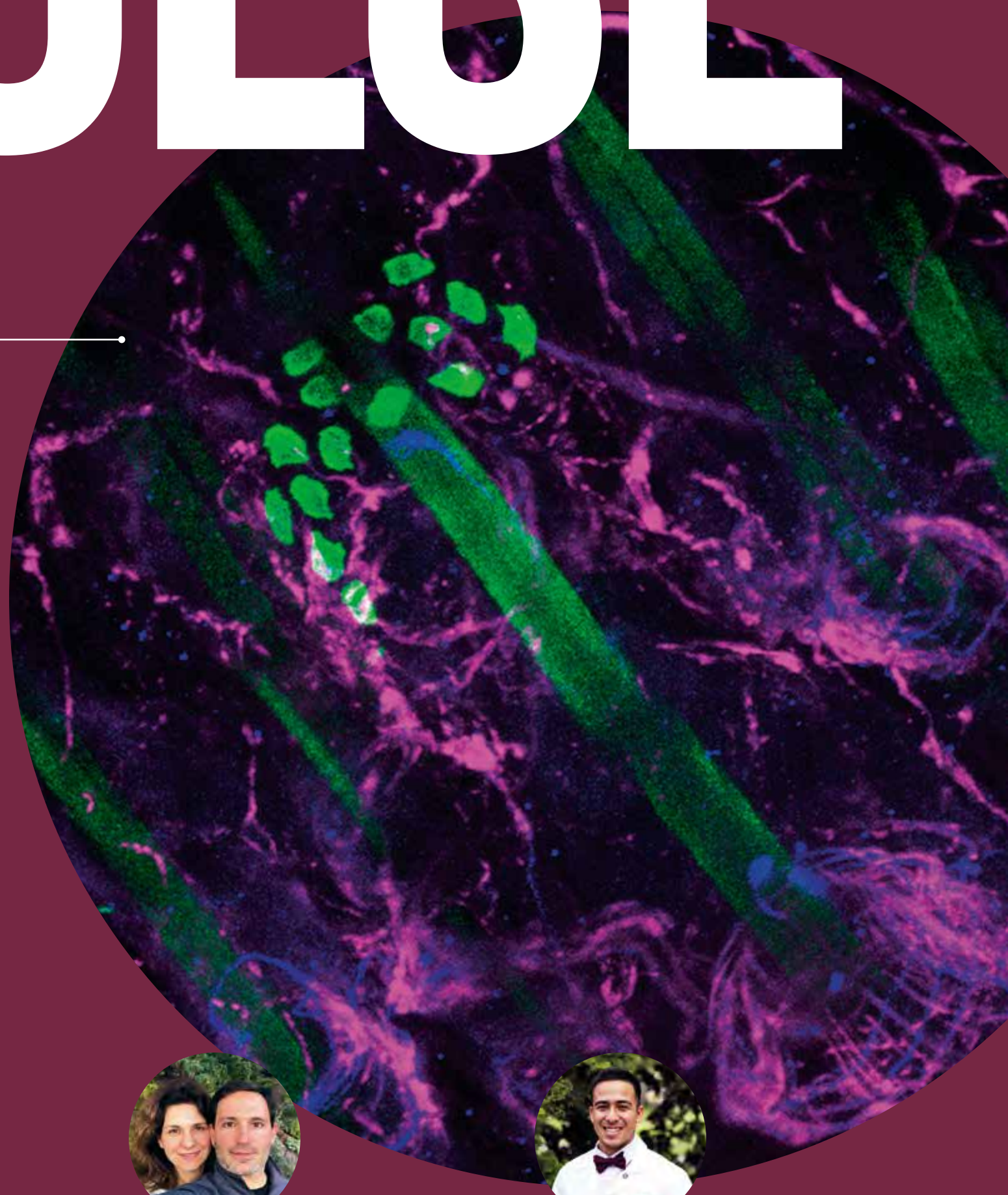
HARVARD MEDICAL SCHOOL

CELEBRATING THE HEART AND IMPACT OF THE HMS COMMUNITY

PULSE

SPRING 20

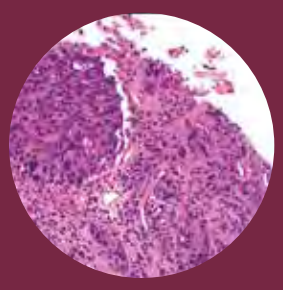


FEATURED STORY

UNRAVELING THE BIOLOGY OF AUTISM

Philanthropists Lisa Yang and Hock Tan establish research center at HMS to target autism's basic biology

02



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Couple establish fellowship to help health sciences and technology students flex their research brains

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Luria bequest assures that all talented students have the opportunity to attend HMS

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CUTTING-EDGE RESEARCH

SOLVING THE MYSTERY OF AUTISM

New research center aims to unravel the basic biology of autism and related disorders

MICHAEL GREENBERG
AND LISA YANG

HOCK TAN

Autism—a constellation of neurodevelopmental conditions affecting 1 in 59 children in the U.S. alone—has become one of modern medicine's most confounding mysteries. This condition is believed to arise from the complex interplay between genes and environment, yet its basic biology remains largely a black box.

Now, a new research effort at Harvard University led by Harvard Medical School is poised to identify the biologic roots and molecular changes that give rise to autism and related disorders with the goal of informing the development of better diagnostic tools and new therapies.

Harvard University has received a $20 million gift from philanthropists Lisa Yang and Hock Tan, MBA '79, to establish the Hock E. Tan and K. Lisa Yang Center for Autism Research at HMS. This gift brings the total autism-related research funding provided by Yang and Tan to nearly $70 million. "There is an urgent need to understand the fundamental biology of autism," says the center's inaugural faculty leader, Michael Greenberg, PhD, the Nathan Marsh Pusey Professor and chair of the Department of Neurobiology in the Blavatnik Institute at HMS. "I strongly believe that the multidisciplinary expertise convened by this center will propel us into a new era of autism research, enhancing our understanding of the condition and yielding critical new insights into its causes. This generous gift will be transformative for the field."

Cross-pollination

Working under the premise that autism's complexity demands the cross-pollination of diverse expertise across different modes of scientific inquiry, the center will encompass the efforts of basic, translational, and clinical scientists from the entire Harvard ecosystem. The center will have its administrative home within the Harvard Brain Science Initiative, which brings together researchers from HMS and its affiliated hospitals as well as from the Harvard Faculty of Arts and Sciences, Harvard T.H. Chan School of Public Health, and Harvard John A. Paulson School of Engineering and Applied Sciences.

"Neuroscience has reached a unique inflection point. Advances such as single-cell analysis and optogenetics, coupled with an unprecedented ability to visualize molecular mechanisms down to the minutest level, will enable today's researchers to tackle a disorder as dauntingly complex as autism," says HMS Dean George Q. Daley, AB '82, MD '91, PhD.

"WE ARE EXCITED AND HOPEFUL THAT THESE SIBLING CENTERS AT HARVARD AND MIT—TWO POWERHOUSES OF BIOMEDICAL RESEARCH—WILL COLLABORATE IN A SYNERGISTIC WAY AND BRING ABOUT CRITICAL NEW INSIGHTS TO OUR UNDERSTANDING OF AUTISM."

LISA YANG

"Medical history has taught us that truly transformative therapies flow only from a clear understanding of the fundamental biology that underlies a condition," Daley added. "This gift will allow our researchers to generate critical insights about autism and related disorders."

Investigators at the new center will collaborate with peer researchers at MIT and complement efforts underway at the Hock E. Tan and K. Lisa Yang Center for Autism Research at the McGovern Institute for Brain Research at MIT. The unique strengths of each institution will converge toward

HMS LEADS EXTRAORDINARY COLLABORATION TO CURB COVID-19

ARLENE SHARPE, HEAD OF THE DEPARTMENT OF IMMUNOLOGY AT HMS, AND BRUCE WALKER, DIRECTOR OF THE RAGON INSTITUTE OF MGH, MIT AND HARVARD, DISCUSS HOW TO CONTROL COVID-19 DURING A MARCH MEETING AT HMS ATTENDED BY DOZENS OF BOSTON-AREA SCIENTISTS.

Harvard Medical School has convened other top medical schools in Massachusetts, including Boston University School of Medicine, Tufts University School of Medicine, and University of Massachusetts Medical School, as well as the region's biomedical community, hospitals, pharmaceutical firms, research institutes, foundations, and government representatives to collectively take on the threat of coronavirus disease 2019 (COVID-19). The mission of the Massachusetts Consortium on Pathogen Readiness (MassCPR) is to develop and invest in the research and infrastructure needed to address the threat posed by COVID-19, as well as to better position the world for future emerging pathogens.

"The novel coronavirus is a public health crisis of cataclysmic proportions," says HMS Dean George Q. Daley, AB '82, MD '91, PhD. "It compels us to forge new levels of collaboration across Boston, Cambridge, and beyond."

Supported by $115 million in funding from the China Evergrande Group and working in partnership with the Guangzhou Institute of Respiratory Health in Guangzhou, China, MassCPR is led by Daley and faculty co-directors Arlene Sharpe, AB '75, AM '76, PhD '81, MD '82, and Bruce Walker, MD. Sharpe is the George Fabyan Professor of Comparative Pathology and chair of the Department of Immunology in the Blavatnik Institute at HMS, as well as co-director of the Evergrande Center for Immunologic Diseases at HMS and Brigham and Women's Hospital. Walker is the Phillip T. and Susan M. Ragon Professor of Medicine at Massachusetts General Hospital and HMS and director of the Ragon Institute of MGH, MIT and Harvard.

In April, the consortium began awarding funding of up to $500,000 for projects in six key areas related to COVID-19: epidemiology, pathogenesis, diagnostics, therapeutics, vaccines, and clinical management.

READ THE LATEST COVID-19 INSIGHTS FROM THE HMS COMMUNITY AT TINYURL.COM/HMS-CORONAVIRUS-RESPONSE

HOW TO HELP

If you would like to advance HMS research via the COVID-19 Response and Research Fund or support HMS students via the Student Emergency Aid Fund, go to **hms.harvard.edu/give** and select one of these funds from the dropdown menu.

a shared goal: understanding the roots of autism, explaining the condition's behavior and evolution, and translating those insights into novel approaches to treat its symptoms.

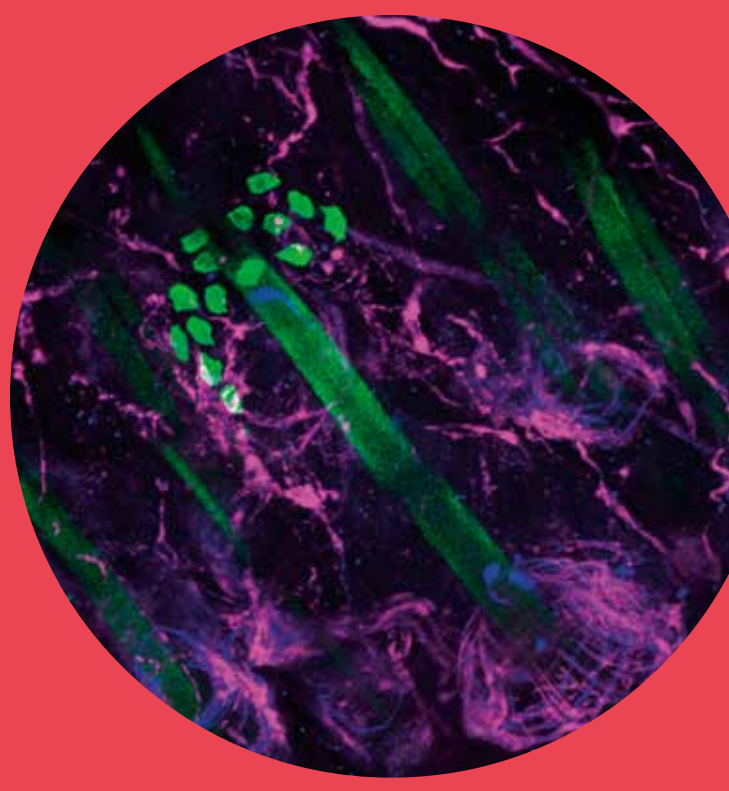
"We are excited and hopeful that these sibling centers at Harvard and MIT—two powerhouses of biomedical research—will collaborate in a synergistic way and bring about critical new insights to our understanding of autism," says Yang.

Announced in January, the first of two projects to be supported by the center focuses on critical periods in brain development, investigating the role that genes implicated in autism play in brain development and plasticity. Led by Greenberg, the team includes Michela Fagiolini, PhD, associate professor of neurology at Boston Children's Hospital (BCH); Chinfei Chen, MD '91, PhD '91, professor of neurology at BCH; and Christopher A. Walsh, MD, PhD, the Bullard Professor of Pediatrics and Neurology at HMS and BCH and chief of the Division of Genetics at BCH.

The second project concentrates on the role of sensory experience and social behavior. Led by David Ginty, PhD, the Edward R. and Anne G. Lefler Professor of Neurobiology in the Blavatnik Institute at HMS, the team includes Sandeep Robert "Bob" Datta, MD '04, PhD '04, associate professor of neurobiology in the Blavatnik Institute at HMS; Catherine Dulac, PhD, the Higgins Professor of Molecular and Cellular Biology at Harvard University; and Lauren Orefice, PhD, assistant professor of genetics at HMS and Massachusetts General Hospital.

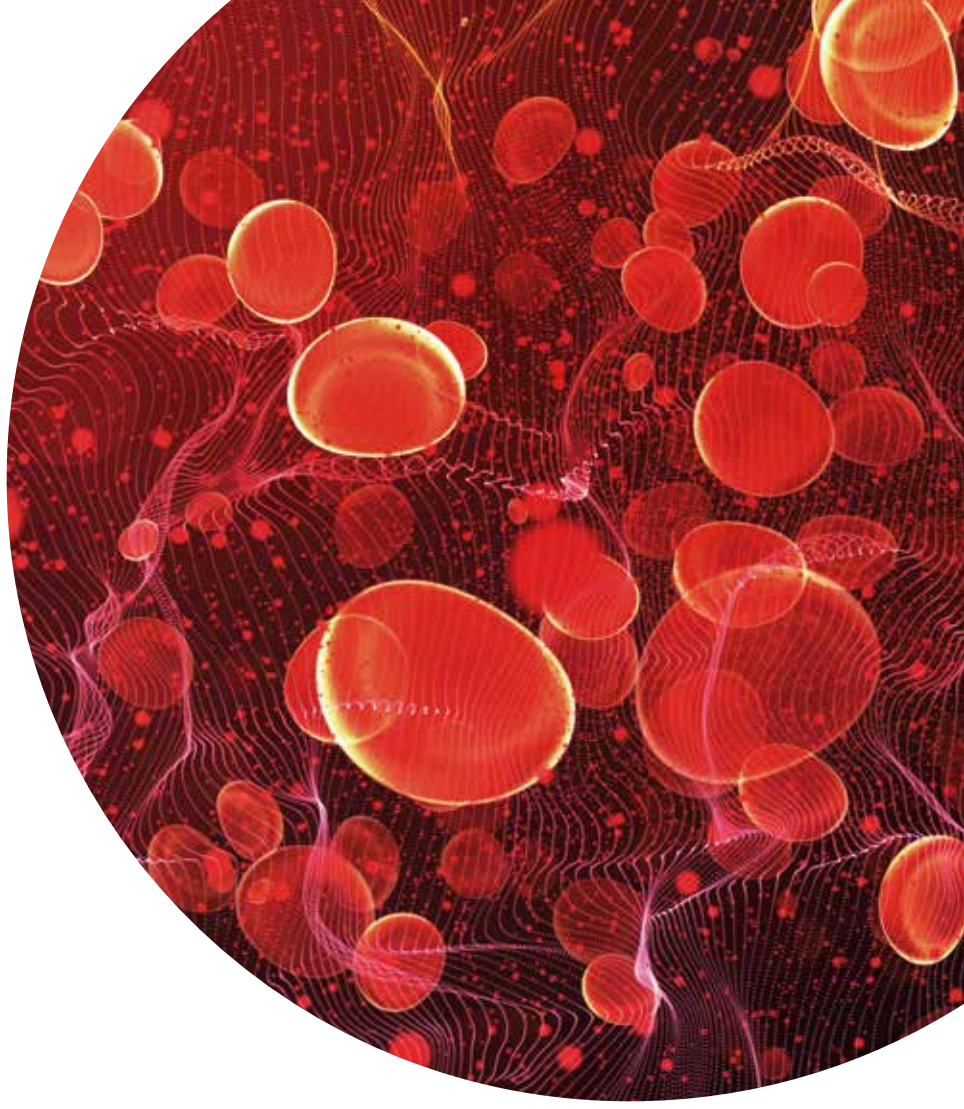
Recent research from neurobiologists and geneticists at Harvard Medical School has not only identified the molecular changes that give rise to heightened touch sensitivity in autism spectrum disorders but also points to a possible treatment for the condition.

THIS IMAGE FROM THE LAB OF LAUREN OREFICE DEPICTS SENSORY NEURON ENDINGS (IN PURPLE AND BLUE) IN THE SKIN WRAPPING AROUND HAIR FOLLICLES (IN GREEN) AND A "TOUCH DOME" OF CELLS THAT HELPS TO TRANSMIT CERTAIN TYPES OF TOUCH INFORMATION TO THE NEURONS (ALSO IN GREEN). RECENT WORK FROM HMS HAS FOUND THAT THESE NEURONS, WHICH ARE THE FIRST STEP IN THE DETECTION OF LIGHT TOUCH, MAY BE A POTENTIAL THERAPEUTIC TARGET FOR SOME FEATURES OF AUTISM AND RELATED DISORDERS.



CUTTING-EDGE RESEARCH

MAPPING THE HUMAN BODY, CELL BY CELL



RED BLOOD CELLS TRAVEL THROUGH THE BODY.

Over the past two decades, researchers have made extensive efforts to define the body from the inside out through various large-scale, international ventures, such as the Human Genome Project, the Human Epigenome Project, and the Human Proteome Project.

Now, research groups around the world are working on a new reference guide that will add unprecedented insight into cells' roles in health and disease. The Human Cell Atlas (HCA) will outline the body's incredible variety of cells and map how each of them relates to one another and communicates in 3D space.

Recently, the Chan Zuckerberg Initiative (CZI)—established by Facebook founder Mark Zuckerberg and his wife, Priscilla Chan, AB '07—awarded nearly $8 million in grants to support the work of three researchers in the Blavatnik Institute at Harvard Medical School who are engaged in HCA projects: Jonathan G. Seidman, AB '72, PhD, the Henrietta B. and Frederick H. Bugher Foundation Professor of Genetics; Allon Klein, PhD, an associate professor of systems biology; and Peter Kharchenko, PhD '05, the Gilbert S. Omenn, MD '65 Associate Professor of Biomedical Informatics.

Using a grant of $4 million split among eight institutions in the U.S. and Europe, Seidman and his colleagues are investigating how RNA differs from cell to cell, using technology that traces each cell to its unique location. The team intends to build a reference atlas from healthy human hearts that could not be transplanted in patients. This information will eventually form the basis, Seidman says, for determining what processes might go wrong within these cellular populations in cardiac disease.

"Out of an adult human's 37 trillion cells, the heart alone is about 5 billion," Seidman says. "The prevailing view used to be that this structure was simply made of muscle and non-muscle cells, but now we know that the real picture is far more complicated."

Klein, whose work centers on stem cells, will probe a system that is rich in cells continually differentiating into a variety of fates: bone marrow hematopoietic cells, which make up every component of blood.

The Human Cell Atlas will be organizing and standardizing terabytes of data for billions of cells, across multiple modalities, generated by hundreds of labs around the world.

"We can think of this in much the same way as having a very accurate map of continents or seas that allows ships to navigate new horizons," Klein says. "If we want to understand the physiology of tissues or how they're affected by disease, having a very detailed map of these tissues is an important prerequisite."

"WE'RE EXCITED TO SUPPORT INVESTIGATORS AT HARVARD WHO ARE PART OF INTERNATIONAL, INTERDISCIPLINARY COLLABORATIONS THAT ARE ACCELERATING PROGRESS TOWARD A FIRST DRAFT OF THE HUMAN CELL ATLAS."

JONAH COOL

Toward that end, he and his colleagues—across six labs at HMS and its affiliate hospitals—will use a $2 million grant to analyze bone marrow cells collected clinically, characterize different cell types by single-cell sequencing, and track changes in these cell populations over time.

With a $1.75 million grant split among three labs at HMS and its affiliates, Kharchenko and his team will investigate the spatial organization of lymph nodes using single-cell analysis and will also study how these cells interact.

"We can analyze gene expression to give us a detailed catalog of what kinds of cells are present in lymph nodes, which is very useful—it's like having a list of actors in a play," he says. "But what we can't derive from this list is how they talk to each other."

New techniques developed within HMS and beyond will provide insight into this communication, Kharchenko says. His own lab will use computational techniques and statistical models to interpret the generated data.

"We're excited to support investigators at Harvard who are part of international, interdisciplinary collaborations that are accelerating progress toward a first draft of the Human Cell Atlas," says CZI Science Program Officer Jonah Cool. "These networks of experts across scientific fields and time zones are demonstrating the advances in science that are possible when people pursue common goals."

FINANCIAL AID AND EDUCATION

EASING STUDENTS' FINANCIAL FEARS

Alicia Barba, MD '97, was raised to value education. Now a dermatologist and founder of two centers for medical and cosmetic skin treatments, she credits her time at Harvard Medical School as an important factor in her success.

DERMATOLOGIST ALICIA BARBA (LEFT) ESTABLISHED A SCHOLARSHIP FUND NAMED AFTER HER PARENTS, ANGEL AND ALICIA BARBA.

"THIS GIFT WAS INSPIRED BY HMS STUDENTS."

ALICIA BARBA

Barba knows firsthand that medical education is expensive and feels it is a privilege to be able to graduate without an overwhelming amount of debt. As a result, she recently established the Angel and Alicia Barba Endowed Scholarship Fund, which she named after her parents in recognition of the support and encouragement they gave to all six of their children.

"This gift was inspired by HMS students," says Barba, who has had the opportunity to interact with current students through an annual dinner that she and her classmate David J. Brown, MD '97, host in coordination with HMS's Office of Recruitment and Multicultural Affairs. "This time allows me to reflect on when I was in their shoes. It really seems like yesterday to me. It was such an exciting time in my life." Barba's preference is to support first-generation Latino students because she wants to see more people like herself represented at HMS and in medicine. "I know that some recipients could be DACA (Deferred Action for Childhood Arrivals program) students who may not have the same access to low-interest loans or other resources. I want these students to have the opportunity to graduate with minimal debt and go on to do great things," she says.

One such student—and a past recipient of Barba's support—is Blanca Morales, HMS Class of 2020. "After wondering if an immigrant such as myself could ever be the first person in her family to don a white coat, the generous support of alumni like Dr. Barba lessened my fear about the financial struggles I would face and allowed me to fully immerse myself in the task of being a medical student," says Morales.

N. SCOTT ADZICK LEADS A TEAM PERFORMING FETAL SURGERY FOR SPINA BIFIDA.

FINANCIAL AID AND EDUCATION

SUPPORTING FUTURE SURGEONS

N. Scott Adzick, AB '75, MD '79, says his motivation for giving back to Harvard Medical School is simple: immense gratitude.

"IF I CAN HAVE AN IMPACT ON ONE, TWO, OR THREE STUDENTS, THAT'S A WONDERFUL THING."

N. SCOTT ADZICK

When Adzick was 11, his mother was diagnosed with breast cancer. She had a radical mastectomy and received cobalt radiation therapy, eventually overcoming the aggressive disease. Adzick's deep appreciation for the surgeon who cared for his mother launched his interest in a career in medicine. Years later, when he applied to medical school, an HMS scholarship allowed him to accept his offer of admission and pursue his dream.

Now the surgeon-in-chief at Children's Hospital of Philadelphia, Adzick is also the founder and director of the hospital's Center for Fetal Diagnosis and Treatment. As an active pediatric general and thoracic surgeon, he performs over 400 operations a year and has made pioneering contributions to the practice of fetal surgery.

Adzick attributes his success to the mentorship he received as an HMS student from surgeons such as Judah Folkman, MD '57, Francis D. Moore, AB '35, MD '39—both now deceased—and W. Hardy Hendren III, MD '52. Now, he hopes to return the favor and help the next generation of students by giving $250,000 to establish an endowed scholarship fund at HMS, with a preference for students expressing an interest in surgery.

"If I can have an impact on one, two, or three students, that's a wonderful thing," Adzick says.

FACES OF HMS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Ellen Gordon, GSA ’69 (second from right), a member of the HMS Board of Fellows, attends the fifth annual research day for the Ellen R. Gordon and Melvin J. Gordon Center for the Cure and Treatment of Paralysis at Spaulding Rehabilitation Hospital and HMS. She’s accompanied by three of her daughters (from left): Lisa Gordon, AB ’93; Karen Gordon Mills, AB ’75, MBA ’77; and Wendy Gordon, AB ’80, MD ’88.

02
During an October event organized by the Harvard Global Advisory Council, David Rubenstein (right), co-founder and co-executive chairman of The Carlyle Group and a member of the Harvard Corporation, interviews Len Blavatnik, MBA ’89, founder and chairman of Access Industries and the namesake of the Blavatnik Institute at HMS, about business, philanthropy, and biomedical research.

03
The HMS Center for Primary Care and the Center for Community Health and Health Equity at Brigham and Women’s Hospital jointly sponsored the 2019 Primary Care Conference, which drew hundreds of students, clinicians, clinical faculty, and interprofessionals from the Boston health care community. The October event offered a poster session and an array of talks and workshops exploring primary care challenges and solutions.

04
In September, residents, fellows, and program directors at all HMS-affiliated hospitals enjoyed a reception in Gordon Hall hosted by HMS Dean George Q. Daley, AB ’82, MD ’91, PhD, and HMS Dean for Medical Education Edward M. Hundert, MD ’84.

05
The Harvard/MIT MD-PhD Program marked its 45th anniversary in November with an academic symposium featuring distinguished alumni speakers, a cocktail hour, a scientific symposium, and a dinner party. Current MD-PhD students toasted Loren Walensky, MD, PhD (left), director of the program and an HMS professor of pediatrics at Dana-Farber Cancer Institute.

06
Phyllis I. Gardner, MD ’76, professor of medicine at Stanford University School of Medicine, hosted an alumni reception in her California home in November. Fellow HMS Board of Fellows member Alan C. Yeung, MD ’84 (left), The Li Ka Shing Professor in Cardiology at Stanford University School of Medicine, served as event co-host, while HMS Dean for Medical Education Edward M. Hundert, MD ’84 (right), spoke to attendees about the future of medicine.

07
Howard Hiatt, MD ’48, a professor of medicine at Brigham and Women’s Hospital and former dean of the Harvard T.H. Chan School of Public Health, greets political theorist and classicist Danielle Allen, AM ’98, PhD ’01, the James Bryant Conant University Professor and director of the Edmond J. Safra Center for Ethics at Harvard, before the 2019 George W. Gay Lecture, hosted by the HMS Center for Bioethics. At left is the center’s executive director, Christine Mitchell, MS, MTS ’82, a lecturer on global health and social medicine at HMS. Allen delivered the Gay Lecture’s keynote speech, titled “Human Choice in a Hyper-Technological Age.”

08
Collin Stultz, AB ’88, MD ’97, PhD ’97 (left), a professor of electrical engineering and computer science at MIT and a cardiologist at Massachusetts General Hospital, delivered the keynote speech—on machine learning models for clinical medicine—in December at the Gilbert S. Omenn Lecture. Hosted by the Department of Biomedical Informatics in the Blavatnik Institute at HMS, the annual lecture is made possible through the generosity of Gilbert S. Omenn, MD ’65, PhD (right), who was central to the formation of the department.

09
Sitaram Emani, MD ’97, chats with Lauren Kieff at the Annual Appreciation Dinner for HMS volunteers and members of the Dean’s Council, HMS’s leadership annual giving society. The dinner was held in February at the Hotel Commonwealth.

10
Molecular biologist Dario Bonanomi, PhD, was a featured speaker at the Malnisio Science Festival in Italy last October. Bonanomi has been group leader of the Molecular Neurobiology Laboratory at IRCCS Ospedale San Raffaele, a university and research hospital in Milan, since 2015, when he left his position in the U.S. to return to Italy after winning a Giovanni Armenise-Harvard Foundation Career Development Award.

FINANCIAL AID AND EDUCATION

GRATEFUL FINANCIAL AID RECIPIENTS GIVE BACK

Christoph Westphal, MD '98, PhD '98, and Sylvia Westphal, PhD '98, appreciate Harvard Medical School's efforts to promote and celebrate a diverse community—Christoph as a son of immigrants who came to the U.S. after completing medical school in Germany, and Sylvia as a college graduate from Puerto Rico.

Christoph's mother became a primary care physician, while his father became a scientist at the National Institutes of Health. To pay tribute to them, Christoph and Sylvia have named their new scholarship fund at HMS—established with a $250,000 gift—the Heiner Westphal, MD and Frauke Westphal, MD Scholarship Fund. This recent gift pushes their HMS giving total over $600,000.

"We wanted to honor my parents' legacy of helping others and their dedication to medicine," Christoph says. He calls HMS "a collection of the most amazing human beings" and says that he and his wife—who met at HMS and were both recipients of financial support—aimed to create a fund to help students who need financial assistance in order to "afford this amazing education."

Jennifer Potter, MD '87, advisory dean of the William Bosworth Castle Society—the society to which Christoph belonged as a student—and a professor of medicine at Beth Israel Deaconess Medical Center, emphasizes that financial aid gifts are critical to the School's work toward developing a diverse and inclusive community.

"Scholarships help Harvard Medical School recruit and support minority and underrepresented medical students, enabling them to form enduring connections and continue their growth and development as future HMS-affiliated residents and faculty members," Potter says.

Alumnus Christoph Westphal calls HMS "a collection of the most amazing human beings."

CHRISTOPH WESTPHAL

SYLVIA WESTPHAL

FINANCIAL AID AND EDUCATION

SCHOLARSHIP SUPPORT PROPELS PEDIATRICS PURSUIT

Benjamin Landwersiek, HMS Class of 2021, is very clear about the role financial aid has played in his Harvard Medical School journey. "I would not be able to go to medical school without financial aid support," says Landwersiek, a beneficiary of the Kathleen M. and Laurence E. Paul, MD '90 Endowed Scholarship Fund, which recently received another significant contribution from the Pauls.

"I WOULD NOT BE ABLE TO GO TO MEDICAL SCHOOL WITHOUT FINANCIAL AID SUPPORT."

BENJAMIN LANDWERSIEK

Before coming to HMS, Landwersiek explored career paths outside of medicine. He knew that he wanted to work with children, having grown up with a dozen or so younger cousins whom he enjoyed teaching. While an undergrad at the University of Rochester, he tutored refugee children in English and biology and helped K-3 students in the local school system. During the summer, he worked as a youth mentor for a Hispanic community program.

After college, Landwersiek received a Fulbright scholarship to teach middle school children English and biology in a neighborhood outside of Madrid, where he also played guitar and sang for patients in Madrid's hospitals. He says he realized that he wanted "to help kids not only learn, but be proactive about their health."

After returning to the U.S., he worked as an assistant under pediatric dermatologist Deborah Goddard, AB '98, MD '05, and fell in love with clinical medicine and building relationships with patients.

"The effect her compassion and understanding had on patients made me want to be the exact same kind of clinician," he says. Goddard encouraged him to apply to HMS, and he was accepted in 2017. He hopes eventually to apply for residency in either child psychiatry or pediatric ear, nose, and throat surgery.

"Financial aid continues to be absolutely essential to educating the next generation of physicians," says Laurence Paul, AB '86, MD '90, who is a member of the HMS Board of Fellows and co-chair of the Advisory Council on Education. "It remains of paramount importance that Harvard continues to attract the best students and that the cost of a medical education is never a deterrent for any student to attend HMS."

HMS STUDENT BENJAMIN LANDWERSIEK CELEBRATES WITH HIS SISTER BRIANNE AFTER RECEIVING HIS WHITE COAT.

ADDRESSING A CRITICAL NEED

It is impossible to ignore the crisis of mounting student loan debt. According to Forbes, education debt in the U.S. has surpassed $1.5 trillion and burdens about 45 million borrowers of all backgrounds and ages, outpacing both credit card and auto loan debt.

At Harvard Medical School, about 76 percent of MD students receive need-based financial aid, yet many still graduate with considerable debt—a reality that deeply concerns HMS Dean George Q. Daley, AB '82, MD '91, PhD, who calls student loan debt "a source of increasing stress" for students.

"It may pressure them to choose higher-paying specialties rather than following their ideals to serve communities," Daley says. "We continue to seek philanthropic support for financial aid. It's critical to ensuring that the best and brightest students can attend Harvard Medical School regardless of their ability to pay."

Stephen Sherwin, MD '74, is among those heeding that call. He experienced the impact of financial aid firsthand, having used a mix of scholarships and loans to pay for medical school. In 2000, he established the Samuel B. Sherwin Memorial Endowed Scholarship Fund at HMS in honor of his father, an aeronautical engineer who placed a tremendous value on education. Sherwin has made significant gifts to this scholarship fund in recent years with the goal of supporting a full scholarship for a medical student.

"People don't realize the extent to which medical school tuition costs have escalated, while financial aid resources have not kept pace," says Sherwin. "There's never been a greater need for financial aid. Dean Daley clearly gets it."

Arish Ali and Sudha Varadarajan, MBA '07, are also supporting financial aid at HMS. Varadarajan, an entrepreneur interested in health and wellness, serves on the HMS Global Health and Service Advisory Council—an experience she finds to be "extremely meaningful." The couple recently gave $100,000 to establish a current-use fund for deserving students in the HMS Master of Medical Sciences in Global Health Delivery Program.

"This funding also ensures that I'm giving back to Harvard, which made me who I am. I owe a lot to the University," Varadarajan says.

The University's commitment to international education and research motivated the Chi-Li Pao Foundation USA to make its latest financial aid gift to HMS. The foundation, which is focused on improving the lives of Chinese people through the support of medical education and health care projects, recently made a current-use gift of $100,000 to provide scholarship support to participants in the HMS China Clinical Scholars Research Training Program. Run by the Office for External Education, this 12-month blended-learning course provides a deep knowledge of the practice of clinical research.

"THERE'S NEVER BEEN A GREATER NEED FOR FINANCIAL AID."

STEPHEN SHERWIN

"Although many leading scholars in China have had the benefit of high-quality research training in the U.S., the vast majority of scholars in China have not had the same opportunity. This program helps bridge the gap," says Gloria S. Kim, MD, Chi-Li Pao Foundation USA trustee.

Kim says the foundation believes the program can do more than equip scholars with clinical research skills. "We hope the emphasis on team learning and problem-solving will encourage the sharing of knowledge for the betterment of all mankind. We believe by helping others, we help ourselves," she says.

OPTOGENETICS PIONEERS RECEIVE WARREN ALPERT FOUNDATION PRIZE

Four scientists were celebrated for their seminal contributions to the field of optogenetics at the Warren Alpert Foundation Prize Symposium in October.

Optogenetics, which involves genetically modifying neurons to express light-sensitive proteins originally isolated from algae, allows neuroscientists to control the activity of neurons with unprecedented power and precision, simply by exposing them to light.

"Taken together, these discoveries have fundamentally reshaped the landscape of modern neuroscience," said Harvard Medical School Dean George Q. Daley, AB '82, MD '91, PhD, in his welcoming remarks at the symposium.

"They have set the stage for optogenetics-based therapies that could, one day, be used to restore vision loss, preserve movement following spinal cord injury, or modulate circuits that fuel anxiety and depression, among many other applications," Daley said.

The Warren Alpert Foundation Prize, administered by the Warren Alpert Foundation and HMS, recognizes scientists whose research and achievements promise to revolutionize how we understand, diagnose, and treat disease. The 2019 winners were Edward Boyden, PhD, the Y. Eva Tan Professor in Neurotechnology at MIT; Karl Deisseroth, MD, PhD, the D.H. Chen Professor of Bioengineering and of Psychiatry and Behavioral Sciences at Stanford University; Peter Hegemann, PhD, the Hertie Professor for Neuroscience at Humboldt-Universität zu Berlin; and Gero Miesenböck, MD, the Waynflete Professor of Physiology at the University of Oxford.

LEARN MORE ABOUT THE PRIZE AND ITS PAST RECIPIENTS AT WARRENALPERT.ORG/PRIZE

FROM LEFT: JOSEPH MARTIN, DIRECTOR AND CHAIRMAN OF THE BOARD OF THE WARREN ALPERT FOUNDATION, AND AUGUST "GUS" SCHIESSER, THE FOUNDATION'S EXECUTIVE DIRECTOR, CONGRATULATE PETER HEGEMANN, ONE OF THE 2019 WARREN ALPERT FOUNDATION PRIZE WINNERS.

FUNDING INNOVATION IN AUTISM RESEARCH

The Simons Foundation exists to support basic—or discovery-driven—scientific research undertaken in the pursuit of understanding the world's phenomena.

The mission of the Simons Foundation Autism Research Initiative (SFARI) is to improve the understanding, diagnosis, and treatment of autism spectrum disorder (ASD) by funding innovative research of the highest quality and relevance. In pursuit of this mission, SFARI has supported the work of several Harvard Medical School faculty members over the past 10 years.

Jun Huh, PhD, assistant professor of immunology in the Blavatnik Institute at HMS, is one of those faculty members. He received his first SFARI grant, for more than $350,000, to undertake a project with Dan Littman, MD, PhD, a professor at the New York University School of Medicine. Together they studied the mechanisms by which prenatal exposure to an uncontrolled inflammatory environment leads to ASD-like phenotypes in mouse offspring.

Now, Huh has received a $1.3 million SFARI Research Award to pursue a related project. Huh's lab will use the same mouse model to study the modulatory roles of the maternal immune system in supporting fetal brain development. But the goals of the newly funded project differ from the earlier work.

"We want to identify human commensal bacteria and anti-inflammatory factors that can be used in pregnant mice to prevent the development of neurodevelopmental disorders in their offspring," Huh says.

He adds that without SFARI funding, his team could not have started this work. "I feel extremely grateful to the Simons Foundation for their continuing support of our work investigating a close interaction between the maternal immune system and the fetal brain," he says.

TO READ OUR Q&A ON AUTISM RESEARCH WITH MICHAEL GREENBERG, CHAIR OF THE DEPARTMENT OF NEUROBIOLOGY AT HMS, TURN TO PAGE 18.

Launched in 2003, SFARI is a scientific initiative within the foundation's suite of programs. It has provided or committed more than $525 million in external research support to more than 550 investigators in the U.S. and abroad. SFARI Research Awards support the investigation of key unresolved research questions in ASD, particularly those that connect genetic etiologies to brain function and behavior. SFARI intends to provide about $11 million in funding over the next four years to nine investigators—Huh being one of them—as part of its Research Award program.

THIS SCANNING ELECTRON MICROSCOPE IMAGE (COLOR ADJUSTED FOR PUBLICATION), COURTESY OF THE HUH LAB, SHOWS GUT-RESIDING BACTERIA THAT PROMOTE AUTISM-LIKE BEHAVIORS.

> "I FEEL EXTREMELY GRATEFUL TO THE SIMONS FOUNDATION FOR THEIR CONTINUING SUPPORT OF OUR WORK INVESTIGATING A CLOSE INTERACTION BETWEEN THE MATERNAL IMMUNE SYSTEM AND THE FETAL BRAIN."
>
> JUN HUH

"The work of SFARI-funded investigators has contributed tremendously to our understanding of autism biology, but there is still so much we have to learn," SFARI Director Louis Reichardt, AB '64, PhD, said at SFARI.org. "We hope these grants will not only further knowledge on the biological causes and molecular and neural mechanisms underlying ASD but also promote a better understanding of targets for potential treatment."

FINANCIAL AID AND EDUCATION

KEEPING THE MOMENTUM

Beverly G. Coleman, MD ’74, and Everod A. Coleman Jr., DMD ’73, MPH ’73, were among the first black students enrolled at Harvard Medical School and the Harvard School of Dental Medicine after the assassination of Martin Luther King Jr. in 1968. King’s murder led to the launch of the 1969 diversity initiative at HMS that paved the way for a culture of inclusion at the School and beyond.

In October, HMS and HSDM commemorated the 50th anniversary of this initiative with a full-day celebration (see opposite page) that drew hundreds of students, faculty, and staff from across the Harvard community, as well as alumni from around the country, including the Colemans.

“Harvard should be proud. The diversity initiative was an overwhelming success,” says Beverly Coleman. “We have esteemed alumni who are leaders in their fields, and everything that we accomplish is a reflection of the School.”

While she and Everod were not the first generation of college graduates in their families, neither of them could afford to attend without the scholarships they received. In an effort to pay it forward and create a lasting impact, they have established a REACH scholarship with a $250,000 gift. REACH provides funding through HMS’s need-based financial aid program to reduce the loan component of a student’s financial aid package, making it more feasible for those who are historically underrepresented in the medical profession to accept their offers of admission.

Fidencio Saldaña, MD ’01, MPH ’05, HMS dean for students and interim director of the Office of Recruitment and Multicultural Affairs, notes that the School continues to focus on recruiting and developing a diverse student body to ultimately provide the best care for the world’s diverse population. “Support from alumni like the Colemans is instrumental in achieving this goal,” he says.

“HMS TOOK A STAND FOR WHAT IS RIGHT, AND WE ARE EXTREMELY GRATEFUL.”

BEVERLY G. COLEMAN

The Colemans were thrilled to celebrate the diversity initiative’s anniversary and the progress made by HMS since, and they hope their gift continues that momentum by motivating others to help minority students reduce their debt.

“HMS took a stand for what is right, and we are extremely grateful. It’s important to us to be part of the history of Harvard so that future graduates know that we are rooting for them,” says Beverly Coleman.

FINANCIAL AID AND EDUCATION

AN ARDENT SUPPORTER OF FINANCIAL AID

With the approach of his 60th Reunion, Jordan Cohen, MD ’60, found himself reflecting on the enormous debt he says he owes to Harvard Medical School.

“Not only for the quality of the education I received, but also for the innumerable, lifelong friendships I made,” says Cohen, who serves on his class Reunion Committee. “My life has been enhanced immeasurably by having been an HMS graduate.”

“I WOULD ENCOURAGE ALL HMS ALUMNI TO DESIGNATE THEIR GIFTS TO FINANCIAL AID.”

JORDAN COHEN

To show his gratitude for HMS, Cohen, who is chair of the Ezekiel Hersey Council, HMS’s legacy society, has established the endowed Cohen Family Scholarship with a $250,000 gift in the form of a charitable remainder unitrust (CRUT). He says he chose this type of planned gift because it allows for growth over time to benefit HMS, while also providing him quarterly payments in his retirement. Cohen’s gift also addresses one of his long-standing concerns: medical student debt.

“Evidence confirms that fear of acquiring debt dissuades many deserving students—especially from disadvantaged backgrounds—from even considering medicine as a career,” says Cohen, a member of the HMS Board of Fellows and HMS Advisory Council on Education. “Moreover, anxiety about repaying accumulated debt influences many graduates to choose residencies in well-reimbursed specialties and to abandon their original intent to pursue a less remunerative—but for them, a more rewarding—professional life.”

Students in the HMS Class of 2019 graduated with an average medical debt of $111,823, which, while comparing favorably to the $184,892 national average at private medical schools, is an amount that Cohen says should “outrage” those in the medical profession.

“We have a unique responsibility, being their predecessors, to ease their transition to become our successors,” he says. “I would encourage all HMS alumni to designate their gifts to financial aid.”

CELEBRATING DIVERSITY & INCLUSION

In 1969, Harvard Medical School established a program to recruit 15 African American students. The initiative was prompted by a group of faculty members who were inspired by the civil rights movement and spurred by the assassination of Martin Luther King Jr. On Oct. 28, alumni from around the country, as well as faculty, staff, and students, gathered to celebrate 50 years of diversity and inclusion at HMS and Harvard School of Dental Medicine. The event included a symposium, panel discussion, music, personal reflections, a poignant original poem, and a touching tribute to Alvin Poussaint, MD, who retired last year after a half-century of service to HMS, most recently as director of the Office of Recruitment and Multicultural Affairs.

Nancy Oriol, MD '79, faculty associate dean for community engagement in medical education at HMS, spearheaded the planning efforts for the diversity celebration.

Mary Tate, MPH '17, MD '18, a resident physician in obstetrics and gynecology at McGaw Medical Center of Northwestern University, shares a laugh with Jason Outlaw, DMD '17, who created a commemorative stained glass art piece that was presented to the Office of Recruitment and Multicultural Affairs in honor of Alvin Poussaint, MD.

Joan Reede, MD, MPH '90, SM '92, MBA, dean for diversity and community partnership at HMS; Kevin Churchwell, MD (center), president and chief operating officer of Boston Children's Hospital; and Fidencio Saldaña, MD '01, MPH '05, dean for students at HMS, participate in a panel discussion.

"ALTHOUGH IT'S CLEAR WE HAVE MUCH MORE TO DO, IT'S ALSO CLEAR TO ME THAT WE HAVE A COMMUNITY THAT'S DEDICATED TO DOING IT."

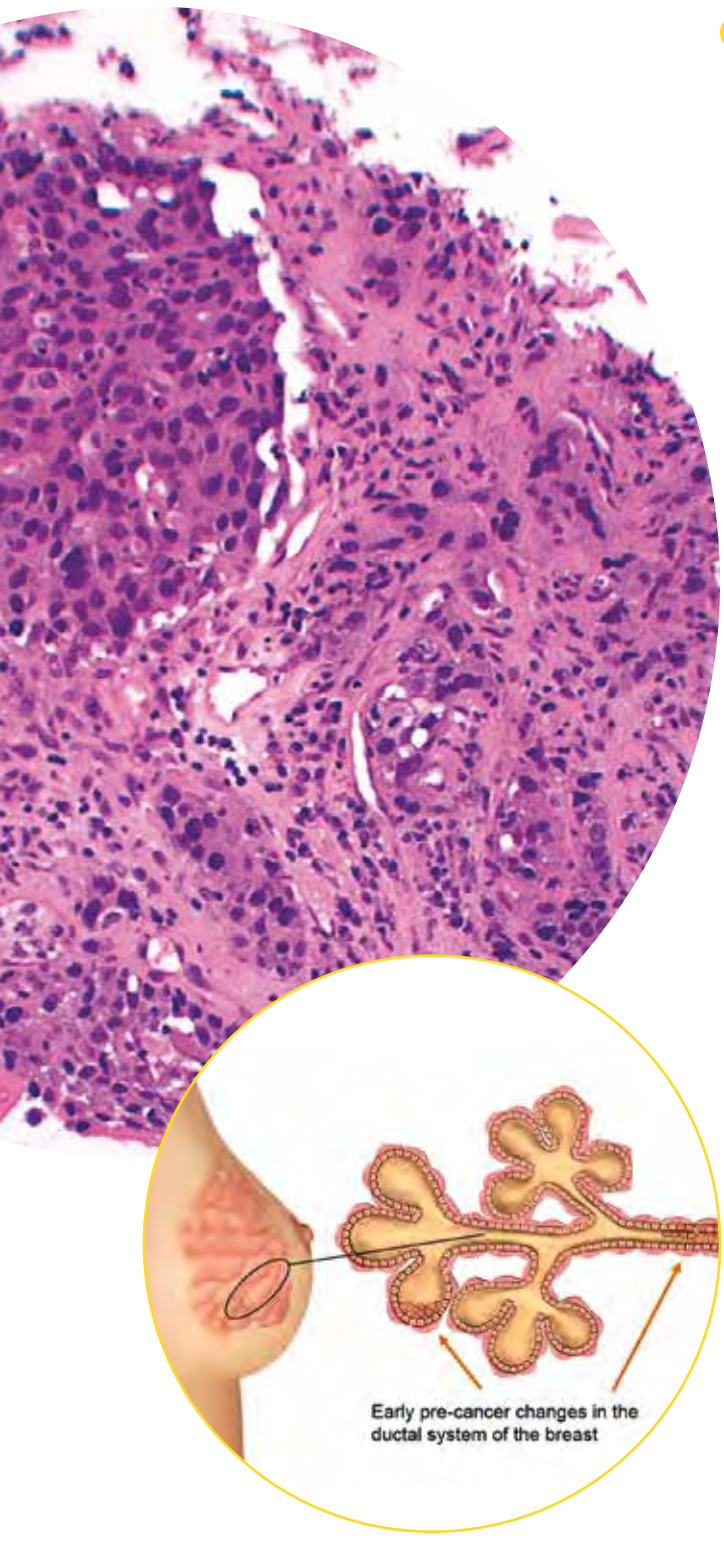
HMS DEAN GEORGE Q. DALEY, AB '82, MD '91, PHD

Watch videos from the 50th celebration at **tinyurl.com/diversity-50th**

Many alumni returned to HMS to honor Alvin Poussaint, MD (right), who was their mentor when they were students.

HMS and HSDM have graduated more than 1,350 students of color since the diversity initiative began.

CATALYZING COLLABORATIONS IN CANCER RESEARCH



THE IMAGE AT TOP SHOWS A SECTION THROUGH A BREAST TUMOR FROM A WOMAN CARRYING A BRCA1 MUTATION. THE ILLUSTRATION ABOVE SHOWS EARLY CHANGES IN BREAST EPITHELIAL CELLS THAT OCCUR PRIOR TO THE DEVELOPMENT OF A TUMOR.

IMAGE: DR. SUSAN LESTER, BRIGHAM AND WOMEN'S HOSPITAL
ILLUSTRATION: RACHEL DAVIDOWITZ

About 1 in 400 people in the U.S. carry mutations in the BRCA1 gene, the BRCA2 gene, or both—genetic variations that can dramatically increase their chances of developing breast, ovarian, prostate, or pancreatic cancers. Researchers have long known that these mutations boost cancer risk because they mute the DNA-repairing role of these genes. However, how the cells that carry these genetic variants evolve over time to spawn tumors is unclear, says Joan Brugge, PhD, the Louise Foote Pfeiffer Professor of Cell Biology in the Blavatnik Institute at Harvard Medical School and co-director of the Ludwig Center at Harvard.

"THROUGH SUPPORTING HARVARD AND OTHER GLOBAL TEAMS, WE EXPECT TEAM SCIENCE WILL PROVIDE AN UNPRECEDENTED ROAD MAP FOR PREVENTION, DIAGNOSIS, AND TREATMENT OF BRCA1/2-RELATED CANCERS."

JON AND MINDY GRAY

If researchers could identify and track these changes, they could precisely time double mastectomies—interventions that practically eliminate the risk of breast cancer in these women—or, eventually, develop strategies that interfere with these processes to stymie tumor progression.

With a $3 million grant from the Gray Foundation, Brugge and a team of colleagues from HMS, its affiliate hospitals, and other labs around the world will use various technologies to investigate the minute changes that take place within cells on the road from health to tumorigenesis. Many of these analytical technologies are part of a recent revolution allowing researchers to hone in on single cells, rather than ensembles of cells that make up larger tissues, Brugge says.

"We are delighted to support Dr. Brugge's team and change the paradigm of medical research by catalyzing collaborations that bring the brightest minds together to mitigate the burden of BRCA1/2 mutations," Gray Foundation founders Jon and Mindy Gray said in a statement. "Through supporting Harvard and other global teams, we expect team science will provide an unprecedented road map for prevention, diagnosis, and treatment of BRCA1/2-related cancers."

The HMS faculty members working with Brugge's lab are Jia-Ren Lin, PhD, a research associate in therapeutic science within the Harvard Program in Therapeutic Science at HMS; Judy Garber, MD, MPH, a professor of medicine at Dana-Farber Cancer Institute (DFCI); David Livingston, AB '61, MD, the Emil Frei Distinguished Professor of Medicine at DFCI; Deborah Dillon, MD, an assistant professor of pathology at Brigham and Women's Hospital (BWH); and Sandro Santagata, MD, PhD, an associate professor of pathology at BWH.

Within her own lab, Brugge is using three different approaches to examine cells sampled from a large number of women with BRCA 1 or BRCA 2 mutations. Using breast epithelium, the major structural component of breast tissue, she and her team are probing both RNA production (a readout of the gene expression) and the proteins produced in individual cells. In whole breast tissue, they are using antibodies to assess the spatial locations of single cells producing specific proteins.

After examining hundreds of thousands of individual cells, Brugge's team has identified two subtypes of cells that appear to accumulate in women with BRCA1/2 mutations. One of these subpopulations, known as "borderline" (BL) cells, carries a blend of markers from the major types of breast epithelial cells, suggesting that they have lost their differentiation "identity," a common property of tumor cells. The other subpopulation, known as LUM cells, appears to have reduced expression of several genes typically associated with breast epithelial cells known as mature luminal cells.

Brugge notes that the funding, which is part of the Gray Foundation's Team Science Grant Program, provides support for experts from multiple fields to work together to understand whether the cells that accumulate in the BRCA1/2 mutation carriers contribute to cancer development and whether their accumulation is specifically related to BRCA1/2 mutations.

"Standard grants fund individual labs, making it difficult to get full buy-in from collaborators because there's not enough support for everyone's research," Brugge says. "With this type of funding, everyone feels really good about coming to the table because there are enough resources to go around."

The Gray Foundation's two distinct missions are to help women with BRCA-related cancers and to improve the lives of low-income New York City youth.

PAYING TRIBUTE TO AN ILLUSTRIOUS CAREER

JACK STROMINGER (FRONT) IS HONORED AT A DINNER CELEBRATION BY (BACK ROW, FROM LEFT) STEPHEN CHUBB, GERALD CHAN, ARLENE SHARPE, AND TIMOTHY SPRINGER.

Legendary biochemist and immunologist Jack Strominger, AB '47, MD, calls the joy of discovery "amazing." He remembers vividly when and where he realized the essence of his most important findings. He also remembers the people who were with him.

"Science is not done alone," says Strominger, 94, making sure to offer the names of the key collaborators on his two biggest discoveries: how penicillin kills bacteria and how the immune system fundamentally works.

In this vein of collaboration, it's fitting that a lectureship recently established to honor Strominger, the Higgins Research Professor of Biochemistry in the Department of Stem Cell and Regenerative Biology (SCRB), will bring together immunologists and stem cell and regenerative biologists to share their work with faculty and students across Harvard.

Professor Jack Strominger has more than 30 awards to his name, including the Selman A. Waksman Award in Microbiology, the Albert Lasker Award for Basic Medical Research, and the Japan Prize (the latter two both shared with Don Wiley). Former members of his laboratory include 12 Harvard professors, 12 National Academy of Sciences members, and two Nobel laureates.

"Jack was one of the first faculty members to bridge the different scientific cultures of the Faculty of Arts and Sciences in Cambridge and Harvard Medical School in Boston, so it was important to honor him with a lectureship that bridges both campuses," says Timothy Springer, PhD '76, the Latham Family Professor of Biological Chemistry and Molecular Pharmacology at HMS and Boston Children's Hospital.

Springer, a Strominger mentee and friend who received the prestigious Canada Gairdner International Award in 2019, spearheaded the lectureship gift effort, helping to raise $600,000. Lead donors include Springer and two other Strominger friends: businessman Stephen Chubb and entrepreneur Gerald Chan, SM '75, SD '79.

The annual lecture debuted in January at HMS. It will be organized and hosted alternately each year by the Department of Immunology in the Blavatnik Institute at HMS—chaired by Arlene Sharpe, AB '75, AM '76, PhD '81, MD '82, who conducted undergraduate thesis research in Strominger's lab and, together with her husband, Gordon Freeman, AB '73, PhD '79, made a significant gift to the lectureship fund—and the Harvard Department of SCRB, which is chaired by Paola Arlotta, PhD, professor of SCRB, and co-chaired by Amy Wagers, PhD, the Forst Family Professor of SCRB.

Strominger, whose lab has been working on tolerance and immunity at the maternal-fetal interface, says it feels great to be recognized by his peers with an endowed lectureship that will be named for him upon his retirement.

"I am most proud of the subsequent success of the many undergraduates, graduate students, and postdoctoral fellows who have worked in my laboratory," says Strominger, who is regarded as a friend and mentor to numerous people whose lives he has touched.

DREAMS TAKE FLIGHT THANKS TO FINANCIAL AID

Students, alumni, and friends gathered Oct. 23 in Boston for the annual Spotlight on Medical Education event, which celebrates Harvard Medical School's students as well as the donors, volunteers, and leaders who have invested in teaching, learning, and financial aid at the School.

During his keynote address, former U.S. astronaut Robert L. Satcher Jr., MD '94, PhD (pictured), shared how his love of discovery and exploration took flight during his time in the Harvard-MIT Program in Health Sciences and Technology. It was this passion that led him to apply for the shuttle program at NASA and later become the first orthopedic surgeon to walk in space.

Current medical and graduate students also spoke at the celebration, describing their backgrounds, their unique journeys to medical school, and the essential role that their financial aid packages played in their ability to attend. HMS Dean for Medical Education Edward M. Hundert, MD '84, thanked event attendees for supporting students through financial aid, saying their contributions help create a living legacy. "The ripple effects are all the students they will teach, the patients they will care for, and the science they'll discover," he said.

FINANCIAL AID AND EDUCATION

INSPIRED HST ALUMNA BOLSTERS PROGRAM

A GIFT FROM HST ALUMNA CHRISTY DOSIOU AND HER HUSBAND, ANDREAS STAVROPOULOS, WILL ENABLE STUDENTS IN THE HST PROGRAM TO SPEND AN EXTRA YEAR PURSUING LEADING-EDGE RESEARCH.

The Harvard-MIT Program in Health Sciences and Technology (HST) brings together HMS, Harvard University, Harvard-affiliated teaching hospitals, MIT, and local research centers to integrate science, medicine, and engineering to solve problems in human health.

Chrysoula "Christy" Dosiou, AB '93, MD '97, says there was no single "aha moment" during her time as a student in the Harvard-MIT Program in Health Sciences and Technology (HST). That's because, she says, every day was an "aha moment," thanks in part to the fastidious devotion of her teachers.

Reminiscing about Farish Jenkins, PhD, the late anatomy professor who used colored chalks to draw 3D anatomical diagrams in exquisite detail, Dosiou says, "It was like going into a museum and seeing Michelangelo's original drawings." Pathology professor Richard Mitchell, MD '84, PhD, would find the most memorable ways to present organ anatomic pathology; for example, Dosiou recalls "spaghetti and meatballs" as being how the kidney was described microscopically. "To this day, if I see renal slides in a pathology presentation, I automatically recognize them." And Roger Mark, MD '65, during pathophysiology sessions on cardiovascular disease at MIT, would model the cardiovascular system after a resistor-capacitor (RC) circuit. "The MD students found this quite intimidating, but with the help of our engineering colleagues, we came to understand the pathophysiology of the cardiovascular system so deeply, that I'll never forget it," says Dosiou.

In her current role as endocrinology fellowship program director at Stanford University School of Medicine, Dosiou says she constantly draws on her HST experiences as models of optimal teaching, which she uses with her trainees every day. She says her HST teachers—along with her exceptional peers and incredible research opportunity at Dana-Farber Cancer Institute working toward developing immunotherapies for leukemia—helped to make the HST experience "the most intellectually stimulating time of my life." Now, she wants to show her appreciation for the program by giving back. Dosiou and her husband, Andreas Stavropoulos, AB '92, SM '92, MBA '97, recently donated $1 million to HMS to establish an endowed HST fifth-year research fellowship.

"With over 50 percent of the HST medical students participating in a fifth year of research, we felt this would be the best way to contribute to one of the core missions of the program: to cultivate leaders who will deeply explore the principles underlying disease and engage in innovation across disciplines," says Dosiou, who is also helping to plan the HST 50th anniversary celebration, which was scheduled for Nov. 6-7 but has been postponed because of the coronavirus pandemic.

CHRISTY DOSIOU CALLS HER HST EXPERIENCE "THE MOST INTELLECTUALLY STIMULATING TIME OF MY LIFE."

Wolfram Goessling, PhD, MD, a professor of medicine at HMS and Massachusetts General Hospital and co-director of the HST program, calls the gift truly essential and inspiring. "In patient care, our students are seeing many diseases for which we currently do not have the best approaches for diagnosis, prevention, and treatment. Rigorous training in basic research and engineering enables our HST students to find new answers for these unmet needs."

Dosiou, a clinical professor in endocrinology and the medical director of the Thyroid Eye Clinic at Stanford University School of Medicine, says her HST training helped her recognize that a multidisciplinary approach was needed to provide optimal care for her patients with thyroid eye disease, a condition with limited treatment options that is often quite debilitating.

"So I created, in collaboration with my ophthalmology colleagues, a multidisciplinary thyroid eye clinic," she says. "We review comprehensively all of a patient's clinical data and make joint decisions involving evaluation and treatment of both the endocrine and ophthalmologic manifestations of the disease. This approach results in both better clinical outcomes and improved quality of life for the patient. Also, when trainees rotate in our clinic, we are able to expose them to all aspects of the disease, which is the best way to educate future leaders in the field."

FINANCIAL AID AND EDUCATION, GLOBAL HEALTH AND SERVICE

COUPLE HOPE TO BE AGENTS FOR POSITIVE CHANGE

Kush Parmar, PhD '08, MD '10, and his wife, Padmaja Kumari Parmar, are passionate about making a difference in the world. Their two recent gifts to Harvard Medical School—$250,000 to establish the endowed Parmar HST Scholarship and $100,000 to create the current-use Friends of Mewar Fund in Global Mental Health—are the embodiment of that fervor.

"THE BURDEN OF MENTAL HEALTH ON PATIENTS AND THEIR FAMILIES GLOBALLY IS LESS VISIBLE IN HEADLINES BUT IS SILENTLY GIGANTIC."

PADMAJA KUMARI PARMAR

"We feel it is imperative to support students to give them more financial flexibility to follow their true interests and curiosities and to pursue research, a cornerstone for HST and also for effecting broad change in medicine," says Kush Parmar, an alumnus of HST—the Harvard-MIT Program in Health Sciences and Technology. "Global health is also of major personal interest, and we can find few areas in more dire need of support and attention than global mental health."

HMS Dean George Q. Daley, AB '82, MD '91, PhD, a fellow HST alumnus, praised the couple's devotion to the program. "This commitment is another exciting example of our alumni community coming together to support the HST program as we prepare to celebrate its 50th anniversary and look forward to the next half-century," says Daley, who has served on the HST faculty since 1995.

HST is a collaboration among HMS, MIT, Harvard University, and Harvard-affiliated teaching hospitals that integrates science, medicine, and engineering to solve problems in human health. The Parmars believe that this multidisciplinary approach to training physicians and scientists—the "HST way"—will equip the next generation of leaders to make a positive impact on the future of medicine. "Solutions to the biggest health care burdens globally will come from unprecedented synergies across several disciplines," Kush Parmar says.

Through their U.S.-based nonprofit, Friends of Mewar, the couple say they are honored to support the work of Vikram Patel, MBBS, MSc, PhD, the Pershing Square Professor of Global Health in the Blavatnik Institute at HMS. Specifically, their gift will support Patel's activities and research related to the GlobalMentalHealth@Harvard Initiative, a joint effort of HMS, the Harvard T.H. Chan School of Public Health, and the Harvard Global Health Institute that aims to transform global mental health through education, research, innovation, and engagement.

"The burden of mental health on patients and their families globally is less visible in headlines but is silently gigantic," Padmaja Parmar says. "We hope that with our gift, we can help catalyze influencers such as Dr. Patel and HMS in shining a light on this critical issue and pointing to impactful solutions."

KUSH AND PADMAJA PARMAR SAY THEY ARE PROUD TO SUPPORT VIKRAM PATEL (PICTURED) IN HIS WORK TO DEVELOP AND PROMOTE COMMUNITY INTERVENTIONS IN IMPOVERISHED AREAS FOR THE PREVENTION AND TREATMENT OF MENTAL HEALTH DISORDERS.

PROFESSORSHIP CELEBRATIONS

The following newly established Harvard Medical School professorships were recently celebrated, recognizing the generosity of their respective benefactors and the accomplishments of their inaugural incumbents.

KATZ SILVER FAMILY PROFESSORSHIP

Kevin Tabb (right), MD, president and chief executive officer of Beth Israel Lahey Health, chats with Robert W. Yeh, MD '03, MSc, MBA, during the celebration of the establishment of the Katz Silver Family Professorship of Outcomes Research in Cardiology and the installation of Yeh as the inaugural incumbent. Yeh is the director of the Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology at Beth Israel Deaconess Medical Center (BIDMC). The three donors whose generosity established the professorship are David Spina, MBA '72, his wife, Stevie, and Jennifer Silver, MBA, a BIDMC trustee.

J. STEPHEN BOHAN PROFESSORSHIP

In March, Michael J. VanRooyen, MD, MPH (left), chair of the Department of Emergency Medicine at Brigham and Women's Hospital (BWH), J. Stephen Bohan, SM '01, MD (center), former vice chair for clinical operations in the department, and Ron M. Walls, MD, a former chair of the department and the Neskey Family Professor of Emergency Medicine at BWH and Harvard Medical School, celebrated VanRooyen's installation as the inaugural J. Stephen Bohan Professor of Emergency Medicine at BWH and HMS. The professorship will be named for Walls upon his retirement.

CUTTING-EDGE RESEARCH

ADVANCING AUTISM TREATMENT

In 2012, the Nancy Lurie Marks Family Foundation hosted a scientific workshop for influential thinkers, hoping to stimulate a creative exchange of ideas that would enrich the field of autism research.

Mission accomplished. As a result of the workshop, the foundation funded a five-year collaborative project that has led to a better understanding of how the synaptic and behavioral functions of the striatum are critical to autism spectrum disorder. One of the three leaders of that project was Bernardo Sabatini, BS '91, MD '99, PhD '99, the Alice and Rodman W. Moorhead III Professor of Neurobiology in the Blavatnik Institute at Harvard Medical School.

"WE'RE HOPEFUL THAT HIS WORK CAN ILLUMINATE THE FUNDAMENTAL COMPLEXITY OF INTERCONNECTED NEURAL CIRCUITS THAT DRIVE AUTISTIC BEHAVIOR, ULTIMATELY BRINGING US CLOSER TO MORE EFFECTIVE THERAPIES FOR AUTISM."

JUDITH CHAN

Impressed by Sabatini's productive collaborations on that project—and by his significant contributions to neuroscience—the foundation recently awarded him a grant of more than $800,000 as part of a $2.3 million collaborative project. Sabatini's lab will work with the labs of Anne Takesian, PhD, and Daniel Polley, PhD, both of HMS-affiliated Massachusetts Eye and Ear, to examine the neural circuits by which normal sensory experiences lead to abnormal motor action—think of the hypersensitivity and repetitive motor actions of individuals with autism.

"We're hopeful that his work can illuminate the fundamental complexity of interconnected neural circuits that drive autistic behavior, ultimately bringing us closer to more effective therapies for autism," says Judith Chan, program officer and director of communications for the foundation, whose primary mission is to help people with autism lead fulfilling and rewarding lives. The foundation is committed to furthering research into the cause, cure, treatment, and prevention of autism and related conditions.

Sabatini says he appreciates that the foundation has been consistently willing to take risks on basic biological science with confidence that it will yield a greater understanding of how the brain generates behavior and eventually help treat individuals with autism.

"Unlike many disease-oriented foundations, they have been able to maintain the long-term view that studies of how circuits form and how cells change in brains of mice, and how these processes are altered by autism-associated genetic changes, will be of relevance to treating humans," he says.

Chan says the foundation's past collaborations with HMS have resulted in improved clinical care and a deeper understanding of the biology of autism.

"The Nancy Lurie Marks Family Foundation has seen firsthand the tremendous strides in autism research and treatment that can be brought about through partnerships with the world-class researchers and clinicians affiliated with Harvard," she says.

EHC SPOTLIGHT: CHRISTINA AND RALPH SWEETLAND

"Harvard Medical School has a record of identifying and developing talent, as well as taking some risks—as they did with me! I have no doubt that our bequest will continue this legacy for the benefit of future generations of physicians."

—Ralph Sweetland, AB '61, MD '66

The Ezekiel Hersey Council recognizes those who have created a life income gift, named HMS as a beneficiary of a retirement account or existing donor-advised fund, or included HMS in their will or trust. ***Learn more at hms.harvard.edu/EHC.***

CHRISTINA AND RALPH SWEETLAND

EZEKIEL HERSEY COUNCIL

BEQUEST GIFT EXPANDS SCHOLARSHIP FUND

Irene and Sidney B. Luria, MD '43, had always agreed that giving back to Harvard Medical School was a priority. Sidney cherished his memories of HMS and built a successful career as a cardiovascular surgeon thanks to the education he received.

"I WOULD NOT BE AT HARVARD WITHOUT FINANCIAL AID, WHICH HAS ALLOWED ME, A FIRST-GENERATION STUDENT FROM A LOW-INCOME FAMILY, TO WORRY LESS ABOUT FUNDING MY MEDICAL EDUCATION AND MORE ABOUT LARGER SOCIETAL ISSUES LIKE HEALTH ACCESS, HOMELESSNESS, AND IMMIGRATION REFORM."

DAVID VELASQUEZ

After Sidney died in 2010, his wife decided to honor his allegiance to the School by establishing a $1 million charitable gift annuity (CGA) to endow the Dr. Sidney B. Luria and Irene F. Luria Scholarship Fund at HMS. She said she designated her gift to scholarship to ensure that talented students could have the opportunity to attend HMS regardless of their income level. "Harvard Medical School is the best, and it's a privilege for anyone to be able to continue their education there," Irene said upon making the gift.

Sadly, Irene died in early 2019, but her and Sidney's legacy lives on at HMS. The Sidney Luria Revocable Trust recently bequeathed $3.35 million to the School, with $2.85 million supporting the scholarship fund and the remaining $500,000 establishing the Dr. Sidney B. Luria Fellowship Fund for Cardiovascular Disease at HMS. The latter fund will provide a traveling fellowship to a graduate student fellow or postdoctoral fellow at HMS whose research focuses on cardiovascular disease.

David Velasquez, HMS Class of 2021, is the first beneficiary of the scholarship fund. He says he is "beyond grateful" for the support, which gives him the freedom to pursue his mission of making the world a more just and equitable place.

"I would not be at Harvard without financial aid, which has allowed me, a first-generation student from a low-income family, to worry less about funding my medical education and more about larger societal issues like health access, homelessness, and immigration reform," Velasquez says.

He says he hopes to work as an emergency medicine doctor, treating patients on the front lines while also advocating for them on a systemic level. "I hope to address their underlying causes of illness through pragmatic, policy-driven proposals and the implementation of robust programs that work with local and federal groups focused on social determinants of health," Velasquez says.

After serving in the military, Sidney Luria would eventually become chief of surgery at the Manchester (New Hampshire) VA Medical Center. He ultimately opened his own practice in Waterbury, Connecticut, where he was one of the only board-certified cardiothoracic surgeons in the country.

HMS STUDENT DAVID VELASQUEZ SAYS GROWING UP AROUND FAMILY AND FRIENDS WITHOUT ACCESS TO HEALTH CARE SPURRED HIS INITIAL DESIRE TO PURSUE A CAREER IN MEDICINE.

Sidney Luria served as an Army medical captain in the 24th Infantry Division in the Pacific during World War II and was awarded a Purple Heart and a Silver Star for treating 262 wounded soldiers in five days with no fatalities.

Q&A WITH MICHAEL GREENBERG

We sat down with Michael Greenberg, PhD, the Nathan Marsh Pusey Professor and chair of the Department of Neurobiology in the Blavatnik Institute at HMS, to talk about autism research, which is a theme of this issue of Pulse.

01

What are the biggest challenges that autism researchers are facing?

A major challenge in autism research is reconciling the complex interaction between the genetic factors that cause autism and the role of the environment and experience. We have known for many years that each of these has a powerful influence on brain development, but we are only beginning to understand how the interplay between so-called "nature" and "nurture" ultimately occurs at the cellular level to shape brain circuits and behavior.

02

Where is the highest potential for a breakthrough in this field?

I am convinced that through interdisciplinary collaboration, it will be possible to grasp the fundamental biology of autism. Through the Hock E. Tan and K. Lisa Yang Center for Autism Research, we are deeply motivated to leverage the expertise of scientists across the fields of neurobiology, genetics, and immunology, along with insights from the clinic, to dive deeper into understanding the mechanisms that ultimately cause autism.

03

How are recent advances in technology accelerating autism research?

Thanks to achievements in behavioral analysis and imaging approaches developed in our department, we can monitor the activity of defined brain circuits as an animal naturally behaves in real time. This breakthrough brings us one step closer to answering a fundamental question in autism research: How do differences in the development of brain circuits ultimately affect the function of these circuits and the behavior of an individual?

FINANCIAL AID AND EDUCATION

TURNING TRAGEDY INTO HOPE

In the spring of 1982, Harvard Medical School student Robert Lee Ely, AB '75, traveled to Gabon, a country on the west coast of Africa, to work in the Albert Schweitzer Hospital. A few weeks later, he was dead, having drowned in a swimming accident.

In honor of Ely, the Schweitzer Hospital renamed its pediatric clinics the Bob Ely Pediatric Clinics, while Ely's parents established the Robert Lee Ely Memorial Revolving Loan Fund to aid HMS students.

The loan fund evolved into the Robert Lee Ely Memorial Scholarship, established to remember Ely and his mother, Lucilla C. La Voy, who died in 2016. This endowed scholarship fund was recently expanded following a $250,000 bequest from Ely's stepfather and La Voy's husband, Kenneth R. La Voy Jr., LLB '50, who died in 2019.

"Testamentary gifts like this are a perfect expression of a legacy that will transform lives for generations to come," says HMS Dean for Medical Education Edward M. Hundert, MD '84.

Hundert says he had the pleasure of traveling to Florida to meet Kenneth La Voy, who was a founding member of the Harvard Law School Association of Europe and a decades-long corporate partner at a prestigious New York City law firm.

"TESTAMENTARY GIFTS LIKE THIS ARE A PERFECT EXPRESSION OF A LEGACY THAT WILL TRANSFORM LIVES FOR GENERATIONS TO COME."

EDWARD M. HUNDERT

"In honoring his stepson, Mr. La Voy channels a tragedy into a gift that will make it possible for future students to get an HMS education in perpetuity. He is a true inspiration for all of us," Hundert says.

VIRTUAL MATCH DAY

Graduating medical students joined more than 300 faculty, staff, family, and friends on a March 20 videoconference to celebrate HMS Match Day, which went virtual due to the coronavirus pandemic. Read the full story and see more photos at **tinyurl.com/hms-virtual-match**.

CALENDAR: PLEASE NOTE THAT WE HAVE REMOVED THE CALENDAR SECTION FROM THIS ISSUE OF PULSE DUE TO THE IMPACT OF THE CORONAVIRUS PANDEMIC ON UPCOMING EVENTS. THE CALENDAR WILL RETURN IN THE FALL ISSUE.

IN BRIEF

The following faculty-generated grants totaling $250,000 or more were awarded by organizations to support members of the Harvard Medical School community in their work to alleviate suffering and improve health and well-being for all.

The **Burroughs Wellcome Fund** has awarded $500,000 to Jeffrey Markowitz, PhD, a research fellow in neurobiology in the Blavatnik Institute at HMS, who is trying to resolve the neural mechanisms of reinforcement learning through new behavioral and optical technologies.

The **David and Lucile Packard Foundation** has awarded $875,000 to Sichen Shao, PhD, an assistant professor of cell biology in the Blavatnik Institute at HMS, to catalyze her lab's efforts to understand in molecular detail how cells recognize and handle aberrant protein synthesis complexes.

The **Massachusetts Life Sciences Center** is supporting Marcia Haigis, PhD, a professor of cell biology in the Blavatnik Institute at HMS, with a $750,000 grant to integrate metabolomics and big data to improve cancer therapy. As part of this project, **Agilent Technologies** will provide an additional $240,000 to fund a postdoctoral fellow in Haigis' lab.

The **Life Sciences Research Foundation** has awarded more than $550,000 to three researchers in the Blavatnik Institute at HMS. Lior Artzi, PhD, a research fellow in microbiology, is working to unravel the molecular mechanism and signal transduction of bacterial spore germination. Jonathan Green, PhD, a research fellow in neurobiology, is developing scalable methods for investigating the roles of cortical cell types in decision-making. Kiran Kurmi, PhD, a research fellow in cell biology, is studying nitrogen metabolism in cancer cells and its role in anti-tumor immunity.

Aetna Life & Casualty Company has given $500,000 to continue its support of the Aetna Research Collaboration under the direction of Isaac Kohane, MD, PhD, the Marion V. Nelson Professor and chair of the Department of Biomedical Informatics in the Blavatnik Institute at HMS. Established in 2011, the collaboration aims to analyze health care data in new ways to further clinical research and improve the quality and affordability of health care.

Jennifer Rosenbluth, MD, PhD, an HMS instructor in medicine at Dana-Farber Cancer Institute, has received a $450,000 grant from **Susan G. Komen**. Working in the Brugge Lab in the Blavatnik Institute at HMS, Rosenbluth is targeting inflammatory breast cancer (IBC) by using a new technique for growing tumors to generate cultures of IBCs, termed patient-derived organoids, for testing novel therapies.

The **American Federation for Aging Research** has awarded $418,500 in support to two scientists in the Blavatnik Institute at HMS. Alice Kane, PhD, a research fellow in genetics, is developing a predictive health span and life span clock for mice, in order to accelerate preclinical studies. Norbert Perrimon, PhD, the James Stillman Professor of Developmental Biology, is using drosophila to identify conserved molecules involved in organ communication and understand the role of these molecules in physiology and aging.

Richard Frank, PhD, the Margaret T. Morris Professor of Health Care Policy in the Blavatnik Institute at HMS, has received nearly $400,000 from the **Laura and John Arnold Foundation** to organize a compendium of opioid epidemic abatement actions based on evidence about their clinical and cost impacts. It will also include information on the ability to scale and implement the interventions. The goal is to inform the constrained choices that state and local governments may soon be facing in applying settlement funds in efforts to address the epidemic.

Tim Layton, PhD, an assistant professor of health care policy in the Blavatnik Institute at HMS, was awarded nearly $400,000 from the **Abdul Latif Jameel Poverty Action Lab (J-PAL)** to study the causal impact of work requirements in modern public assistance programs. J-PAL is a global research center working to reduce poverty by ensuring that policy is informed by scientific evidence.

The Pew Charitable Trusts is supporting the work of Alan Brown, PhD, an assistant professor of biological chemistry and molecular pharmacology in the Blavatnik Institute at HMS, with a $300,000 grant. Brown aims to understand the spatial organization of cilium-dependent signal-transduction pathways using visual phototransduction in photoreceptor neurons as a model system. His work could be a first step toward developing therapies that target ciliopathies.

The **Breast Cancer Research Foundation** has given $250,000 to continue its support of Joan Brugge, PhD, the Louise Foote Pfeiffer Professor of Cell Biology in the Blavatnik Institute at HMS and co-director of the Ludwig Center at Harvard. The grant supports studies in Brugge's lab to identify how the diverse cell types within an individual tumor respond to drugs, with the hope that more effective treatments can be developed to prevent drug resistance and metastasis in patients diagnosed with triple-negative breast cancer.

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HMS RESEARCHERS ASSIST GLOBAL EFFORT TO MAP THE HUMAN BODY, CELL BY CELL

04

CELEBRATING THE HEART AND IMPACT OF THE HMS COMMUNITY

PULSE

SPRING 20

‘THE VERY HEART OF OUR MISSION’

HMS Dean George Q. Daley, AB ’82, MD ’91, PhD, has convened a new consortium that aims not only to address the acute, most pressing challenges of coronavirus disease 2019 (COVID-19) but also to establish a framework for addressing future outbreaks. “Harnessing our science to tackle global health challenges is at the very heart of our mission as an institution dedicated to improving human health and well-being worldwide,” Daley says. **Read more about the consortium on Page 3 and get the latest COVID-19 insights from the HMS community at tinyurl.com/hms-coronavirus-response.**

HMS DEAN GEORGE Q. DALEY LEADS A MARCH MEETING TO ADDRESS THE COVID-19 PANDEMIC.