certified in hematology, medical oncology, and internal medicine and specializes in non-Hodgkin

Lori Leslie'09

lymphoma, Hodgkin lymphoma, and chronic lymphocytic leukemia. She also is director of the indolent lymphoma and chronic lymphocytic leukemia research programs at John Theurer Cancer Center.

2011

Uzodinma Iweala has been appointed to the Board of Trustees of the Sundance Institute. He and other trustees on the 32-person board will work with the board chair and the institute's executive director to help shape the business, cultural, and philanthropic goals of the organization, a nonprofit committed to the growth of independent artists through programs that discover and support independent filmmakers, theater artists, and composers all over the world. Uzodinma is a writer, filmmaker, and CEO of The Africa Center, which is dedicated to promoting a new narrative about Africa and its diaspora. His books include "Beasts of No Nation," a 2005 novel that was adapted into a major motion picture.

2017

Sarah Sherwood received a resident teaching award at the January 2021 transition ceremony that marked the Class of 2023's transition to patient-centered training. Each year at the Steven Z. Miller Student Clinician's Ceremony (named for a 1984 graduate), the class that just completed its major clinical year nominates residents for Arnold P. Gold Foundation Humanism and Excellence in Teaching Awards. The residents were nominated for their qualities as teachers and role models for members of the Class of 2022. Sarah is chief resident in internal medicine and also an instructor in medicine at VP&S.

Sarah Sherwood'17

Stan Wang'17

Stan Wang received a 2020 Henri Termeer Fellowship, which is awarded to up-and-coming company founders, CEOs, or heads of life science organizations working to bring life-changing treatments to patients. Stan, who also has a PhD from the University of Cambridge, is founder and CEO of Thymmune Therapeutics, a cell therapy company. Before founding Thymmune Therapeutics, Stan was founding chief scientific officer at Cellino Biotech.

Two PhD Grads Receive New Innovator Awards from NIH

Annegret L. Falkner and Christine M. Constantinople were among 53 recipients of NIH Director's New Innovator Awards announced in October 2020. The New Innovator Award was established in 2007 to support unusually innovative research from early career investigators who are within 10 years of their final degree or clinical residency.

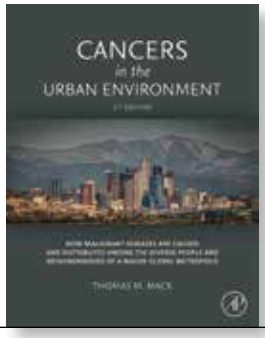
The awards are part of the NIH's High-Risk, High-Reward Research Program that funds innovative and impactful biomedical or behavioral research proposed by creative scientists. The program catalyzes scientific discovery by supporting research proposals that, due to their inherent risk, may struggle in the traditional peer-review process despite their potential. Program applicants are encouraged to think "outside the box" and to pursue trailblazing ideas in any area of research relevant to the NIH's mission to advance knowledge and enhance health.

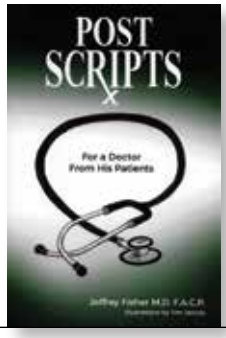
Dr. Falkner received her PhD in neuroscience in 2012. She is assistant professor at the Princeton Neuroscience Institute, where her lab focuses on understanding how social experiences, including social dominance and defeat, lead to the generation of persistent affective states. Her New Innovator Award project is titled "Generating Pro-Resilient States Through Individualized Circuit Read-Write Therapeutics." Her other honors include an NIH Pathway to Independence Award, a NARSAD Young Investigator's Award, and an Alfred P. Sloan Research Fellowship.

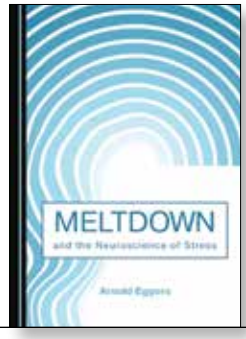
Annegret L. Falkner'12 PhD

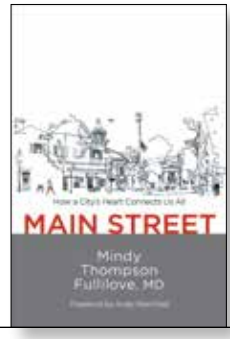
Christine M. Constantinople'13 PhD

Dr. Constantinople received her PhD in neuroscience in 2013. She is assistant professor in the Center for Neural Science at New York University, where she uses a variety of circuit-based approaches to understand how animals assign value to different actions and outcomes and use those value estimates to guide behavior. The title of her funded project is "Neural Circuit Mechanisms of Arithmetic for Economic Decision-Making." Her other awards include an NIH Pathway to Independence Award, an Alfred P. Sloan Research Fellowship, and the Klingenstein-Simons Fellowship Award in Neuroscience.









alumni *in print*

Cancers in the Urban Environment: How Malignant Diseases are Caused and Distributed among the Diverse People and Neighborhoods of a Major Global Metropolis (second edition)

Thomas M. Mack'61

Academic Press, 2020

Dr. Mack's book is the only comprehensive, evidence-based description of the pattern of diverse common malignancies. The book reviews the ethnically, socially, and environmentally complex milieu of the 10 million people and 2,346 neighborhoods of California's Los Angeles County. The rates of 104 malignancies are compared with those in London and other U.S. locations and categorized by gender, age, race/ethnicity, calendar time, social class, and (most notably) individual neighborhood. The 2004 first edition covered diagnoses occurring from 1972 to 1998, and the second edition derives from the experience of roughly 750,000 affected persons diagnosed from 1999 through 2016.

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Postscripts for a Doctor from His Patients

Jeffrey Fisher'69

Jones Media Publishing, 2020

Dr. Fisher looks back on his 45-year career in internal medicine by sharing some of the ways his patients taught him through their "courage, humor, faith, love, kindness, fortitude, and flexibility." He wrote the book of "stories about 17 patients who taught me lessons while I was treating them" not as a memoir but as a way to encourage medical students to consider careers in primary care. Sales of the book are used to purchase copies for medical students. "It is my hope that these stories will encourage medical students to explore the unique relationships that can develop between doctor and patient. They then will find an abundance of stories and experiences of their own," Dr. Fisher writes in the book's introduction.

Meltdown and the Neuroscience of Stress

Arnold Eggers'71

Cambridge Scholars Publishing, 2019

Dr. Eggers' book investigates how stress causes a cluster of life-threatening diseases. One reviewer said: "He has formulated a robust eminently testable model which provides a deep pathophysiological understanding of the aetiology both of a range of neuropsychiatric disorders ranging from Alzheimer's disease to schizophrenia and of other all-too-common disorders such as obesity and hypertension. The Eggers Model immediately suggests attractive therapeutic options for these disorders." In particular, the book predicts that surgical denervation of the autonomic nervous supply to the adrenal glands and kidney can prevent Alzheimer's disease and stroke. The book is accessible to the general reader; it has diagrams and summaries and walks the reader through basic concepts. It also includes some personal narrative and anecdotes about Columbia.

Main Street: How a City's Heart Connects Us All

Mindy Thompson Fullilove'79

New Village Press, 2020

Dr. Fullilove's 11-year voyage to 178 cities in 14 countries resulted in this book that asks the question: How do main streets contribute to our mental health? The visits enabled Dr. Fullilove to discern the larger architecture of main streets—the ways that main streets are shaped for a vast array of social gatherings and processes and how they are markers for the integrity of civilization. Dr. Fullilove's book describes how a pattern of disinvestment in inner-city neighborhoods has left main streets across the United States in disrepair, weakened cities, and left residents vulnerable to catastrophe. Issues of racial injustice, climate change, and COVID-19 have highlighted the importance of main streets for empowering our communities.

Holocaust Remembered

By John H. Merey'65

ABOVE RIGHT: Yellow star worn by Dr. Merey's mother, Mrs. Ernestine Merey, in Budapest, April 1944

THE MEREY FAMILY: DeAnne Merey, Andrew Merey (now deceased), Daisy Merey, and John Merey

By now, I may be the last Holocaust survivor among VP&S graduates still practicing. Like every other Holocaust survivor I, too, have a story.

I was born in Budapest, Hungary, June 14, 1940. My family was an upper middle class Jewish family whose roots had been in Hungary for generations. My grandfather had been a teacher in Budapest while my other grandfather had been the general distributor, for all of Hungary, for the Manner Confectionary Company of Vienna. My father graduated from the Technical University of Budapest as a civil engineer.

Hungary under its leader, Admiral Nicholas Horthy, had been allied to Germany since the late 1930s. While the rest of European Jewry had been decimated, we in Hungary were still alive. While there were anti-Semitic laws and Jewish men had to serve in labor battalions, daily life continued, more or less normally, especially compared to the rest of Europe.

PHOTOS COURTESY OF JOHN MEREY

All this dramatically changed overnight on March 19, 1944, when German troops occupied Hungary. The next day Eichmann arrived in Budapest and the Holocaust in Hungary would begin at a frantic pace. In six and a half weeks, 437,000 Jews were deported to Auschwitz; 90% would never return. The deportations were initiated by the Nazis but were carried out by the Hungarian gendarmerie.

We in Budapest knew that our turn would come next. The Zionist movement, a relatively unimportant group in Hungary, had some experience in negotiating with the Nazis. They felt that the deportations in Slovakia had been halted (though temporarily) on the basis of bribes. Eichmann made an unprecedented offer. The Germans would exchange 1 million Jews for 10,000 trucks to be used only on the Eastern front. This offer was, of course, rejected by the Allied powers. However, the offer did provide a small path of negotiation, into which stepped a Zionist, Dr. Rudolph Kasztner.

Through Dr. Kasztner's negotiations with Eichmann, a group of 1,684 Jews from Hungary would be allowed to go to a neutral country. Should we join this group?

My uncle, Dr. Nisan Kahan, a Zionist, explained to the family, "If we stay in Budapest, we will perish 100%; if we go on this train we will perish only 99%." On the basis of the 1% difference, 14 members of our family, including me and my parents, boarded the train in Budapest on June 30, 1944.

There were immediately some surprises. The train was not a passenger train but a freight train made up of cattle cars. There was a shower procedure in Linz, Austria, where some of the passengers were not sure if water or gas would come out. Finally, after 10 days we arrived in a small German town by the name of Bergen Belsen, a name that meant nothing to us!

We soon discovered we were in a "lager," a concentration camp. After six weeks, a group was allowed to leave for Switzerland. In this group was my entire family, except for me and my parents. At this point my mother, a normally shy person, went up to the commandant in Bergen Belsen and asked if we could leave also with the rest of our family. He screamed at her "Sind Sie wahnsinig"—Are you crazy to question the German authority?

The months went on: August, September, October, November, December 1944. Finally on Dec. 3, a rumor swept the camp that the following day we would be leaving for Switzerland. The next day was the day of departure. I was given to an elderly lady who would accompany me on a truck to the station. My parents walked the three miles from the camp to the station. When we arrived at the station it was nighttime, dark and rainy. I couldn't find my parents, and they couldn't find me. In the end, we found each other and the train began the three-day journey from northern Germany to the Swiss border. It was a miracle that the train was not hit by a bomb as heavy Allied bombing was going on all around us. On Dec. 7 we arrived at the Swiss border town of St. Margarethen.

Unbeknownst to us, Dr. Kasztner had been tirelessly negotiating with the Germans. Till the last minute the rescue was not secure. Dr. Kasztner skillfully negotiated for our release even though he had, realistically, nothing to negotiate with. Factors that helped were the declining military fortunes of the Germans, the indirect participation of the American Joint Rescue Committee, and the then newly established American War Refugee Board.

ABOVE: John Merey with his parents, Switzerland, 1945

LEFT: John Merey is the boy on the left on this Swiss magazine cover. December 1944.

From hindsight, our rescue, the Kasztner Group, was the single most successful rescue of the Holocaust under Jewish leadership.

We stayed in Switzerland for a year and a half. My uncle was a physician in Woodside, Queens. He sent us the affidavit affirming that we would not be a burden on the United States. We crossed the Atlantic on a liberty ship that was carrying war material back from Europe and arrived in Baltimore on April 27, 1946. Our first home was the back office of my uncle's medical office.

Arriving in Queens, we had arrived in paradise. I enrolled in P.S. 89 in Elmhurst and, later, Forest Hills High School. I attended Union College and graduated from VP&S in 1965. Subsequently I did an ophthalmology residency at Bellevue/NYU Medical Center. I married Dr. Daisy Breuer Merey, who would later become a family physician. We had two children and three grandchildren.

I have been in solo private practice of ophthalmology in West Palm Beach for the past 49 years and still enjoy my practice in three languages: English, Spanish, and Haitian Kreol.

Soon, though, it will be time to retire and so too will the stories of Holocaust survival quietly slip into the pages of history.

Karin Muraszko with one of her patients

PHOTOS COURTESY OF KARIN MURASZKO

● ALUMNI PROFILE

Karin Muraszko'81

By Julia Hickey Mijangos

From Patient to Resident to the National Academy of Medicine, a Pediatric Neurosurgeon Transforms Her Field

Karin Muraszko'81 learned to read at age 5, during the 13 months she spent in a full-body cast. The supine kindergartner could not play with the other kids in her New Jersey neighborhood, so books were her escape.

"I remember vividly the day I understood about how letters got together and made a word, and if you looked at the words, it was a sentence, and suddenly you can read. It opened up a world," she says.

Dr. Muraszko, a 2020 electee to the National Academy of Medicine in pediatric neurosurgery and the first woman in the United States to lead an academic neurosurgery department, was born with closed spina bifida. Latin for "split spine," the congenital anomaly restricted her spinal movement and caused her right leg to be shorter than her left. The cast, which covered young Karin's torso and right leg after a spinal fusion performed at Columbia, was progressively tilted and re-plastered to straighten her vertebrae. (Today, doctors insert a growing rod, eliminating the cast.)

"At the time I was born, spina bifida wasn't quite a death sentence, but pretty close to it," she says. Medical staff suggested putting her in an institution. Instead, her Catholic parents chose to have no more children and focused solely on Karin, who defied all predictions.

When she returned to Columbia at age 6 to have the cast removed, she remembers a subway-tiled bathroom where her mother helped her into a leg brace. The child stood, looked in the mirror, and was shocked to see herself taller, older, with long hair.

"The person I was looking at, I had never seen before," she says.

That person would score in the top 1% percent in the country on her ACT and attend Yale University, where she studied history and biology. She attended medical school at Columbia and in 1981 became the first woman admitted to the neurosurgery residency at Columbia's New York Neurological Institute, followed by training there in pediatric neurosurgery. She worked for two years at the National Institute of Neurological Disorders and Stroke at the NIH before moving to the University of Michigan in 1990. She headed the pediatric neurosurgery section, rising to the rank of professor in 2003. In 2005 she became chair, the first woman in the United States to serve in that role.

"One, I had the abilities, and I was not as disabled as people thought I would be. And two, I am innately driven and innately an optimist," Dr. Muraszko says of beating the expectations. "I view a roadblock as nothing more than an alternative journey."

A senior physician told Dr. Muraszko (a 4-foot 10-inch woman with a "handicap") that her acceptance into Columbia's neurosurgery residency was unlikely. She would need to prove herself with a list ranging from grades to board scores, research, publications, an away-rotation, and networking.

"He lit my fire because he was challenging me to do this," she says. "And I came back a year later having checked off all the boxes on the list. I said, 'So now why can't I be a neurosurgeon?'"

With a heap of tenacity and a healthy sprinkling of levity—as is her way—Karin Muraszko got into the grueling seven-year residency of her dreams.

"All learning takes some pain," she adds.

Today, she is one of the world's leading surgeons for tethered spinal cords and pediatric brain tumors.

CNN Chief Medical Correspondent Sanjay Gupta describes Dr. Muraszko as the second most powerful woman in his life after his mother. During the seven years he trained under her at the University of Michigan, she not only drilled down on his technique and judgment, but also compassionately watched for the subtle signs that his blood sugar might be dropping during long operations. Then, she would ask that nurses unwrap an apple Jolly Rancher candy, which she knew was his favorite, and place it behind his mask.

"She had no patience for whining, but she did take the time to remind me what my purpose was—as a surgeon, but also as a human," he wrote in a CNN special report. "We all need someone like Karin in our lives—someone who tells you what you need to hear, not just what you want to hear, and with a smile."

At Home in the Unknown

Speaking with Dr. Muraszko today, even at the distance of Zoom chat, is to receive the glow of a woman who, despite her reserve of knowledge, still radiates wonder. She recalls the neurosurgery she observed as a third-year medical student that made her "gaga" for the field: "I was absolutely awestruck. I had never seen anything as beautiful, anything as spectacular. It was breathtaking."

As if beholding the kaleidoscopic vaults of a cathedral, Dr. Muraszko describes the cervical-medullary junction, the region at the base of the skull where the brainstem becomes the spinal cord. It is packed with formidable under-and-overlapping anatomy: ligaments, muscles, nerves, and an artery whose disruption is incompatible with life.

This particular junction belonged to a 45-year-old man who was weak in one hand and had difficulty swallowing. The area was enlarged, but imaging at the time was unable to show why. Over eight hours, she stole glances through the residents' secondary microscope, monitoring the precise incision into the spine and how the surgeon maneuvered microinstruments to dissect the spinal cord. She marveled at the small patties that were intricately placed to prevent bleeding, at the instruments that were delicate and manipulated precisely.

"It wasn't a bloody mess. They were very careful about what they did. It was a lot of almost being persnickety, and so the operative field itself was pristine," Dr. Muraszko recalls. They removed the tumor with ultrasonic pulses of an aspirator, and the patient made an excellent recovery.

"We have just been in the middle of the most precious area of this man's body, and he looks like he is ready to walk home tomorrow," she remembers.

Not all cases, or outcomes, are as clean as the first she witnessed. Dr. Muraszko soon learned that neurosurgeons spend as much time figuring out how to get to something in the brain as they do actually being there. It's intensely gratifying when things go well and intensely saddening when they don't. Neurosurgeons work some of the longest hours.

Dr. Muraszko at her 1981 graduation

"I like that it occupied so much of my soul. Neurosurgeons are some of the smartest, hard-working people I've ever met in the hospital. And that didn't scare me. That attracted me," she says.

Dr. Muraszko chose neurosurgery because of all that was unknown at the time. And in a field with so many unknowns, pediatrics was at the edge of the edge. Case numbers were slim, and doctors often translated standard adult procedures to

kids. She saw more to be done for children and that pediatric neurosurgeons were actively tackling what others hadn't or didn't want to.

"I loved the fact that they viewed themselves as pioneers. They were doing something good, but also something for which, if they got enough knowledge, they were going to move the needle forward," she says.

The arc of knowledge in neurosurgery continues to be mapped at a rapid pace, fueled by the speed of technology. In the 1980s, the average survival rate for a child with medulloblastoma, a cancerous brain tumor, hovered above 30%. Today it is highly survivable, within the 80th and 90th percentiles. Endoscopes can be used in the middle of the brain these days. And spinal cord conditions such as Dr. Muraszko's can, in some cases, be treated in utero. While awake brain surgery was only performed on adults during her training, she has recently performed awake craniotomies in kids as young as 9.

Dr. Muraszko's research has focused on the treatment of brain tumors and hereditary neurological anomalies. She pioneered a localized injection therapy for cancer cells that float in the fluid around the brain, killing them before they permeate the nervous system. She began a prospective study to monitor how surgeries at the skull's posterior base can cause a syndrome affecting coordination, speech, and emotions. She also has studied how cerebellar tissue herniates into the spinal canal while the skull and brain are growing, which happens during a rare congenital anomaly called Chiari 1 malformation.

For these contributions and more, Dr. Muraszko was elected in 2020 to the National Academy of Medicine, which is considered one of the highest honors in the fields of health and medicine.

It's easy to assume that Dr. Muraszko pursued pediatric neurosurgery because she has spina bifida. Still, the tidiness of that conclusion obviates the reality: She is at home intellectually in the middle of the action, where some of the most challenging questions in medicine are being asked and answered, and where the stakes are high.

"I don't want to become a poster child for spina bifida or neurosurgery because I have spina bifida. I actually get upset when someone tries to ascribe it to that. I wish I could tell you that I knew all along what I was going to do, what I was going to be, but I didn't. What I tried to do was be honest with myself about what my strengths and weaknesses were, and work from there," she says.

Dr. Muraszko in the OR with Sanjay Gupta during the filming of a CNN profile

The Fabric of People

While neurosurgery places Dr. Muraszko at the operating suite's center, she wasn't always so comfortable in the spotlight. She walked with a full leg brace and built-up shoe until 2014, when an imperfect back surgery left her in a wheelchair. The teenaged Karin would desperately gravitate toward the walls at gatherings to avoid stares. Her father would lovingly tease her that she was blending into the drapes.

"When you are growing up as a child with a disability, you sometimes feel not worthy because you are different. Everyone is making judgments instantaneously the moment you move," she says. As the kid who often found herself observing others rather than participating, she became hyperperceptive.

"I can tell a conversation, what's going on with it, just watching from a distance," she says.

Her experiences also bring her closer to her young patients, and their parents trust that Dr. Muraszko knows the lives they are living. Children also bring resiliency, happiness, and honesty

to the exam room, which is a pleasure. "To walk into a room and have a family hand over to me the thing they love and consider most precious in their lives, a child, that's a pretty awesome responsibility," she says.

Dr. Muraszko reminds her residents that it is a gift to train on such exciting cases without the full duty falling on their shoulders. The enjoyment of watching both her patients and residents grow in skills and confidence over the years is immense. The same goes for her children, 17-year-old twins who were babies when she and her husband adopted them. Dr. Muraszko met Scott Van Sweringen in 1994 on a blind date arranged by an OR nurse. Speaking first on the phone, they soon realized that they had grown up five minutes from one another in Union County, New Jersey, and attended the same theaters, concerts, and restaurants.

"We had lived most of our lives either seeing or facing each other continuously. He understood my upbringing in life, and I understood his absolutely," she recalls. Scott was also resilient enough to handle being married to a neurosurgeon who is often called away. "There has to be an understanding that you orbit together because you choose to, not because one is absolutely in need of the other."

The couple collaborate on an annual volunteer mission called "Project Shunt," which Dr. Muraszko has led at the University of Michigan since 1998. She leads a team of surgeons, residents, and nurses to Guatemala City, where it's not unusual to encounter children on pallets with wheels—known to doctors as patients with untreated myelomeningocele—or with enlarged heads from untreated hydrocephalus. Scott, an architect, creates the itinerant operating suites in barebones settings to treat the indigenous Mayans for various congenital malformations.

As opposed to Guatemala, the United States is a "sterile society," Dr. Muraszko says. American commercials will often include a well-dressed kid in a wheelchair as if that were a display of diversity. "The wheelchair is kind of 'neat.' Why don't you show me someone who is working really hard with a walker or has cerebral palsy and is using crutches? Use a little bit more effort," she suggests, adding that the effort should extend to people with different cognitive abilities, such as autism, schizophrenia, or manic depression.

"We are all part of the fabric of people. There is no normal. There is only what we perceive as normal because all of us fall out of it, in some place," she says.

Dr. Muraszko thinks a lot about where she fits in that tapestry of life and what she hopes to leave behind: a husband who feels loved and respected, children who have grown to be good and kind, parents who know she hasn't squandered their enormous energy, and mentors who see she has done something with their efforts.

"We may not be remembered 100 years from now, but hopefully some little ripple of what we did is recognized as part of the world," she says.

From Silence, Memories

Although she has lived in Michigan for decades, Dr. Muraszko defines herself as a New Yorker. Watching the world go by in the Big Apple "with a good cup of coffee in a window seat in a coffee shop or a restaurant—to me, there is no better place in the world," she says.

"Neurosurgeons are some of the smartest, hardworking people I've ever met in the hospital. And that didn't scare me. That attracted me."

This is partly because the formative years of her life and medical training took place in New York, specifically at what was then known as Babies Hospital.

One night during her residency, Dr. Muraszko was rounding on the children's ward. Her path took her down a ramp between a four-bed and eight-bed room, and because the usual cacophony of the hospital had slipped into quiet, she was able to recall this same space in another time.

"Oh my God, this is the ramp I raced on when I was a kid in the hospital here."

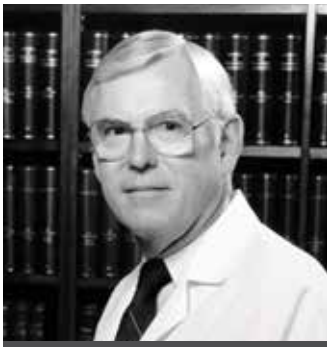
Another child had once wheeled the young Karin, who was lying flat on a stretcher after her spinal fusion, gleefully down the hill near rooms of four and eight. She remembered being rolled by nurses through the same tunnels under the hospital, which she now traversed as a doctor, to the Neurological Institute.

She remembered the very first time, as a child, that she saw how serif letters carved in stone above the hospital's entrance became words, and those words became a verse: "FOR OF THE MOST HIGH COMETH HEALING."

in memoriam

FACULTY

Robert E. Canfield, MD, professor emeritus of medicine, died Dec. 26, 2020.



Robert E. Canfield

Peter Gouras, MD, professor of ophthalmology, died Jan. 8, 2021.

Victor Grann, MD, clinical professor of medicine and Mailman clinical professor of epidemiology and health policy & management, died Oct. 4, 2020.

David Schachter, MD, retired professor of physiology & cellular biophysics, died Dec. 1, 2020.

ALUMNI

1944

Adele Olney Stevens Vail, an internist, died Nov. 26, 2020. She was 101. Dr. Vail married another alumnus in 1946, William Vail'46. She practiced in New Jersey before retiring in 1984 and was most recently living in Ignacio, Colorado. She was preceded in death by her husband and a son and is survived by another son, a daughter, and a grandson.

1949

Ed H. Updike, a surgeon who practiced for 30 years in Ocala, Florida, died Oct. 3, 2020. He was 93. After medical school, he completed a fellowship in surgery at the Mayo Clinic. During the Korean War, he served in the U.S. Navy as a doctor on troop transport ships and continued his Navy reserve service until he retired in 1987. In retirement, he moved to western North Carolina, where he enjoyed organic gardening, growing fruit trees, learning to play banjo and bass fiddle, and singing in the St. Philip's Episcopal choir. He was preceded in death by two daughters. He is survived by his wife, Lillian, three children, seven grandchildren, and three great-grandchildren.

1950

Robert S. Jampel, former chair of the Wayne State University School of Medicine's ophthalmology department and director of the Kresge Eye Institute, died Nov. 26, 2020. He was 94. After completing a neurology residency and an ophthalmic residency at the University of Michigan, Dr. Jampel received a doctoral degree in anatomy. He joined the State University of New York faculty in 1958 and in 1968 became a neuro-ophthalmologist at Columbia. In 1970 he joined Wayne State University and the Kresge Eye Institute, where an auditorium, an endowed chair, a lectureship, and an endowed prize in ophthalmology are named in his honor. He is survived by his wife, Joan, two sons, two daughters, and many grandchildren.

1951

Theresa (Long) Siebert, former chief of radiology at Point Pleasant Hospital in New Jersey, died Oct. 14, 2020. She was 93. She was one of only four women in her medical school class. She married her classmate, David Siebert'51. They moved to Wiesbaden, Germany, while David served in the U.S. Air Force. They settled in Manasquan, New Jersey, for 50 years. In 1969 she obtained a post at Point Pleasant Hospital and became radiology chief 10 years later. The couple volunteered on the medical staff for the 1980 Lake Placid Winter Olympics. David Siebert died in 2008 of Alzheimer's disease. After that, Theresa rarely spoke. She moved to Hallandale Beach, Florida, where she lived until her death. Dr. Siebert is survived by two children, two granddaughters, and three siblings.

Theresa (Long) Siebert'51

1954

Alfred Azzoni, a surgeon who practiced at North Shore Medical Group in Long Island, died Oct. 25, 2015. He was 89. Dr. Azzoni began medical school after serving in the U.S. Marine Corps during World War II and earning two Purple Hearts, a Bronze Star, and a Presidential Citation Ribbon. Dr. Azzoni served on the Heckscher Museum of Art Board of Directors, taught at the VA Hospital in Stonybrook, and volunteered for many organizations. He enjoyed playing and watching golf, the opera, and reading. His wife, Janet Azzoni'56, died more recently. (See notice in Class of 1956.) He is survived by three children and seven grandchildren.

John H. Hobart, who practiced urology for several decades in Easton and Phillipsburg, Pennsylvania, died Nov. 30, 2020. He was 91. He was born and raised in Montreal, Canada. After medical school, he trained at the University of Chicago and was a surgical fellow at the University of Pennsylvania. He then served in the U.S. Army Medical Corps in Landstuhl, Germany. He returned stateside to Easton Hospital, where his roles included director of surgery, chief of urology, trustee, and president of the hospital medical staff. He was also actively involved in the Northampton County Medical Society, Pennsylvania Medical Society (including a term as president), and the Pennsylvania Medical Society Liability Insurance Company. Known for his quick wit and wry humor, Dr. Hobart was an avid reader of history and enjoyed golf. He is survived by his wife, Joan, five children, and 10 grandchildren.

William T. Caldwell III, an ophthalmologist who loved the sea, died Jan. 8, 2021, at age 91. After medical school, he served in the U.S. Navy as a lieutenant in the medical corps and as a flight surgeon on the USS Franklin D. Roosevelt. He did his residency in ophthalmology at Columbia and built a private practice in Red Bank, New Jersey. Retiring in 1998, Dr. Caldwell was an avid fisherman and woodworker, building many intricate ship models and two boats: a DN iceboat, "Little Blue," now docked in the Mariners' Museum in Newport News, Virginia, and a wooden boat, "The Betty Boop II," on which he explored rivers, bays, and the ocean. He served as a docent at the Mariners' Museum, loved reading, and taught himself Scottish Gaelic. He is survived by his wife, Betty Ann, two daughters, four grandchildren, two great-grandchildren, and a sister.

1955

Paul Cushman Jr., an endocrinologist, died Nov. 27, 2020. He was 90. Dr. Cushman was an early champion of methadone for the management of opiate addiction and ran a highly regarded methadone clinic in New York in the 1970s. He contributed more than 80 articles to the literature

on substance-abuse medicine and worked to integrate its teaching into medical schools. In the 1980s, he taught medicine, psychiatry, pharmacology, and therapeutics at medical colleges in Wisconsin and Virginia. He wrote biographies of Dutch colonial ancestors Richard Varick, the first mayor of New York City, and silversmith William Gilbert. While a captain in the USAF in England, he met and married Paulette Bessire, and they were married for 61 years. A lover of ballet, opera, medical history, puzzles, and games, Dr. Cushman is survived by his wife, a daughter, and two grandchildren.

1956

Janet (Elderkin) Azzoni, an internist, died in her sleep on Nov. 9, 2020. She was 91. She was the Class of 1956 valedictorian. She served as a physician in Suriname and the Suffolk County School System. She was a keen investor and worked in real estate sales on Long Island. She and her husband, Alfred Azzoni'54, raised three children in Huntington, New York, before retiring to Englewood, Florida, in 1994. She enjoyed fishing and boating on the Maine coast, opera, protecting turtles for the Coastal Wildlife Club, needlepoint, and playing bridge. She was preceded in death by her husband (see notice in Class of 1954) and is survived by three children and seven grandchildren.

Janet (Elderkin) Azzoni'56

1957

Marcia Ann Kepler-Bilbao, a radiologist who graduated first in her class, died Jan. 1, 2021, two weeks before her 90th birthday. In 1955, she married physician Joseph Bilbao and by 1961 completed her internship and a radiology residency and had three children. She took on clinical radiological appointments in Oregon before joining the University of Utah Hospital in 1982. She was also chief radiologist at the VA Hospital in Salt Lake City. From 1989 until her retirement in 2002, she was chief radiologist at the Grand Junction VA Medical Center. Dr. Kepler-Bilbao was recognized for procedures for detecting early breast cancer and for her co-invention of the Bilbao-Dotter catheter to correct the narrowing of arteries. She was a mountain climber who surmounted 50 peaks and hiked the Pacific Crest Trail. She enjoyed dancing, meditation, yoga, reciting poems, and raising puppies. After her retirement, she volunteered for hospice and became a member of the Unitarian Universalist Congregation of the Grand Valley. She is survived by her second husband, William, three children, four stepchildren, and two grandchildren.

1959

Richard Samuel Baum, one of the first board-certified neonatologists in the United States, died July 3, 2020, at age 86. Dr. Baum served as a captain in the Air Force in Japan. He later taught at Harvard and created the neonatal ICU at the Methodist hospital system in Indianapolis, Indiana. He was also medical director of the NICU at St. David's in Austin, Texas. He settled in Denver after retirement and loved art, music, maps, and restaurants. He is survived by two children, two grandchildren, and a sister.

1961

Paul T. Wilson, a psychiatrist who practiced for 35 years in Bethesda, Maryland, died Aug. 28, 2020, after a five-month battle with COVID-19. He was 88. Dr. Wilson attended Columbia College, where he rowed crew.

Paul T. Wilson'61

He trained at the University of Chicago and the University of Michigan. In addition to his private practice in Bethesda, he worked for the American Psychiatric Association and taught at Georgetown University. He contributed to making parts of "The Diagnostic and Statistical Manual of Mental Disorders"—the DSM—more readable for the audience of general practitioners, medical students, and insurance companies. He was part of a committee that removed homosexuality as a pathological diagnosis from DSM-II. In 1986, Dr. Wilson published "Survival Manual" for medical students. He was predeceased in 2019 by his wife, Barbara Foley, and is survived by three children and four grandchildren.

1962

Forrest Weight Jr., an honored molecular and cellular neurobiologist at the National Institutes of Health, died unexpectedly of heart failure Nov. 14, 2020. He was 84. After medical school, he spent summers working at the NIH, where he began his long career. A year in Sweden at the University of Gothenburg led to a nearly 40-year career of researching the nervous system's molecular and cellular physiology and pharmacology. A member of numerous professional societies, Dr. Weight traveled

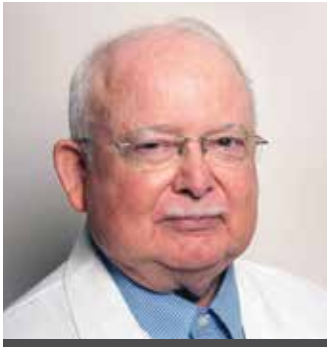
Forrest Weight Jr.'62

around the world to present his brain research. He earned the NIH Director's Award in 1994. He sang with the Washington Oratorio Society and loved chamber music, singing, skiing, travel, and Venetian architecture. Predeceased by one son, Dr. Weight is survived by his wife, Virginia, two children, two stepchildren, 17 grandchildren, and a brother.

1963

David C. Kem, who revived the endocrinology section at the University of Oklahoma Department of Medicine, died Nov. 22, 2020. He was 83. A native of Indiana, he attended a rural school before enrolling in Earlham College. After medical school, he trained at the University of Michigan. During the Vietnam War, Dr. Kem served at the Tripler Army Hospital in Hawaii as chief of the endocrine service. After the war he was recruited to the University of Texas Southwestern Medical School and later joined the University of Oklahoma. The fellowship program he created

produced 28 endocrinologists by the time he stepped down as section chief in 2001. He used his interest in teaching ethics to advise the Christian Medical and Dental Society and to co-found the annual A. Kurt Weiss bioethics lectureship. He enjoyed tennis, woodworking, camping, and



David C. Kem'63

classical music and led a Bible study fellowship. He is survived by his wife, Janet, five children, 21 grandchildren, three great-grandchildren, and two brothers.

1966

Louis "Lou" E. Hildebrand, a pathologist, died suddenly on New Year's Day 2021 at age 80 after spending New Year's Eve with his family. After medical school, he entered the U.S. Army, obtaining the rank of major. His specialty was pathology, but he held a family practice for a time in Stockton/Lodi, California. When he and his wife moved to Missouri, he returned to pathology, eventually retiring from Saint Francis Medical Center in Cape Girardeau. He was accomplished in various interests, including memorizing and reciting whole books of the Bible, organic gardening, raising prize roses, cycling, playing the piano, and writing worship songs. He also published crossword puzzles for newspapers, including the New York Times. He is survived by his wife, Fran, three daughters, five grandchildren, and two sisters.

1971

Peter Forshew Migel, a pediatrician, died Oct. 27, 2013. He was 68. While in training at what was then Columbia-Presbyterian Medical Center, he served as chief resident of pediatrics from 1975 to 1976. In 1976, Dr. Migel was a founding partner of Tenafly Pediatrics in Tenafly, New Jersey, where he practiced for 20 years. He was chief of pediatrics at Englewood Hospital in New Jersey from 1988 to 1990. In 1996, he began a practice specializing in developmental and behavioral pediatrics. He is survived by his wife, Terry, three children, and five grandchildren.

1976

Andrew "Andy" Glenn Israel, a general internist, died Oct. 28, 2020, after an eight-year battle with posterior cortical atrophy, a rare form of early-onset Alzheimer's disease. He was 68. He met his future wife during medical school when she visited her father, who was his patient. Dr. Israel completed his internship and residency at UC San Diego and later founded Hillcrest Internal Medicine in San Diego. He was instrumental in fundraising as a board member of the Mercy Foundation. He was voted a Top Doctor

Andrew "Andy" Glenn Israel'76

annually by his colleagues from 2004 until he retired in 2013. Skilled as a diagnostician, Dr. Israel had a case included in the "Diagnosis" column of the New York Times Magazine in 2008. He loved traveling and time with family, instilling life lessons such as "a clean car drives better" and "always use the right tool for the job." He is survived by his wife, Dr. Sonia Ancoli, two children, four grandchildren (who knew him as "Poppa Flash"), and two sisters.

1978

Mark Steiner, who was the Harvard football team's physician, died Dec. 17, 2020. He was 70. Born in East Lansing, Michigan, Dr. Steiner attended Harvard and played as a starting defensive lineman on its football

Mark Steiner'78

team. After medical school, he trained at Massachusetts General Hospital. There he met his wife and became chief of the orthopedic sports medicine service at New England Baptist Hospital. He authored dozens of research papers and developed several innovative medical devices. Medicine allowed him to return to Harvard Stadium as its team physician. He was a fan of double bogey Ivy League golf, conservative politics, and sailing. His favorite place on Earth was the "cove" on Glen Lake in Michigan. Dr. Steiner was diagnosed with progressive supranuclear palsy in 2017. He is survived by his wife, Dr. Mary Ellen McCann, three children, three grandchildren, and two siblings.

1986

Fred M. Carter II, an orthopedic surgeon, died unexpectedly Nov. 19, 2020. He was 60. He trained at St. Luke's-Roosevelt Hospital and the University of Medicine and Dentistry of New Jersey. He also completed a fellowship in sports medicine at the Emory Orthopaedic and Spine Center and an orthopedic research fellowship at the George L. Schultz Laboratories for Orthopaedic Research. Dr. Carter's career began on his native Long Island at South Shore Orthopedic Associates. In 2001, he and his family moved to the North Fork, where he established North Fork Orthopedic & Sports Medicine. He was a storyteller, a soccer coach, and a fishing enthusiast who delighted in gathering his family together to watch live college sports at his children's alma maters. Dr. Carter is survived by his wife, Martha, and three children.

2013

Lauren Brinkerhoff, an anesthesiologist, died Aug. 16, 2020, from a respiratory illness complication. She was 35. Dr. Brinkerhoff graduated summa cum laude from Cornell University in 2006 with a degree in biological sciences. After completing a dual MD/MPH from Columbia, she began a residency at the University of Rochester School of Medicine. She had an immense desire to improve the quality of life for those around her. While in Rochester, she discovered an interest in medical technology innovations, worked as a special projects consultant, and contributed to the formation of several startup companies.

COURAGE AND CONFECTION

CHARLES ADLER'S STORY IS A CLASSICALLY, UNIQUELY AMERICAN ONE, WITH HOPE ECLIPSING DANGER, SUCCESS, AND GIVING BACK.

He and his family fled Nazi Germany when Charles was 11 years old, and, thanks to an aunt who lived in Washington Heights, settled in New York. As a child, Charles sold hot dogs and chocolates on the streets of northern Manhattan, and after serving in the U. S. Navy in World War II, led the candy company founded by his father with extraordinary innovation, making sugar-free candies and chocolates. Inspired by the German chocolate-making he remembered from his early childhood, Charles built Estee Foods into a powerhouse in the industry.

Grateful for the opportunities that his country provided for him and his family, Mr. Adler wanted to pay it forward. During his lifetime, he gave over $5 million to VP&S, and his planned gift of $10 million, to the Taub Institute and the Department of Neurology, ensures that the vital work of our faculty will continue, and that Mr. Adler's name will forever be associated with our institution. His daughter, Melody, continues her father's legacy of generosity, and the family's support is proving invaluable in our fight against Alzheimer's, Parkinson's, and literally every neurodegenerative disorder.

You can leave a legacy that will influence the practice of medicine at Columbia, and serve generations of doctors and scientists, and those they care for. To learn more about making a planned gift, please contact our Planned Giving team at **212-342-2108**, or at **dev_plannedgiving@cumc.columbia.edu**

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EILEEN BARROSO

Match Day 2021

At an in-person but physically distanced event on March 19, members of the VP&S Class of 2021 celebrated results of this year's residency match. Results were sent to match participants via email at noon, but students were invited to visit the lobby of the Vagelos Education Center later in the afternoon to receive congratulations from the medical education deans.

The most popular matches for the 154 VP&S students who participated: internal medicine (27 students), psychiatry (16), pediatrics (15), surgery (11), obstetrics & gynecology (9), anesthesiology (9), and orthopedic surgery (8).

"We are delighted with the match results," says Lisa Mellman, MD, senior associate dean for student affairs. "The class matched extremely well into their specialties of choice despite the pandemic-impacted year that included a pause in clinical rotations, no away electives, and virtual interviews. We are incredibly proud of the class and grateful to our faculty and departments for their support of our students in this very challenging match year."