THE UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE
ANNUAL REPORT
2021

Reimagine

UNIVERSITY OF PITTSBURGH
SCHOOL OF MEDICINE
ANNUAL REPORT 2021

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Reimagine

Some may say a years-long pandemic presents reason enough to reimagine priorities at a medical school. Yet the necessity to change medicine as we know it was a priority for me at Pitt Med before anyone ever uttered the words "the novel coronavirus."

Modern medicine is, at once, miraculous and deeply flawed. It has extended our lifespans, yet it's mired in bottlenecks, siloed, expensive and leaves many people behind.

It's also capable of changing. Consider how the COVID-19 pandemic shined a spotlight on and radically disrupted the glacial pace of taking laboratory discoveries to patients and products. Something instructive happened: Scientists and clinicians throughout the world, including leading researchers from Pitt, worked to bring evidence-based COVID-19 treatments and vaccines to people at an astonishing pace.

And now in Pittsburgh, we are laying the foundation to further reinvent and reimagine health care — and the very idea of what an academic medical center can and should do.

This reinvention demands that our discovery efforts become more integrated with clinical care while our learning environments become more interprofessional and more inclusive. We will tackle the historically neglected but critically important questions, and in doing so we will challenge convention. Already, Pitt Med people are challenging currently accepted paradigms: about molecular biology, about whether a blind person will ever see again, about who guides research on communities, about how we teach and learn.

I would like to affirm that among Pitt Med faculty, staff, students and community partners, the determination to effect real change is unstoppable. And their creativity, as you see in this report, is bringing forth dramatic new possibilities for health and wellness.

I invite you to read on to learn more about some of the exciting work under way here at the University of Pittsburgh School of Medicine — and to join us as we build the brightest futures, as we reimagine how to heal our world.

Anantha Shekhar, MD, PhD
Senior Vice Chancellor for the Health Sciences
John and Gertrude Petersen Dean, School of Medicine

Their determination is palpable:

"WE WILL TACKLE PROBLEMS THAT OTHERS DON'T."

—José-Alain Sahel,
an MD, Distinguished Professor and chair of ophthalmology, on the plans for a new specialty hospital and research program on eye diseases

"IT'S AUDACIOUS, BUT IT'S TOTALLY DOABLE."

—Elizabeth Miller,
an MD, PhD and the Edmund R. McCluskey Professor of Pediatric Medical Education, on The Pittsburgh Study (a massive community partnership aiming to enhance the lives of Pittsburgh children)

Pitt Med people see possibility.

"WE WERE THE CITY THAT BUILT THE WORLD. NOW PITTSBURGH CAN BE THE CITY THAT HEALS THE WORLD."

CHANCELLOR PATRICK GALLAGHER

ECONOMIC GROWTH

Blossoms from Brownfields

STAGE FOR A NEW PITTSBURGH ECONOMY

Pitt will help fill a vital missing link in the region's economy.

A $100 million grant from the Richard King Mellon Foundation will support building a highly specialized biomanufacturing facility on an old mill site and brownfield in Pittsburgh's Hazelwood neighborhood. Called Pitt BioForge, the facility will leverage the biomedical and clinical expertise at Pitt and UPMC. The project design will also increase economic opportunities for residents in and around Hazelwood.

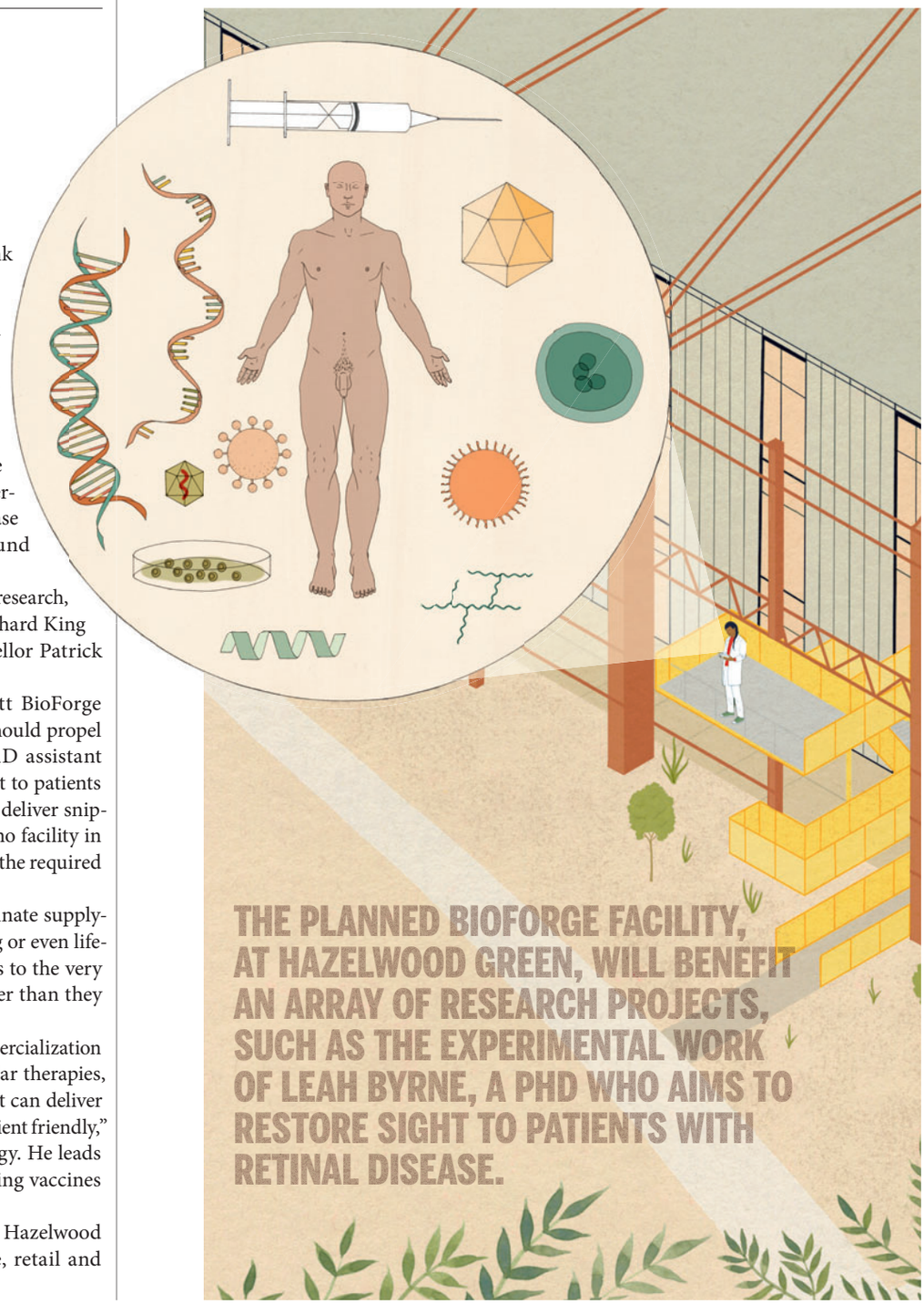
"The University of Pittsburgh is a leader in biomedical research, but we could not have made this leap without the Richard King Mellon Foundation's transformational gift," Chancellor Patrick Gallagher says.

The planned 200,000 to 250,000-square-foot Pitt BioForge facility will benefit an array of research projects. It should propel forward the experimental work of Leah Byrne, PhD assistant professor of ophthalmology, who aims to restore sight to patients with retinal disease. She uses engineered viruses that deliver snippets of DNA directly to cells in the retina. Currently, no facility in Pittsburgh, and only a select few worldwide, can create the required tools at the scale she needs.

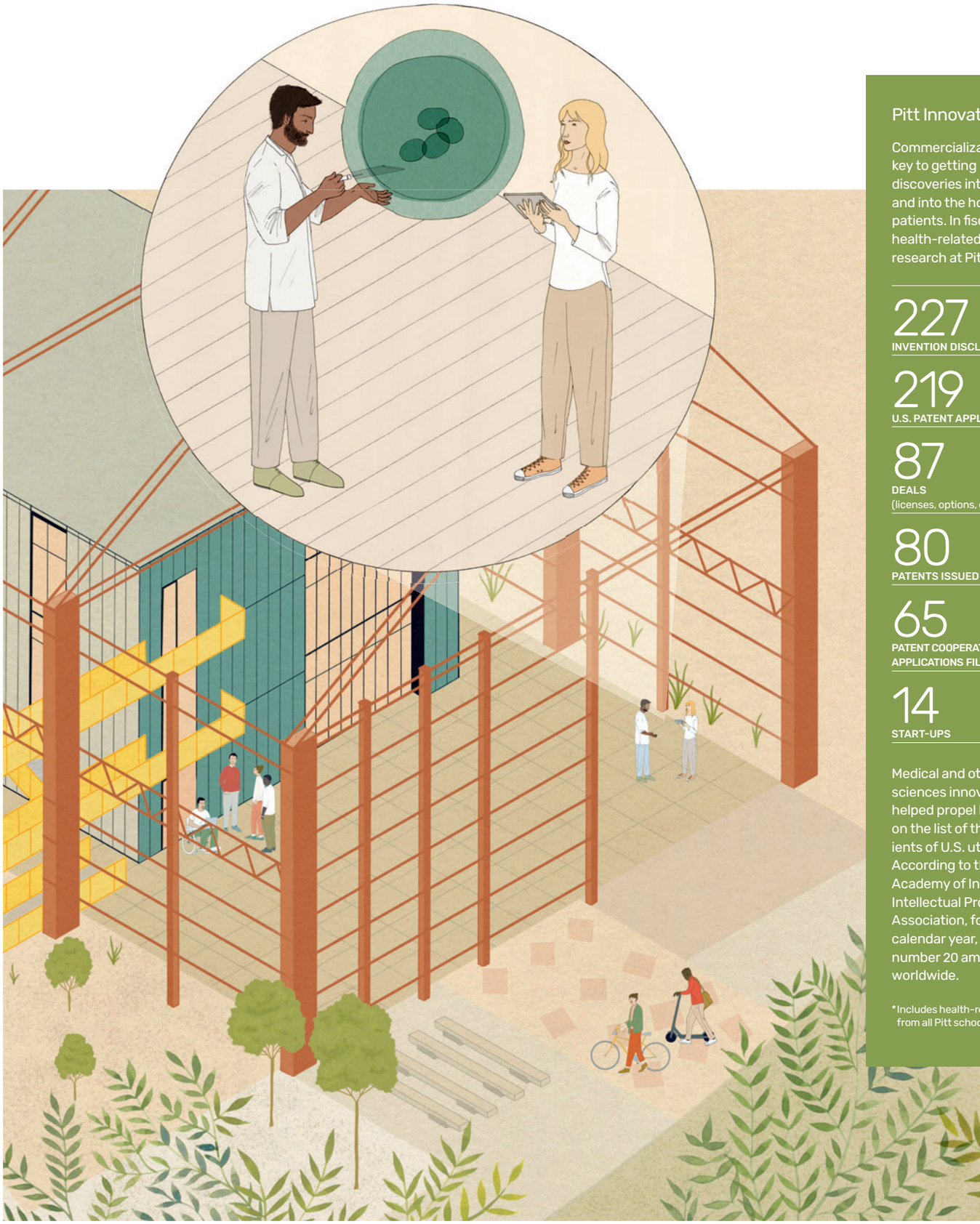
Bringing biomanufacturing to the city helps eliminate supply-chain hurdles. One upshot, which will be life-changing or even life-saving for some, is that Pittsburghers will have access to the very latest therapies — and those should be available sooner than they typically are now.

"This type of facility would broadly facilitate the commercialization of novel technologies and drugs, including new cellular therapies, antigens for vaccine development and new devices that can deliver therapies in a manner that is more effective, safe and patient friendly," says Louis Falo, an MD, PhD and chair of dermatology. He leads a team pioneering microneedle arrays for administering vaccines and other therapies.

BioForge will be an anchor facility at the 178-acre Hazelwood Green, which is being developed as a mix of office, retail and community space.



THE PLANNED BIOFORGE FACILITY, AT HAZELWOOD GREEN, WILL BENEFIT AN ARRAY OF RESEARCH PROJECTS, SUCH AS THE EXPERIMENTAL WORK OF LEAH BYRNE, A PHD WHO AIMS TO RESTORE SIGHT TO PATIENTS WITH RETINAL DISEASE.



Pitt Innovation*

Commercialization is key to getting promising discoveries into the clinic and into the homes of patients. In fiscal year 2021, health-related faculty research at Pitt resulted in:

227
INVENTION DISCLOSURES

219
U.S. PATENT APPLICATIONS FILED

87
DEALS
(licenses, options, other agreements)

80
PATENTS ISSUED

65
PATENT COOPERATION TREATY APPLICATIONS FILED

14
START-UPS

Medical and other health sciences innovations here helped propel Pitt's standing on the list of the top recipients of U.S. utility patents. According to the National Academy of Inventors and the Intellectual Property Owners Association, for the 2020 calendar year, Pitt ranked number 20 among universities worldwide.

*Includes health-related research from all Pitt schools

FDA Partners

As the world population of older adults continues to grow, the number of people with visual impairment is expected to triple by the year 2050.

Pitt is formally collaborating with the U.S. Food and Drug Administration to address the needs of the visually impaired. Under the agreement, Pitt and the FDA will work together for five years on scientific, educational and outreach initiatives designed to address the epidemic of vision loss.

"This will put Pitt in a position where we can work with the FDA on the validation of new technological approaches by developing programs and protocols," says José-Alain Sahel, Pitt's Eye and Ear Foundation Professor and ophthalmology chair. "Patients' voices will nurture our projects and define the successes we all want to deliver."

"We appreciate this phenomenal opportunity to partner with the University of Pittsburgh. Developing new methods to assess visual impairment and the impact on daily activities is important to helping the FDA better characterize the consequences of vision loss and also helping the FDA to reliably assess the benefit of novel therapies and rehabilitation technologies," says Malvina Eydelman, director of the Office of Ophthalmic, Anesthesia, Respiratory, ENT and Dental Devices in the FDA's Center for Devices and Radiological Health.

Hillman Foundation Vision for $25 Million

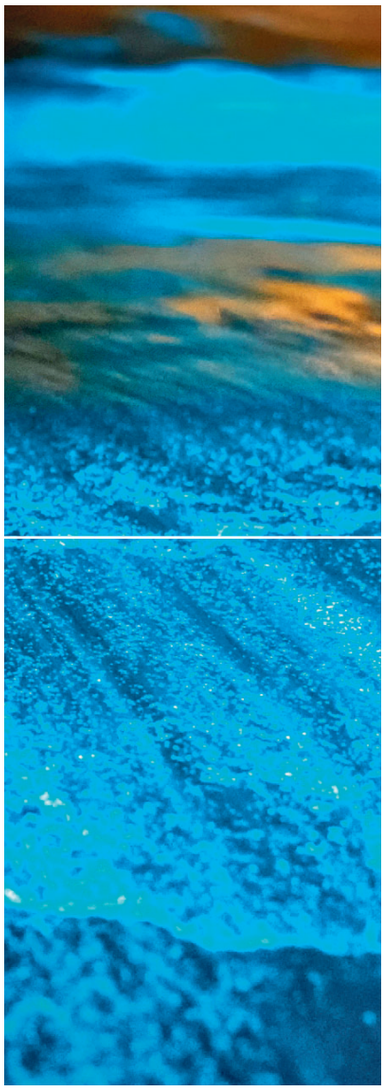
The Henry L. Hillman Foundation has committed $25 million to the University of Pittsburgh to support research into vision restoration and care, in addition to supporting the region's burgeoning life sciences sector.

Says José-Alain Sahel, an MD and chair of ophthalmology: "We will tackle problems that others don't, especially around access for all to the most innovative care and patient experience. The approach is to continue to attract the talent to expand a critical mass of scientists and clinicians working together."

The Hillman funding will help assure that vision care services are available to the city's underserved populations, Sahel notes, including outreach to underserved communities and facilitation of coverage for all. It also includes $3 million to support the growth of LifeX, the region's premier life sciences accelerator.

"WE WILL TACKLE PROBLEMS THAT OTHERS DON'T, ESPECIALLY AROUND ACCESS FOR ALL TO THE MOST INNOVATIVE CARE AND PATIENT EXPERIENCE."

JOSÉ-ALAIN SAHEL, CHAIR OF OPHTHALMOLOGY



"I'M HOPING THIS MIGHT MAKE A CONTRIBUTION TO FUTURE DEVELOPMENTS THAT WILL WORK EVEN BETTER."

ANONYMOUS PATIENT

TRANSLATIONAL RESEARCH

Breakthrough on Blindness

A STUDY PARTICIPANT'S PERSPECTIVE

Roger St. John (not his real name) was diagnosed with retinitis pigmentosa (RP) in his early 30s. Now in his 70s and blind, he gladly signed up when a University of Pittsburgh/UPMC research team called to invite him to participate in a new vision restoration study several months ago.

He then learned about the clinical trial from a New York Times report. In that trial, an international team of researchers, led by Pitt's José-Alain Sahel, chair of ophthalmology, and Botond Roska, of Basel (Switzerland), partially restored vision to a blind man in Paris. St. John then read other articles about where his next adventure would take him: into an emerging field called optogenetics. Optogenetic tools are inspired by nature — using engineered proteins that glow like those in bioluminescent algae. The research team was able to use these tools therapeutically to restore vision.

St. John's adventure started with a shot in the eye, he says — but no worries. There was an effective numbing agent involved. He chuckles, saying, "They asked my wife if she wanted to come and observe, and she declined."

This complex technology, more than a decade in development, is now in use with its first handful of study participants, including St. John and other Pittsburgh volunteers. Here's a quick explanation of how it works:

In RP, the photoreceptor cells (called rods and cones) are completely destroyed. The experimental injection uses a harmless virus to deliver specially engineered genetic material directly to the ganglions, a smaller group of cells that are still alive and kicking and attached to the optic nerve. And in turn, St. John says, "that genetic material prompts the ganglion cells to start producing a protein that is light sensitive. … Then, [the ganglions] can respond to patterns that appear on the retina."

The effects are subtle, though, which is where the gadget part comes in. A special set of glasses equipped with both a camera and a projection system amplify light for these repurposed ganglion cells.

It takes a couple of weeks for the virus to attach to the cells, and several weeks longer for the protein-production to get up and running, he explains.

And then over a period of months, the brain must learn to see anew with this wildly innovative workaround.

The results are likely to be pretty low-res. But that's okay with St. John.

"I'm hoping this might make a contribution to future developments that will work even better," he says. Then later adds: "I'm not doing it because there's some deficiency in my life experience. I'm doing it because I want to help."

By the Numbers

The School of Medicine continues to be a top recipient of federal research funds. Total National Institutes of Health funding to the University of Pittsburgh School of Medicine in fiscal year 2020 was more than

$442 million*

2020 NIH FUNDING RANKINGS, PITT MED DEPARTMENTS:

Physical Medicine: **2nd**

Psychiatry: **2nd**

Otolaryngology: **3rd**

Surgery: **5th**

Pharmacology: **6th**

Urology: **7th**

Anatomy/Cell Biology: **8th**

Internal Medicine: **8th**

Source for department data: BRIMR

*This number does not include almost $99.5 million of NIH WARP Speed funding subawarded to the University of Pittsburgh as the Administrative Coordinating Center for ACTIV Integration of Host-targeting Therapies for COVID-19.

> **A SLOAN RESEARCH FELLOW IS A RISING STAR, PLAIN AND SIMPLE."**
> ADAM F. FALK, FOUNDATION PRESIDENT

DISCOVERY

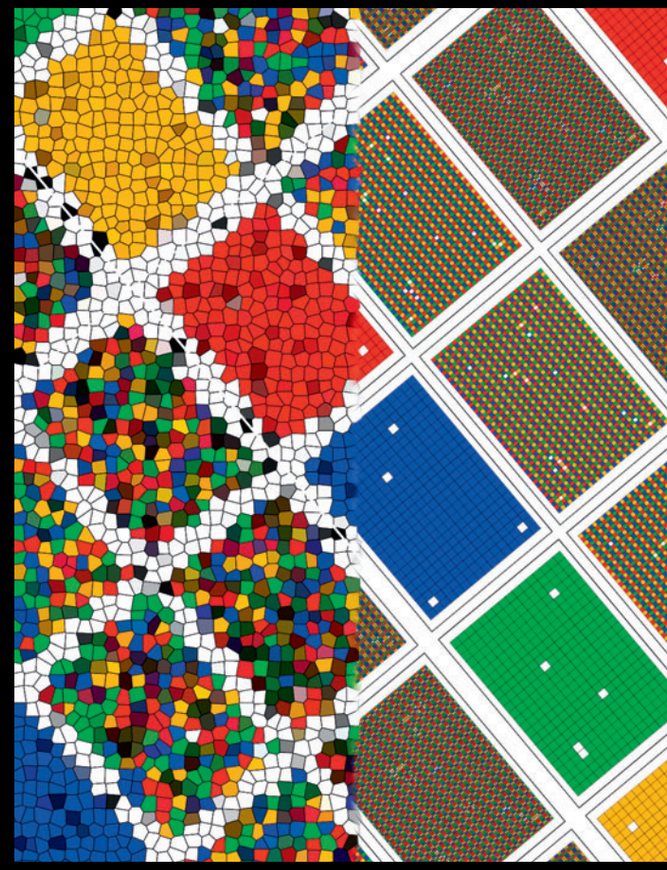
Biologist Nabs Both Sloan and NIH Director's Awards

Anne-Ruxandra Carvunis, a PhD assistant professor of computational and systems biology, is among 128 early career researchers receiving a 2021 Sloan Research Fellowship from the Alfred P. Sloan Foundation.

"A Sloan Research Fellow is a rising star, plain and simple," said foundation President Adam F. Falk. "To receive a fellowship is to be told by the scientific community that your achievements as a young scholar are already driving the research frontier."

A Sloan Fellowship offers investigators $75,000 over two years. Carvunis takes on "ambitious and risky evolution projects," including examining the principles that underlie change and innovation in living systems. Her work advances our understanding of the molecular mechanisms that make each species unique, including the origins of new species-specific genes.

Carvunis was also recognized with a National Institutes of Health Director's New Innovator Award.



Cool Tools

Anne-Ruxandra Carvunis was among the first investigators to demonstrate that genes can be created from scratch (or from noncoding DNA). In other words, junk DNA is not so junky. As her lab interrogates these big ideas, team members develop new computational and experimental tools—like high-throughput high-precision phenotyping of mutant yeasts expressing new genes—to answer the biological questions raised by her discoveries.

Shown here: A rendition, created by lab member Saurin Parikh, of the Carvunis team's high-throughput phenotyping plate. An experimental setup allows the researchers to examine multiple squares (microbial colonies within microbial colonies) on single agar culture plates (rectangles) at the same time.

"DOING THE TASK WHILE RECEIVING THE STIMULATION JUST WENT TOGETHER LIKE PB&J."

NATHAN COPELAND

REHABILITATION

Paralyzed Man Experiences Touch

ADVANCEMENT IN SENSORY STIMULATION

If you want to pick up a warm mug of coffee, and not have any of it end up in your lap, it helps to have full sensory and motor control over your arms and hands. When your motor and sensory systems work together, you can feel the weight and temperature of the mug and adjust your grip accordingly.

Tasks like that become much more difficult when a person relies on a prosthetic arm.

University of Pittsburgh bioengineers from Pitt's Rehab Neural Engineering Labs have found that adding brain stimulation that evokes tactile sensations makes it easier for an operator to manipulate a brain-controlled robotic arm. Their results were published in Science in May 2021 and made headlines. Pitt's Jennifer Collinger and Robert Gaunt were senior authors on the study.

Both are associate professors of physical medicine and rehabilitation.

Nathan Copeland volunteered for the study. Copeland has limited use of his arms and no use of his legs after a car crash. The crash also left him with limited feeling in his arms and hands.

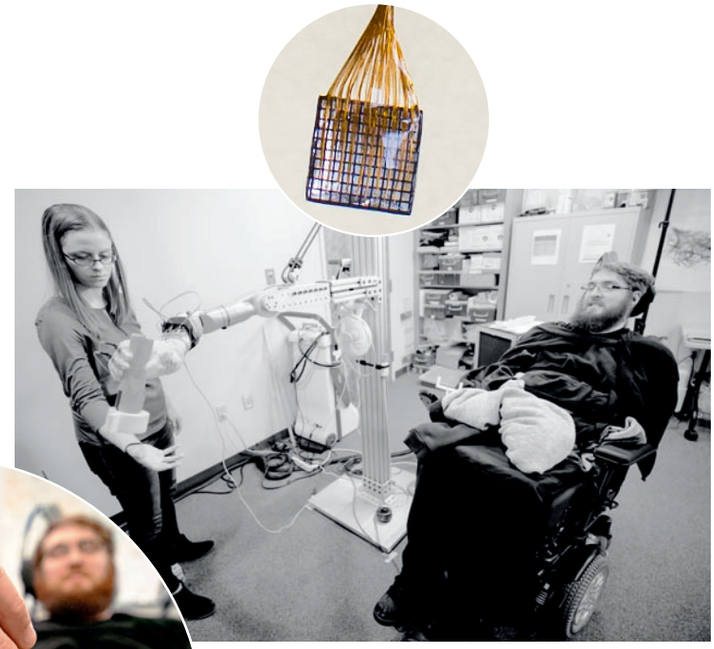
After the researchers supplemented Copeland's vision with artificial tactile perception, he was able to cut the time spent grasping and transferring objects in half, from a median time of 20.9 to 10.2 seconds.

This paper is a step forward from a 2016 study on sensation for which Copeland also volunteered. That paper described how stimulating sensory regions of the brain with tiny electrical pulses evoked sensation in distinct regions of his hand.

In this new study, Gaunt and Collinger's team was able to offer sensory feedback to the robotic arm.

"Doing the task while receiving the stimulation just went together like PB&J," says Copeland.

Gaunt says: "We still have a long way to go in terms of making the sensations more realistic and bringing this technology to people's homes, but the closer we can get to recreating the normal inputs to the brain, the better off we will be."



The study participant had tiny electrode arrays implanted not just in his brain's motor cortex but also in his somatosensory cortex—a region of the brain that processes sensory information from the body. The arrays allowed him to control the robotic arm with his mind as well as to receive tactile sensory feedback.

Diwakar Davar, MD

Hassane Zarour, MD

"WE ALWAYS BELIEVED THE SIGNAL WAS THERE, BUT WE DID NOT THINK THAT A SINGLE FMT TRANSFER WOULD HAVE PRODUCED SUCH DURABLE RESPONSES—ESPECIALLY GIVEN THAT WE DID NOT ALTER ANYTHING ELSE."

DIWAKAR DAVAR, MD

TRANSFORMATIVE THERAPY

Gut Response

DIWAKAR DAVAR AND HASSANE ZAROUR

Jamie Reittinger, a father of three, was living in the shadow of a deadly cancer when he ran out of treatment options in fall 2018. Three years before he had what initially looked like a wart under his thumbnail — it turned out to be melanoma.

Melanoma is the deadliest form of skin cancer. Although timely treatment and surgery are curative in most cases, sometimes patients develop advanced melanoma.

In the past decade, a new wave of immunotherapies has changed care for many cancers, including melanoma. Yet only about 40% of melanoma patients respond, and Reittinger fell into a vexing majority of patients whose cancers fail to respond to these treatments.

"We need to find ways for people with advanced cancers to respond to these treatments," says Hassane Zarour, an MD professor of medicine, immunology and dermatology, who coleads the UPMC Hillman Cancer Center Melanoma Program. He also holds the James W. and Frances G. McGlothlin Chair in Melanoma Immunotherapy Research.

In fall 2018, Diwakar Davar, a hematologist/oncologist and assistant professor of medicine, and Zarour, along with colleagues at the National Institutes of Health, were launching a clinical trial that aimed to do that.

Mounting evidence suggested links between the lineup of species in the brigade of bacteria that live in the gut — the "gut microbiome" — and responses to certain immunotherapies, in particular, therapies targeting the inhibitory immune checkpoint known as programmed death-1 (PD-1).

So Zarour, Davar and their colleagues set out to test whether modifying the microbiome could make immunotherapy work. Their study, supported by the National Cancer Institute and Merck, involved transferring fecal matter from patients whose melanoma responded to immunotherapy into patients like Reittinger, whose cancers had not.

Therapeutically transferring poop — a procedure called fecal microbial transplantation, or FMT — isn't as outlandish as it may sound. Chinese practitioners used this treatment more than 1,500 years ago. Infectious disease specialists have recognized FMT as the most effective treatment for severe diarrhea and colitis (an inflammation of the colon) caused by Clostridioides difficile.

Based on the promising data generated by Davar and Zarour, Reittinger's physician, John Kirkwood, Distinguished Professor of Medicine at Pitt and coleader of the UPMC Melanoma Program, recommended that Reittinger enroll in the clinical trial. Reittinger says he didn't need much convincing to sign on as the study's first participant. It certainly sounded bizarre, he says, but Davar's explanation of FMT — and the absence of other treatment alternatives — reassured him. "I told them, 'OK, sounds cool — as long as you think it's going to work,'" he recalls.

As the researchers reported in the journal Science in February 2021, the study was a remarkable success. Six out of 15 participants for whom immunotherapy previously didn't work benefited from it after receiving FMT. In three of those participants, the cancer went into remission, and in another three it stabilized and stopped growing. Reittinger was in the first group. He received his last immunotherapy treatment in June 2020. And though his cancer might not be completely gone — "there's still what they call nonmeasurable nodules in my lungs," he explains — remaining traces are undetectable by routine scans.

"I can't complain."

Davar was not surprised that the intervention worked, but he was amazed that FMT alone, with no other interventions, would be so effective. "We always believed the signal was there," he says. "But we didn't think that a single FMT transfer would have produced such durable responses — especially given that we did not alter anything else."

Davar and Zarour have already obtained funding to continue testing FMT in larger trials in patients with advanced melanoma and lung cancer. What's still unknown is how exactly the microbiome exerts its influence.

The physicians suspect that certain key bacteria in the gut set up a signaling cascade that can dampen the effectiveness of immunotherapy drugs like PD-1 inhibitors.

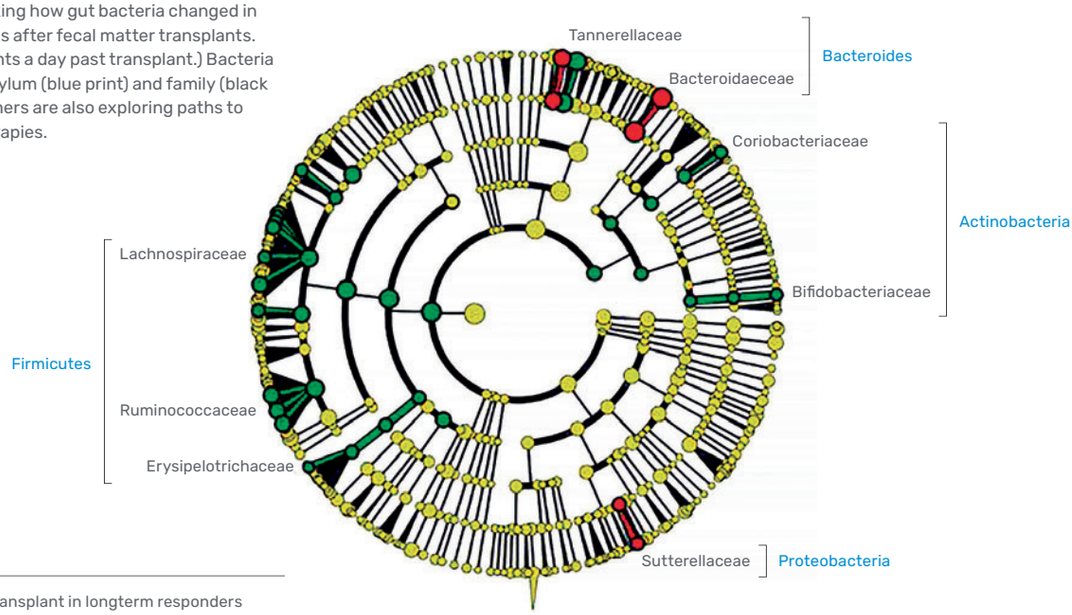
Through more studies in humans and animals, Davar and Zarour hope to further elucidate this mechanism and to pinpoint exactly which bacteria are beneficial so that more targeted forms of bacterial FMT can be developed and tested in cancer patients.

"WE NEED TO FIND WAYS FOR PEOPLE WITH ADVANCED CANCERS TO RESPOND TO THESE TREATMENTS."

HASSANE ZAROUR, MD

Days Post FMT

A transplant of fecal matter helps some patients with melanoma respond to immunotherapy. Pitt physician-scientists are tracking how gut bacteria changed in responding patients after fecal matter transplants. (Each ring represents a day past transplant.) Bacteria are arranged by phylum (blue print) and family (black print). Pitt researchers are also exploring paths to more targeted therapies.



Increased post transplant in longterm responders

Decreased post transplant in longterm responders

Walking the Walk

In December 2020, Anantha Shekhar mused about what medical education might look like by June 2021—his first anniversary as senior vice chancellor for the health sciences and John and Gertrude Petersen Dean of the School of Medicine:

To better take on issues that adversely affect the health of certain communities, Shekhar told Pittsburgh Magazine, "I would like to have a very different culture in the medical school." He noted he was committed to enhancing faculty, staff and student diversity and institutional support for research to combat social determinants of health. Some of those factors include racial prejudice, poverty, poor nutrition and mistrust of health care systems.

"We are doing a lot of programs," says Naudia Jonassaint, an MD, MHS transplant hepatologist who was named the Department of Medicine's first vice chair for diversity, equity and inclusion in 2019 and associate dean for clinical affairs in January 2021.

New in 2021, for example, is a program called Healthcare Leadership and Business Fundamentals, developed by School of Medicine faculty in partnership with Pitt's Joseph M. Katz Graduate School of Business. The program offers training in leadership, team development and foundational business skills. The curriculum is divided into four modules, each concluding with an in-person wrap-up session featuring lecturers from across the United States. The program allows departments throughout the schools of the health sciences to provide formal training for its emerging leaders.

In 2021, the school featured its first-ever boot camp for rising third-year medical students from underrepresented groups. Pitt professors and trainees gave talks aimed at easing the transition onto hospital wards. Among these were presentations on professionalism, rounding, asking for feedback and recommendations.

"We want our medical students to stay here and train with us, but regardless of whether they do or not, we want them to be successful and enjoy the process of learning and growing in the clinical space," says Jonassaint.

THE INITIATIVE—OR "CLUSTER HIRE"—CALLED FOR THE HIRE OF 50 FACULTY MEMBERS OVER FOUR YEARS, WITH THE SCHOOLS OF THE HEALTH SCIENCES RESPONSIBLE FOR HALF OF THAT TOTAL.

HEALTH EQUITY

Underrepresentation: A Chronic Crisis

Onome Oghifobibi, an MD assistant professor of pediatrics, cares for some of the most vulnerable infants in the NICU. He is also developing a program with the Allegheny County Health Department to combat a significant health disparity—the distressing rate of maternal and infant mortality in Pittsburgh's Black and Brown communities. Nationwide, Black women are four times more likely to die or nearly die as a result of pregnancy than White women. Here in Pittsburgh, Black women are more likely to die during pregnancy than their peers in 97% of U.S. cities.

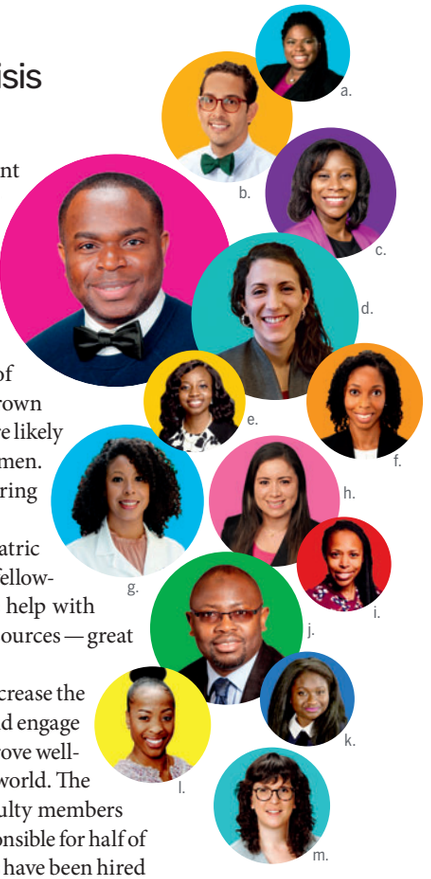
Oghifobibi initially came to Pitt and UPMC for a pediatric residency and then stayed to complete a neonatal-perinatal fellowship. "Staying in Pittsburgh is an opportunity for me to help with the health disparity crisis here," he says. "We have the resources—great universities and a world-class health care system."

Oghifobibi was recently hired as a part of Pitt's plan to increase the number of faculty to conduct research, educate students and engage in service designed to eliminate health disparities and improve well-being in the Pittsburgh region, nationally and around the world. The initiative—or "cluster hire"—called for the hire of 50 faculty members over four years, with the schools of the health sciences responsible for half of that total. Within less than 12 months, 23 faculty members have been hired in the health sciences; 14 in the School of Medicine (as of October 2021). Those hires bring a wealth of academic interests to Pitt—from reducing sexually transmitted diseases among young people to preclinical biomarker discovery in lung cancer.

But recruitment is only part of a successful cluster hire.

Pitt is also actively working to retain new faculty, which involves evaluating hiring departments' mentoring and inclusion plans and planning opportunities for new hires to develop social networks. "In many schools, the approach to diverse, equitable and inclusive recruitment is passive. But this isn't the field of dreams—you know, 'if you build it, they will come.' You have to build relationships with people," says Paula Davis, associate vice chancellor for diversity, equity and inclusion, health sciences. She is coleading the cluster hire effort for the University.

Diversifying the faculty and its research interests will have benefits that go beyond research: Pitt's capacity for innovation will increase, and students and trainees will have role models to provide roadmaps for navigating academic life and career aspirations.



Onome Oghifobibi, an MD, shown above in bowtie in large purple circle, with other new recruits to the School of Medicine. Those include, from top: (a) Melody N. Mickens, PhD, (b) Sebastian Sattui Cortes, MD, (c) Paris Ekeke, MD, (d) Mary Ellen Vajravelu, MD, (e) Mosopefoluwa Lanlokun, MD, (f) Amanda McCoy, MD, (g) Sandra Stinnett, MD, (h) Andrea Ibarra, MD, (i) Tiffany Clark, MD, (j) Taofeek Owonikoko, MD, (k) Martina Anto-Ocrah, PhD, (l) Yetsa Tuakli-Wosornu, MD, (m) Katherine Guyon-Harris, PhD

Early morning: The MobileDerm team prepares for a day of seeing patients at rural clinics. Today it's Coalport, Pennsylvania.

About 4:30 p.m.: The MobileDerm team in Coalport packs up their equipment and loads it back into the Suburban. Today they treated about 25 patients.

Alaina James, an MD, PhD, right, and Camila Ortiz

"EVERY TIME I LEAVE THE CLINIC, EVEN IF IT'S A LONG DAY, I'M ON CLOUD NINE."

CAMILA ORTIZ

OUTREACH

In Dermatology Deserts

ALAINA JAMES

The sun has begun to rise as Alaina James, an MD, PhD assistant professor of dermatology, packs a black Suburban with medical equipment. James and the rest of the MobileDerm team — one resident, one medical student and sometimes an undergraduate — are preparing for a full day of seeing patients at rural community clinics. These areas are often more than an hour's drive from Pittsburgh, places where patients don't have regular access to a dermatologist. James sits behind the wheel on this cool, spring morning. Next to her, a student navigator mixes the directions to Coalport, Pennsylvania, in Clearfield County, with conversation about career goals, favorite restaurants and new movies to watch.

James created MobileDerm to offer dermatologic care to uninsured patients in the greater Pittsburgh area. After enlisting help from a couple of medical students, she expanded MobileDerm's reach into rural areas in central Pennsylvania — counties she calls "dermatology deserts" — and partnered with community leaders to gain traction.

Camila Ortiz, a fourth-year med student, has accompanied James on several visits to clinics in Clearfield and Butler counties, as well as one on Pittsburgh's North Side. Working with James has taught her how dermatologic conditions can "severely compromise people," Ortiz says. "Something as apparent as your skin plays a role in your self-confidence, and how you operate, and how you act around others." The program also offers doctors-in-training opportunities to become more skilled in identifying skin issues in people of color, which often go undiagnosed.

James says she encounters patients of all ages at the rural clinic; they have rashes, lesions, bumps and even melanomas. In the field, they're able to perform biopsies, whole-body skin exams and small procedures such as cryotherapy.

At about 4:30 p.m. in Coalport, the MobileDerm team packs up its equipment and loads it back into the Suburban. Today they treated about 25 patients. Ortiz says: "Every time I leave the clinic, even if it's a long day, I'm on cloud nine."

Page Pennell, MD

Tracey Conti, MD

New Chairs in Neurology and Family Medicine

On July 1, **Page Pennell**, an MD, became chair of the Department of Neurology. Pennell joins Pitt from Harvard University and Brigham and Women's Hospital. Her research has focused on maternal and fetal outcomes of women with epilepsy, antiseizure medication use during pregnancy and the effects of neuroactive steroids on seizure provocation.

Pennell serves as the principal investigator of the National Institutes of Health–funded, nationwide Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs study, which evaluates maternal seizures, depression and obstetric complications, as well as the long-term effects of in utero and infant antiepileptic drug exposure.

As neurology chair, she plans to further develop and expand the department with new faculty recruitments and enhanced collaborations across the campus, to place the department at the forefront of translating discoveries into new clinical strategies that reduce the burden of neurologic diseases.

Tracey Conti, an MD, has been named chair of the Department of Family Medicine. She formerly served as the department's vice chair and program director of UPMC McKeesport Family Medicine Residency.

A Pittsburgh native, Conti earned her medical degree from Temple University. She completed her residency and fellowship at the University of Maryland and joined the Pitt faculty in 2001. She is board chair and past president of the Pennsylvania Academy of Family Physicians.

Family medicine and primary care physicians can be difficult to find and retain. As chair, Conti hopes to grow the number of primary care physicians by creating a centralized home for residency programs that can expose students to the breadth of care this specialty provides. Conti hopes to continually improve quality of care by establishing a practice-based research network to share clinical expertise and experiences. In her new role, Conti will also ensure equitable, high-quality care for the more than 50,000 patients who visit UPMC family medicine facilities.

Distinguished Professors Named

Mark Roberts, MD, MPP Distinguished Professor of Health Policy and Management

Margaret Rosenzweig, **PhD** Distinguished Service Professor of Nursing and professor of medicine

Adrianna Zeevi, **PhD** Distinguished Service Professor of Pathology

2021 Chancellor's Awardees

Distinguished Research Awards

Robert Friedlander, MD, MA chair of neurological surgery and Walter E. Dandy Distinguished Professor

Rebecca Price, PhD associate professor of psychiatry and psychology

Distinguished Public Service Award

Doris Rubio, PhD professor of medicine, biomedical informatics, biostatistics, nursing, and of clinical and translational science; director, Institute for Clinical Research Education (ICRE); director, KL2 Clinical Research Scholars Program; director, Leading Emerging and Diverse Scholars to Success; director of diversity, ICRE

Distinguished Teaching Award

Lisa Borghesi, PhD professor of immunology, director, Unified Flow Core

Did you notice?

National and international news outlets are leaning on Pitt more than ever to make sense of issues related to our health. From July 1, 2020 to June 30, 2021, the School of Medicine and other University of Pittsburgh health sciences programs were mentioned roughly 750 times in top-tier outlets, including NPR, CNN, The New York Times, JAMA, CBS News and many others.

National Cancer Institute Deems Cancer Center "Exceptional"

Some of the finest cancer experts in the world call Pitt home. The National Cancer Institute (NCI) has rated the UPMC Hillman Cancer Center "exceptional"—its highest possible rating. NCI has also provided the Hillman with its largest grant to date—$30 million, which will go toward bettering cancer prevention, diagnosis and treatment.

Noteworthy

WellcomeLeap selected **Susanne Ahmari**, an MD, PhD associate professor of psychiatry, to head up a program to create much-needed advances in mental health. The $50 million program is called Multi-Channel Psych.

Her program is working toward a world in which diagnosing anhedonic depression (which results in the inability to feel pleasure) is, according to Wellcome, as "straightforward as getting a mammogram," so that patients can then be directed to the treatment appropriate for their specific biology.

Angela M. Gronenborn, a PhD who holds the UPMC Rosalind Franklin Chair in Structural Biology and chairs the Department of Structural Biology, received the Biophysical Society's 2021 Founders Award. The Gronenborn lab has solved structures of many medically and biologically important proteins and protein complexes, such as various HIV- and AIDS-related proteins.

Bioengineers **William Wagner** and **Savio L-Y. Woo** were elected fellows of the International Academy of Medical and Biological Engineering. Wagner is director of the McGowan Institute for Regenerative Medicine as well as Distinguished Professor of Surgery, Chemical Engineering and Bioengineering at Pitt. Woo is a Distinguished University Professor and director of the Musculoskeletal Research Center. There are fewer than 250 fellows of the academy throughout the world.

CTSI Renewal

The University of Pittsburgh Clinical and Translational Science Institute (CTSI) has been awarded a five-year, $61 million renewal from the National Institutes of Health. This marks the fourth consecutive five-year Clinical and Translational Science Award granted to the University's CTSI, which has been awarded more than $400 million from NIH to support its programs.

The grant will fund the Pitt CTSI's mission to accelerate the translation of research from the laboratory to individuals in all communities, notably underrepresented populations, to develop medical treatments that better lives.

"We are looking to advance the impact of research," says CTSI director **Steven E. Reis**, an MD who also is associate senior vice chancellor for clinical and translational research, health sciences and Distinguished Service Professor of Medicine. "We will create new programs to support cutting-edge research, increase accessibility to research studies, enable implementation of research findings in practice and train the next generation of clinical and translational scientists."

Sickle-cell Therapy Alternatives

The Patient-Centered Outcomes Research Institute (PCORI) awarded **Charles Jonassaint**, a PhD, MHS assistant professor of medicine, $4.3 million to undertake the largest-ever study of cognitive behavioral therapy (CBT) as a nonpharmacological alternative for sickle cell disease-related pain management.

Typically, patients with sickle cell disease lack access to CBT. This is particularly true during pandemic conditions. Jonassaint's study focuses on improving access and uptake of CBT for people with sickle-cell disease by providing a health coach–supported, digital CBT program that patients can access on any mobile device or computer.

Elite Clinical Scientists

Once again, Pitt Med physician scientists were elected into the American Society for Clinical Investigation. The new members include **Walid Gellad,** an MD and MPH who is associate professor of medicine and of health policy and management; **Jacqueline Ho**, an MD, MSc associate professor of pediatrics; **Philana Ling Lin**, an MD, MSc associate professor of pediatrics; **Heath D. Skinner**, an MD, PhD associate professor of radiation oncology; and **Matthew Steinhauser**, an MD associate professor of medicine.

Timothy Billiar, an MD, the George Vance Foster Professor and chair of surgery, was elected to the Association of American Physicians. Election to AAP is an honor extended to physicians who stand out for their work in basic or translational biomedical research; invitations are limited to 70 persons per year. Billiar, Distinguished Professor of Surgery, has also been named executive vice president and chief scientific officer for UPMC and senior associate vice chancellor for clinical science at Pitt. He will serve as the primary liaison between UPMC and the health sciences.

(Left to right) Top, Gellad, Ho; Middle, Lin, Skinner; Bottom, Steinhauser, Billiar

“EVERYTHING CAME ONE AFTER ANOTHER, EACH TIME A HUGE SURPRISE.”

IVET BAHAR, PhD

Insight on Inflammation

Why do some people with COVID-19 develop severe inflammation?

A collaboration between the University of Pittsburgh and Cedars-Sinai, in Los Angeles, offers a likely answer.

The study, published in the Proceedings of the National Academy of Sciences, uses computational modeling to zero in on a part of the SARS-CoV-2 spike protein that may act as a “superantigen,” kicking the immune system into overdrive as happens in toxic shock syndrome.

Symptoms of a condition in pediatric COVID-19 patients known as multisystem inflammatory syndrome in children (MIS-C) include persistent fever and severe inflammation. While rare, the syndrome can be serious or even fatal.

The first reports of this condition coming out of Europe caught the attention of study cosenior author Moshe Arditi, an MD at Cedars-Sinai, who is an expert on another pediatric inflammatory disease—Kawasaki disease.

Arditi contacted longtime collaborator Ivet Bahar, a PhD, Distinguished Professor and John K. Vries Professor and Chair of Computational and Systems Biology at Pitt, and the two started searching for features of SARS-CoV-2 that might be responsible for MIS-C. Bahar and her team created a computer model of the interaction between the SARS-CoV-2 viral spike protein and the receptors on the foot soldiers of the immune system—T cells. When T cells are activated in abnormally large quantities, as is the case with superantigens, they set off what’s known as a cytokine storm, leading to inflammation.

Using the model, the team was able to see that a region on the spike protein with superantigenic features interacts with T cells. They compared this region to a bacterial protein that causes toxic shock syndrome and found striking similarities in both sequence and structure. “Everything came one after another, each time a huge surprise,” says Bahar.

“Our research raises the possibility that therapeutic options for toxic shock syndrome may be effective for managing and treating MIS-C in children and hyperinflammation in adult coronavirus patients,” says Arditi. Since the PNAS publication, the Bahar lab has found an antibody specific to the superantigen, which in tests conducted in vitro also interferes with viral entry.

Covid Comfort

Imagine, you move to Pittsburgh for your first year of medical or graduate school, but it’s the summer of 2020. You’d like to relax with new friends, maybe share a bite to eat—yet potlucks just aren’t the same on Zoom.

Eva Roy, then a third-year student, was determined to help Pitt Med newbies feel nourished and part of something special. So she mobilized the school’s culinary medicine interest group, which created Pitt Med cookbooks for incoming classmates.

The group was founded as the pandemic started and the Culinary Medicine course—a mini elective—couldn’t meet in person. The cookbook includes contributions from fellow Pitt Med students, faculty, alumni and staff.

“Cooking can be a wonderful way for students to take a break and get to know other members of the Pitt Med community through recipes, recommendations on cooking and wellness and tips for grocery stores in the area,” says Roy.

Roy especially recommends associate dean Donald DeFranco’s chicken scallopine recipe or the gazpacho recipe from John Schumann, recently retired anatomy course director.

Secretary Blinken at the Center for Vaccine Research.

FRONTLINES

The Place for Pandemic Preparedness

NATIONAL LEADERS TOUR PITT

The University of Pittsburgh Center for Vaccine Research (CVR) was a popular stop in fall 2021 among national leaders.

Secretary of State Antony Blinken toured the CVR in September 2021 to learn how faculty here are contributing to the fight against COVID-19 and what it takes to tackle emerging infectious disease threats. Then Sen. Bob Casey, a champion of biosafety lab funding, toured the CVR in October.

How did the center get to be a destination? On Valentine's Day 2020, CVR Director W. Paul Duprex, who holds the Jonas Salk Chair in Vaccine Research, received a package — samples of the novel coronavirus — making the CVR among the first facilities in United States with that resource. Pitt researchers and their collaborators worldwide have since made significant contributions toward understanding the virus's biology and developing promising treatments.

"If we've learned anything during the last 18 months, it's that we can't ignore the threat of emerging infectious diseases," Chancellor Patrick Gallagher said during Blinken's visit. "The University of Pittsburgh's Center for Vaccine Research is uniquely positioned to tackle this challenge, and it complements a deep bench of talented Pitt scientists, clinicians and scholars that is pushing the frontiers of this research forward every day."

After his tour, Blinken tweeted, "Biomedical research is key to protecting public health, including reducing the risk of future pandemics. Thank you to the team at @PittTweet Biomedical Research Facility for saving lives and improving American health security."

"Pennsylvania and the nation need dedicated researchers like Dr. Duprex and his team at the Center for Vaccine Research," Casey said. "We're pretty blessed that we've got so much talent and the benefit of so much research here."

"It's hard to get across what we do sometimes," said Natasha Tilston-Lunel, a PhD postdoctoral associate working with Duprex. "Having visibility for this work is so important."

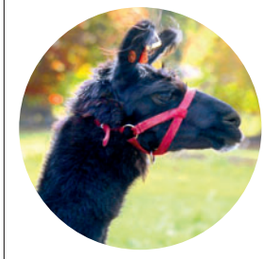
Healing Highlights

Hundreds of bench and clinical researchers at Pitt investigated ways to get us out of the pandemic. Here are a few highlights shared with Secretary of State Antony Blinken:

Associate professor of infectious diseases and microbiology **Amy Hartman** showed Blinken what SARS-CoV-2 infected cells look like under a microscope. She noted that early CVR efforts were devoted to understanding the course of the disease and how the virus replicates.

Matthew Neal, the Roberta G. Simmons Associate Professor of Surgery, briefed Blinken regarding how Pitt and its clinical partner, UPMC, work in tandem with medical centers throughout the world to pinpoint effective treatments for COVID-19 — at an unprecedented pace. Clinical trials that are adaptive, that learn and adjust as they go, are yielding life-saving insights.

CVR Director **Paul Duprex**'s lab collaborated with **Yi Shi**, then assistant professor of cell biology, to develop "nanobodies" cloned from a llama that could become inhalable drugs to treat and prevent COVID-19 infection.



US News and World Report* ranks medical school programs

Best Specialty Programs

Psychiatry: 7th

Surgery: 10th

Best Medical Schools

Primary Care: 10th

Research: 14th

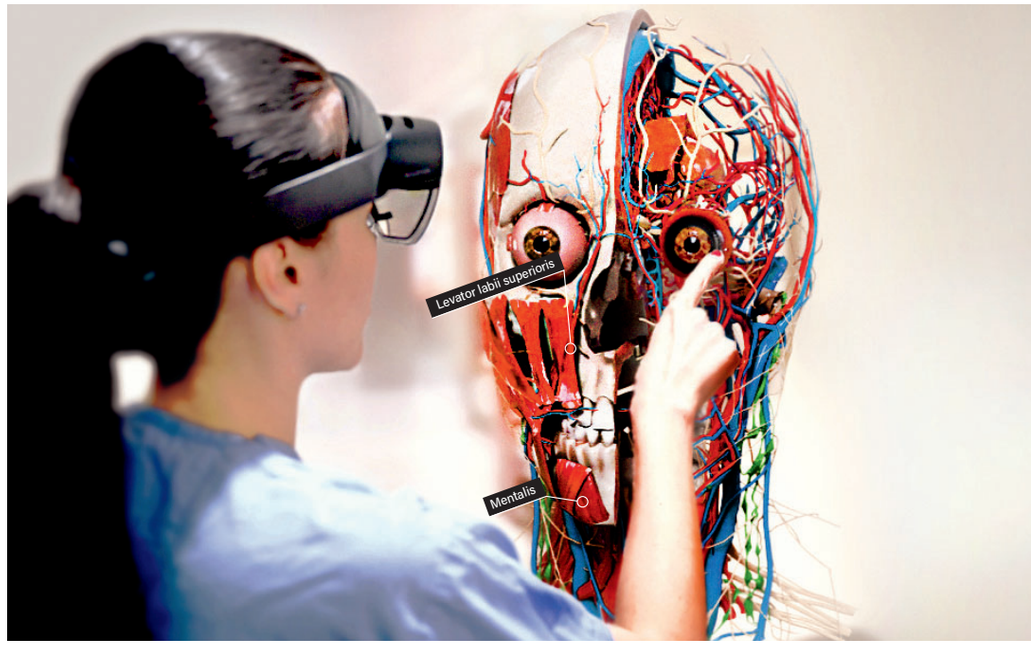
*Rankings released in 2022.

Rising

On Aug. 26, 2021, construction workers raised one of the final beams for the West Wing addition to Alan Magee Scaife Hall. This addition will allow Pitt Med to keep a step ahead of new educational approaches, better integrate team building into learning and offer health sciences students spaces to study and relax. Best of all, some might say, the new structure and Scaife renovation will let in plenty of natural light.

"IT'S ONE OF THE MOST EXCITING EFFORTS I'VE EVER BEEN A PART OF."

CHRISTOPHER O'DONNELL, PHD



Among other initiatives, emerging technologies office staff members are exploring partnerships with health sciences faculty and industry representatives to supplement anatomy curricula with augmented reality.

EMERGING TECHNOLOGY

Immersed and Integrated

On July 1, 2021, Dean Shekhar announced the creation of the Office of Emerging Technologies in Health Sciences Education at Pitt. The new office is led by Christopher O'Donnell, a PhD associate vice chancellor for emerging technologies in health sciences education.

"Pitt is unique in having six highly ranked schools of the health sciences, as well as experts in immersive technology and education innovation," Shekhar said. "It's time we had an official office to help guide the strategic integration of multiple diverse digital technology learning initiatives across Pitt Health Sciences."

The Laboratory for Educational Technology in the School of Medicine will be a key partner.

Yet the office is not just about shepherding new technologies. It's establishment signals a shift in thinking about the future of Pitt Health Sciences education — making it more integrated, accessible and equitable. Said O'Donnell: "It's about collaborating and networking, finding what's out there, connecting what's going on across silos, making things happen between upper and lower campus, generating new business opportunities and scaling technologies and programs that are successful.

"We're learning more every day about where we can add value and support to the people on the ground making things happen. It's one of the most exciting efforts I've ever been a part of.

"Technology is changing at a crazy rate. We don't know where we'll be a year from now."

"PITT IS UNIQUE IN HAVING SIX HIGHLY RANKED SCHOOLS OF THE HEALTH SCIENCES, AS WELL AS EXPERTS IN IMMERSIVE TECHNOLOGY AND EDUCATION INNOVATION."

DEAN SHEKHAR

All told, Scholars Day 2021 recognized exceptional talent and hard work. **120** graduating students participated in the Longitudinal Research Project. Student publications: **255**. Submitted manuscripts: **76**. Presentations: **320**. National or state awards: **67**. Local awards: **163**.

114 students participated in research during the summer between their 1st and 2nd years of medical school (2018). These students received competitive funds from the dean, UPMC Children's Hospital of Pittsburgh, the Departments of Medicine, Pathology and Psychiatry, as well as NIH T35 and T32 grants to individual School of Medicine research groups.

Originals

Named for Bert and Sally O'Malley, the **O'Malley awards** for outstanding longitudinal research projects are given each year at Scholars Day to medical students during their four or five years in med school. Awardees are in basic and clinical science. In 2004, Pitt Med began requiring incoming medical students to complete an original research project; now many top schools do the same.

BASIC SCIENCE

Chandler Hudson
MD '21

MENTOR:
Donald DeFranco, PhD

PROJECT:
Cyclooxygenase-1 Expression Is Elevated Within Human Benign Prostatic Nodules and May Result from Inhibition of Complex I of the Mitochondrial Electron Transport Chain

DESCRIPTION:
This project looked at the cause for a type of prostate enlargement not thought to be a precursor to prostate cancer, called benign prostatic hyperplasia (BPH). The culprit for this disease is an enzyme that produces inflammation in prostate tissue—and findings suggested that mitochondrial dysfunction is at the root of the problem. More research into targeted therapies to preserve mitochondrial function within the prostate may decrease the incidence of BPH.

Vivek Sudhakar
MD '21

MENTOR:
Lluis Samaranch, PhD

PROJECT:
"Infuse as You Go" Convective Delivery to Enhance Coverage of Elongated Brain Targets

DESCRIPTION:
This project assessed a new strategy for drug delivery to the brain that has been adapted for clinical trials in human participants. It allows for more efficient drug delivery to the central nervous system to one day treat diseases such as Parkinson's, Huntington's and AADC deficiency.

CLINICAL SCIENCE

Gideon Nkrumah
MD '21

MENTOR:
John Fowler, MD

PROJECT:
Ultrasonography Findings in Severe Carpal Tunnel Syndrome

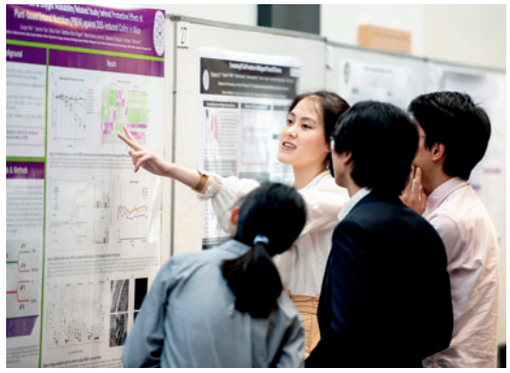
DESCRIPTION:
Millions of Americans are usually diagnosed with carpal tunnel syndrome (CTS) using a time-consuming and expensive test called a nerve conduction study, which involves pins and electrodes as assessment tools—not pain-free. This project looked at what other variables can be used to assess and diagnose the severity of carpal tunnel syndrome. Ultrasonography findings in 274 wrists suggested that ultrasound can be used to grade CTS severity in patients younger than 65.

Stephen Canton
MD '21
Clinical Scientist Training Program

MENTORS:
William Anderst, PhD
MaCalus Hogan, MD, MBS

PROJECT:
Syndesmosis Repair Affects In Vivo Distal Interosseous Tibiofibular Ligament Elongation Under Static Loads and During Dynamic Activities

DESCRIPTION:
Findings suggest that a surgical repair for high ankle sprain (ankle syndesmosis instability) fails to restore the static and dynamic function to these ligaments. This finding could provide valuable insight for operative and overall clinical management of these injuries in the future.



Seventeen new Tsinghua Scholars arrived in 2021.

Gone Global

In 2021, the School of Medicine renewed its agreement with Tsinghua University in China for a third five-year term. Since the program began, Pitt has hosted Tsinghua visiting scholars for two years of mentored training in biomedical research.

Although COVID-19 halted the program in 2020, a cohort of 17 new scholars arrived in Pittsburgh mid-January 2021. Another 28 scholars have been invited for the 2022 cohort and will arrive in August. To date, more than 100 Pitt faculty members have hosted and mentored students from Tsinghua University, sometimes called the MIT or "Oxbridge" of China, and one of the world's top 10 universities.

As of 2020, the Tsinghua Scholars program had 152 alumni listed as coauthors on more than 199 articles in peer-reviewed journals. Here are a couple of examples of the topics these scholars are taking on:

Haopu Yang coauthored a paper in in the Annals of Translational Medicine, which underscored that ventilation, the mainstay treatment for acute respiratory distress syndrome, may help the lungs but hurt the kidneys over time because of a complex cross-talk between the organs. Georgios Kitsios, assistant professor of medicine, was Yang's faculty mentor.

This past year, Edward Burton, associate professor of neurology and of microbiology and molecular genetics, and UPMC Professor of Movement Disorders, hosted Binxuan Jiao, who, he says, was spectacular. "Jenny (Binxuan) exploited a clever approach in living transgenic zebrafish to show that precision damage to the energy centers of neurons caused delayed cell death. [The study was published in eLife.] This work provides a powerful basis for ongoing studies to understand the biochemical mechanisms underlying degeneration of neurons in Parkinson's disease, which affects more than 10 million people worldwide."

Pitt Med operates on a global stage, with active collaborations connecting Pittsburgh with China, France, Ghana, Honduras, India, Ireland, Italy, Kazakhstan, Malawi, the Philippines, Vietnam and many other nations.

Class of the Total Solar Eclipse

On Match Day, members of the Class of 2021 learned where they would spend the next phase of their careers. As many of the day's speakers mentioned at a hybrid ceremony, 2021 was no ordinary class: They started medical school during a total solar eclipse, and they finished during an ongoing pandemic.

"We were the first class to train in a global pandemic. We were the first class to make major antiracist and gender inclusive curriculum reform. We were the first class to do residency interviews virtually and to decide on a program without having seen it," said Class President Jennifer Perez. Despite these challenges, Pitt Med students placed "spectacularly" well in the highly competitive process, according to Joan Harvey, former associate dean for student affairs.

Dean Anantha Shekhar had these words for the Class of 2021: "What an extraordinary year you have spent in terms of challenges. You've come through with flying colors. You've been incredibly aware of social injustices and structural racism in medicine. You've assisted with collecting food and serving those in need. You even assisted with child care. This is a class that's shown not only that they're great doctors and fantastic students, but they're people with big hearts. That's really what I admire about you."

Elizabeth Miller, an MD, PhD professor of pediatrics, recognizes that the conventional ways that doctors and researchers interact with patients and communities are not always the most effective. She's made strides to change that, to the benefit of many thousands of young people.

PARTNERS

Rewriting Playbooks

ELIZABETH MILLER

Backstory

"Are you feeling safe in your relationship?" When the physician-in-training asked her the conventional screening question, the 15-year-old girl nodded.

Two weeks later, the girl's boyfriend pushed her down a flight of stairs, inflicting a head injury so severe that she was taken to the emergency room.

"In that moment, I realized I had missed something," says Miller, the screening physician, who's now the Edmund R. McCluskey Professor of Pediatric Medical Education at Pitt, as well as division director for adolescent and young adult medicine.

Determined not to let others slip through the cracks, Miller dedicated herself to addressing intimate partner violence more effectively. Ordinarily, clinicians would ask their patients "Are you being abused?" or "Are you in a relationship where you're afraid or feeling unsafe?" But according to multiple studies, these yes-or-no questions alone do nothing to improve quality of life for domestic abuse survivors.

To address this issue, Miller cocreated the CUES intervention: Confidentiality, Universal Education, Empowerment and Support. In a fully confidential space, a health professional provides patients with a clear and

concise brochure, which they can use for themselves or share with others. The brochure explains various forms and warning signs of interpersonal violence, as well as listing resources that can provide support.

This approach, of simply sharing information, has been shown to increase recognition of abusive behaviors, increase survivors' confidence in seeking help and prevent violence against people who have not already experienced it. Clinics throughout the country have adopted this approach.

Coaching the Coaches

To help young men navigate adolescence and build healthy relationships, Miller developed (with a national prevention organization called Futures Without Violence) and tested "Coaching Boys Into Men," a training program for high school athletic coaches. A series of playbooks and scripts helps coaches discourage young men from perpetuating violence toward women and girls and encourages them to intervene when someone else exhibits troubling behaviors. Participating boys increased their positive bystander behaviors by more than 50% compared to boys in a control group.

The idea for this evidence-based program, tested in 41 middle schools in the Pittsburgh region, came from asking men how to best put an end to intimate partner violence.

Community Scientists

With others here in Pittsburgh, Miller shares a "truly audacious vision that every child in Allegheny County should be healthy, thriving and meeting their academic goals." They are taking particular care to watch out for those who have the deck stacked against them.

"It's audacious, but it's totally doable," she says.

Suggestions about how to approach this massive task stem from families and community members working alongside scientists. "We're flipping the script," says Miller, coleader of the Pittsburgh Study, which plans to enroll 25,000 southwestern Pennsylvania children over the next two decades. Each facet of the study is co-led by one member of academia and one member of the Pittsburgh community. In more typical group studies, community members might occasionally be asked for feedback on a flyer or consent form, but not to shape a study's scientific questions.

"This is an opportunity for us to think about what does research 'with' community look like as opposed to research 'on' community," says Miller.

Then "we will start to ensure that we have a bright future for all of our children."

"WE'RE FLIPPING THE SCRIPT... THIS IS AN OPPORTUNITY FOR US TO THINK ABOUT WHAT DOES RESEARCH 'WITH' COMMUNITY LOOK LIKE AS OPPOSED TO RESEARCH 'ON' COMMUNITY."

ELIZABETH MILLER, MD, PHD

Students complete morning activities in their first-grade class at Pittsburgh Beechwood PreK-5.

The Pittsburgh Study is a 20-year effort that will enroll 25,000 Pittsburghers, from right before birth to adolescence, and collect a broad range of data to determine the most important biological, social and community influences to childhood health and thriving. More than 100 investigators from the University of Pittsburgh and from the community are shaping the scientific questions that will lead to developmentally appropriate interventions.

Cohort study designs include experimental studies of parent-child interventions and randomized trials of community-designed programs in schools and neighborhoods, as well as longitudinal surveys and other tools. Five years into this collective impact initiative, study organizers expect to see a 25% increase in future orientation (a predictor of young adult health and well-being) and an overall increase in high school graduation rates.

DONORS

With grateful appreciation for their generosity, we acknowledge the following individual, corporate and foundation donors whose contributions of $1,000 or more to the University of Pittsburgh School of Medicine, UPMC Hillman Cancer Center and UPMC Western Psychiatric Hospital, between July 1, 2020 and June 30, 2021, have supported us in our academic, research and clinical missions.

Thank you.

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"DR. COLLINS DID SUCH A GREAT JOB WITH MY DAD THAT WE WANTED TO SHOWCASE THE KIND OF FACILITY IT IS."

RYAN BLANEY

Ryan Blaney and family members Erin, Lisa, Dave and Emma (Conley)

DONOR PROFILE

Ryan Blaney Family Foundation

In 2006, professional race car driver Dave Blaney survived a violent crash that sent his sprint car flipping over several times. He was released from the hospital quickly and sent home to recover. He felt dizzy at times but attributed it to the vertigo he'd experienced every so often.

After a week or two, feeling well enough to compete again, Blaney hopped into his car. The minute the race began, he looked at the backstretch; it was swimming back and forth. He knew immediately that he was not OK — and was nervous he might never be well enough to race again.

Race car driving is a Blaney family passion. Legend of the modified dirt track circuit Lou Blaney is Blaney's father. NASCAR's Ryan Blaney is his son. And his brother, Dale Blaney, is a veteran sprint-car driver. The idea of not racing was difficult for Blaney to imagine. He knew that fellow racer Dale Earnhardt Jr. had experienced numerous concussions and only found relief after seeing a specialist at the University of Pittsburgh.

Earnhardt Jr. connected Blaney to Michael "Micky" Collins, Pitt professor of orthopaedic surgery and clinical and executive director, UPMC Sports Medicine Concussion Program. Collins put Blaney at ease.

"He immediately gave Dave hope," says his wife, Lisa Blaney. "Dave had felt so bad, thinking he couldn't race anymore, but Dr. Collins said Dave would be fine, that the concussion was treatable and gave Dave exercises to do. He has had no problems since. It went from this dire, career-ending situation to Dave being back to normal in a month. We're forever grateful."

A relative of the Blaneys later experienced debilitating concussion symptoms after hitting his head at work. For a year he was passed from doctor to doctor. Lisa Blaney suggested that he see Collins. After a consultation, she says he felt hopeful he'd get his life back. And he did.

Lisa Blaney and her family decided they wanted to help others in similar situations.

The project was perfect for the Ryan Blaney Family Foundation, which focuses on brain health. (The other arm of the foundation is devoted to Alzheimer's disease, from which Lou Blaney suffered.) The foundation made a gift to the Sports Medicine Concussion Program in the Department of Orthopaedic Surgery and funded two concussion fellowships (the Fund-a-Fellow program) to help the program team see more patients, conduct more research and advance the standard of care.

"Dr. Collins did such a great job with my dad that we wanted to showcase the kind of facility it is," says Ryan Blaney.

"As a foundation, we want to raise enough funds to advance research, but one of our biggest goals is to raise awareness," says Erin Blaney, Ryan's sister. "The more we can help people know the signs and symptoms and how to help their loved ones, that's what we want to do."

"We've been really fortunate in our lives," says Ryan Blaney, "and we want to try to help people through tough times."

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"I HAVE TO PINCH MYSELF SOMETIMES. HERE I AM, A KID FROM RURAL SOUTH GEORGIA DOING ROBOTIC SURGERY ON PEOPLE."

BRIAN PETTIFORD, MD

Brian Pettiford, MD

DONOR PROFILE

Brian and Patricia Pettiford

Brian Pettiford's path to becoming a thoracic surgeon began with heartbreak. When he was young, his beloved grandmother died of a heart attack. The loss was devastating, but it also made him wonder: *What's so special about the heart? How can its sickness cause someone to die?*

His parents' careers naturally fed that spark. He listened to his mother's stories about her job as a nurse on the surgical floor of the local hospital in Tifton, Georgia. He hung out with his father, grandfather and uncles — all auto mechanics — in the service station, marveling at how they could pick apart a car and fix what was wrong.

Pettiford (MD '96, Res '01, Fel '03) attended Morehouse College and eventually the University of Pittsburgh School of Medicine. The move from Georgia to Pittsburgh was, in his words, a culture shock.

"I was in the big leagues, studying to be a doctor," he says. "On the one hand, it was exciting because this was what I always wanted to do. On the other hand, it was like, 'Am I going to be able to compete?' But, once I got in and settled, whatever reluctance I had abated."

Pettiford fondly recalls Nancy Washington, a PhD and then-assistant dean for minority affairs; she helped create his "home away from home" at the School of Medicine.

"If I had any social challenges, needed emotional support or if I needed help developing better study habits, her office was a resource," he says. "Just chatting with her meant a lot."

At Pitt, Pettiford was also deeply influenced by surgeon mentors Peter Ferson and Henry Bahnson. Bahnson was Pitt's longest-serving chair of surgery and among the first surgeons in the United States to perform a heart transplantation. Pettiford keeps an autographed photo of Bahnson next to his desk so that the legendary surgeon can look over his shoulder.

Overall, Pettiford was at Pitt from 1992–2003 for the duration of his medical education and training. His wife, Patricia Pettiford, has an MBA from Pitt, and their son attends the University. It is not just the Pettifords' appreciation for Pitt that moved them to contribute to the Dr. Chenits Pettigrew Jr. Fund for Diversity Affairs and to the Charles M. Hefflin Minority Medical Student Scholarship, they are dedicated to helping students afford their education. Pettiford has never forgotten the exit interview from Pitt Med.

"Before we left school, we'd interview with a financial aid person who detailed our debt burden and how long it'd take to pay it off," he says. "Some of my classmates were in tears after that interview. Seeing that reaction makes you want to keep someone else from having that negative experience."

Pettiford is head of general thoracic surgery at New Orleans' Ochsner Health. But he refers to himself as a "body mechanic" in tribute to his family, from whom he learned how to find and fix what was broken.

"I have to pinch myself sometimes," he says. "Here I am, a kid from rural south Georgia doing robotic surgery on people. When I was a student, I remember thinking, 'I'll never be on Bahnson's or Ferson's level. I'll never do what they do, putting people on heart bypass or doing esophagectomies.' But then I take a step back and realize, *Wow — I am doing it.*"

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"PITTSBURGH IS MY HOME. BUT IT IS ALSO HOME TO AMAZING HEALTH CARE WORKERS AND INNOVATIVE TECHNOLOGICAL DEVELOPMENTS BEING PURSUED BY THE SMARTEST MINDS. "

ALBA TULL

Alba Tull

DONOR PROFILE

Alba Tull

Alba Tull's interests are diverse. She is the founder of First Light Capital Group, which invests in public equities, private equities and debt. The firm also separately seeds and funds women entrepreneurs, primarily in technology and pharmaceutical industries. Many of these women — "the talent of the future," as she calls them — are deploying cutting-edge technologies. Additionally, she is an accomplished photographer and film producer. Tull is also incredibly dedicated to Pittsburgh. Although not a native, she is "extremely proud" to call the city home and is passionate about investing in its "ed-meds-tech" culture.

"I love talking to people about Pittsburgh; the innovation that is so commonplace here is still not yet widely understood," says Tull.

Three years ago, Tull met Joseph C. Maroon, Pitt's Heindl Scholar in Neuroscience and clinical professor and vice chair of neurological surgery, who has been neurosurgeon to the Steelers for decades. Tull, who started college at 16 in premed studies and always had an interest in neurosurgery, was particularly taken by the innovative treatment and revolutionary imaging technology that helped Ryan Shazier of the Steelers walk again after a serious injury. Maroon then invited her to observe some procedures, and she was inspired.

Brain or spine surgery, of course, involves tremendous skill, expertise, some calculation — it also typically involves a bit of educated guessing.

"A common procedure we do for someone with head trauma is a ventriculostomy–inserting a small tube into the brain ventricle to relieve pressure," says Maroon. "We use precise measurements, but it's still done relatively blindly and with about a 20% risk of misplacing the tube, which can lead to complications."

Yet a new technology, which involves a 3-D Microsoft HoloLens to perform surgery in augmented reality, makes the procedure nearly 100% accurate, says Maroon, "and markedly reduces morbidity and mortality."

During procedures, surgeons wear a headset to which data from any kind of neuroimaging — like CT scans, MRIs, angiograms — are downloaded and viewed. "I look through the headset and can see inside the patient's brain. It's like being Superman with X-ray vision," says Maroon.

Alba Tull recognized the promise of this technology and wanted to make it more available. So she made a generous gift to the School of Medicine dedicated to designing and expanding imaging technologies for patient care, to developing a more sophisticated understanding of the brain at the molecular level and to supporting education and research in the Department of Neurological Surgery.

"Alba Tull's generosity and the creation of this augmented-reality laboratory will significantly increase the department's role in education, improving patient care and reducing morbidity across several surgical disciplines," says Robert Friedlander, Walter E. Dandy Professor, Distinguished Professor and chair of neurological surgery.

Maroon and Ted Andrews, a senior neurosurgical resident, are working with Pitt's Office of Emerging Technologies in Health Sciences Education to develop an augmented-reality anatomy curriculum to run in parallel with classic cadaver anatomy coursework. They are also helping to develop a medical innovation and entrepreneurship training program that will host a med student each year.

"Pittsburgh is my home," says Tull. "But it is also home to amazing health care workers and innovative technological developments being pursued by the smartest minds, like Dr. Maroon. This gift is about supporting those in the medical field and giving them the space and technology they need to continue saving lives. I'm proud to be a part of it."

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IF ANYONE COULD COME CLOSE TO PERPETUAL MOTION, IT WAS FREDDIE FU."

ANANTHA SHEKHAR, MD, PhD

Dedication

This report is dedicated to Freddie Fu, an MD, whom we lost in 2021. Fu, the David Silver Professor and chair of orthopaedic surgery from 1998 to 2021, was an extraordinary healer, mentor and friend to all. He was an energizing force, whose own reimagining advanced orthopaedic surgery, sports medicine and the City of Pittsburgh. He is dearly missed.

For a tribute to Fu in Pitt Med Magazine, see pi.tt/tributefu.

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