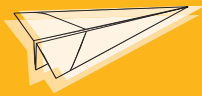


PITTMED

MED STUDENTS LEARN
TO ATTEND TO THEIR
MINDS SO THAT THEY CAN
ATTEND TO PATIENTS

CULTIVATING EQUANIMITY





REFLECTING ON REBIRTH

Under the direction of Dr. Thomas E. Starzl, I received a liver transplant on June 10, 1990, at UPMC Presbyterian. Starzl told me in late May of that year that my liver had almost completely shut down, and I had less than 30 days to live. I received the liver from a 16-year-old boy who died unexpectedly in Cleveland; his parents donated his organs. After a 12-hour procedure, I remained in the hospital for a month. When I left the hospital, the doctors told me that I had a 25% chance to live five years. Three months after the transplant, I returned to work and didn't miss another day for five years, until I retired.

My liver started to fail the day I was born, because of the genetic disorder alpha-1 antitrypsin deficiency. We didn't know the cause until my brother had a transplant a year after mine for the same reason.

I had many symptoms before the transplant; immediately after the transplant, they were all gone. The surgery allowed me to meet several important people that I otherwise would not have known: three daughters-in-law, six grandchildren and one great-grandchild.

I'm now 86 years old. Hospital administrators have told me that there are no records to confirm it, but I believe I may be the longest-living liver transplant recipient at 33 years out. The procedure was experimental at that time, and there weren't many

recipients before me. The failure rate was very high then.

Many thanks to Pitt's School of Medicine, UPMC and Dr. Starzl for giving me so many more years to experience life.

Charlie Scott
St. Augustine, Florida

THE JACKET GAVE HIM AWAY

The lower-right picture on page 36 in the Summer 2023 issue is of my husband, William I. Smith Jr. (MD '72). We have a copy of the photo, which I think was taken when he was doing pediatrics at what now



is UPMC McKeesport. (They had a run on measles at the time.) We had just started dating then, and I certainly remember that plaid jacket he's wearing.

Susan H. Smith
Frederick, Maryland

RECENT MAGAZINE HONORS

Winner, 2023 Graphic Design USA Health + Wellness Design Awards, Publication in Print, Website, Mobile, Digital (2023 Summer Issue)

Winner, 2023 Press Club of Western Pennsylvania Golden Quill, Excellence in Written Journalism, Medical/Health—Division 4 (E. Vitone, "911, What's your emergency?")

Finalist, 2023 Press Club of Western Pennsylvania Golden Quill, Excellence in Written Journalism, Medical/Health—Division 4 (M. Passmore, "Hidden in plain sight")

ADDRESS CHANGES/ CORRECTIONS:

ATTN: **Alex Rigby**
Email: AMR276@pitt.edu
+1-412-789-5866

CORRESPONDENCE:

We gladly receive letters (which we typically edit for length, style and clarity).
Email: medmag@pitt.edu

The power of compassion

“Have compassion for all beings, rich and poor alike; each has their suffering. If your compassion does not include yourself, it is incomplete.”

—*Teachings of Buddha*



Dear Pitt Med Readers,

A doctor with a good bedside manner, holding open discussions with patients about diagnosis, exploring their cultural and psychosocial context, developing appropriate treatment plans, arranging effective follow-ups and connecting patient families to needed support services—that’s the ideal holistic medical practice. Yet in the real world today, the ideal can be hard to achieve. Instead, doctors are trying to keep up with the enormous increase in medical knowledge, the need for preapprovals for medical interventions, the requirements of electronic health record systems and the complexity of coordinating follow-up care through our fragmented social resources—while being allotted inadequate time to spend with each patient. Many physicians are overwhelmed and burnt out.

Likewise, our future physicians feel pressure. Medical students may be challenged to find adequate time to master the enormous amount of biomedical knowledge required of them, to perform at top levels on tests and to put in extended hours on clerkships, while trying to catch up from the day’s work and learn new clinical materials. The resulting reduced personal and family time also threatens to erode well-being.

Therefore, we have an urgent need not only to teach our medical students the best ways to care for themselves but also to help them become resilient physicians in the future. To accomplish this, we are implementing many innovative initiatives in our new curriculum, which we introduced this year.

This issue of Pitt Med describes some of the programs we are developing with our medical students and highlights one unique program: compassion training, in the true Buddhist sense.

We normally think of compassion as driven by sympathy for someone who is unfortunate enough to be afflicted with a disease or is in discomfort. However, in the Buddhist sense, “compassion” is a human value that has many deeper dimensions.

The compassion we instinctively feel for someone who is suffering is unidimensional, “simple compassion.” Training in Buddhist compassion urges us to practice “immeasurable compassion,” a multidimensional state that includes not just the suffering patient, but the suffering of families and, importantly, the suffering of the caregiver. Of course, there are several even higher states of Buddhist compassion and spirituality—all the way to “enlightened compassion” achieved by the Buddha himself.

Practicing such multidimensional compassion not only guides us to better care for the whole patient and provides comfort to their family and friends, it also helps us to be mindful of our own reactions, frustrations and loss, leading to better self-care.

As you will read in this edition’s cover story, our students at Pitt Med are learning how the practice of compassion can help them become better physicians while taking better care of themselves. We look forward to evaluating how these programs prepare our students for the future.

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

PITTMED

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE MAGAZINE

FALL 2023 VOL. 25, ISSUE 3

PUBLISHER

Anantha Shekhar, MD, PhD

EDITOR IN CHIEF

Erica Lloyd, MFA

ART DIRECTOR

Elena Gialamas Cerri

SENIOR EDITOR

Andrew Doerfler

ASSOCIATE EDITOR

Michael Aubele

CIRCULATION MANAGER

Maggie Clark

WEBMASTER

Brandon Copp-Millward

INTERNS

Vivian Wang (Class of '26)

Juliana Briggs

EDITORIAL ADVISORS

Jeremy Berg, PhD

Terence Dermody, MD

Alda Maria Gonzaga, MD '00, MS '06

Mische Holland (PhD student)

Ruby Holland (MD/PhD student)

Naudia Jonassaint, MD, MHS, MBA

Michelle Lynskey (PhD student)

Mylynda Massart, MD, PhD

Margaret C. McDonald, PhD, MFA

Joseph Mocharnuk (Class of '25)

Gnankang Sarah Napoe, MD '12

Evelyn Reis, MD

Peter Strick, PhD

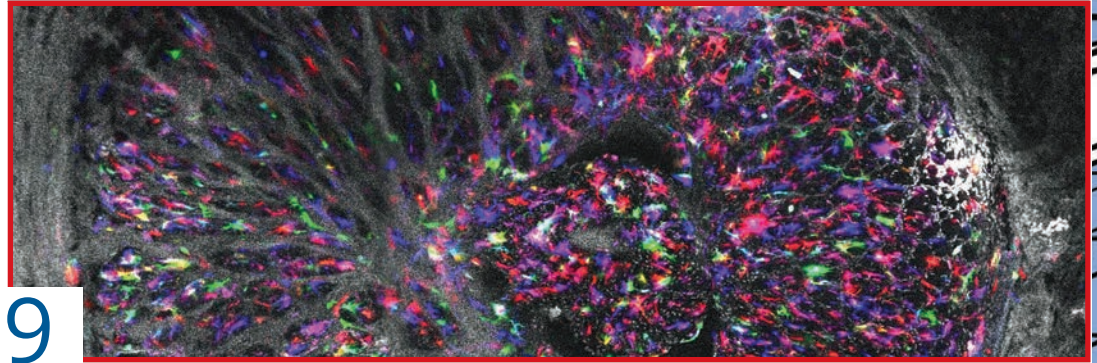
Ann Thompson, MD, MCCM

Bennett Van Houten, PhD

Simon Watkins, PhD

EX OFFICIO

Leeanna McKibben, DHA, MSN, RN



These star-shaped cells help maintain neuronal health. When stressed, they are less stellar in that role.

DEPARTMENTS

OF NOTE 4

Sports brain bank will offer new insight on traumatic brain injuries.

Cells don't really work like machines.

Chris Keenan lives his pipe dream.

Training with the Steelers.

Guiding stars of our cellular cosmos.

INVESTIGATIONS 10

Drop in the cellular bucket.

Seen, heard, supported—help for

teens facing violence.

Your friendly neighborhood

cancer killers.

ATTENDING 14

Lasting impressions at the Salk legacy exhibit.

ALUMNI NEWS 34

Science-free symposium addresses life's concerns.

The Browns were doctors at an unlikely time.

RIP: Stewart Sell.

FOR REAL! 40

Hey kids! Some surgeons use extreme cold so their patients feel less pain.

How cool is that?



ABOUT THE COVER National studies show that by their third year, med students are more likely than their contemporaries are to experience depression and burnout. Pitt Med has recruited the personal physician to the Dalai Lama as part of its efforts to help students cultivate equanimity. (Illustration: Michael Hirshon, © 2023.) Pitt Med is published by the Office of the Dean and Senior Vice Chancellor for the Health Sciences and produced quarterly for alumni, students, staff, faculty and friends of the School of Medicine.

The University of Pittsburgh is an affirmative action, equal opportunity institution. © 2023 University of Pittsburgh.



“We hire our best students to combine product design, mechanical engineering, bioengineering and chemistry to build prototypes.”



FEATURES

Ideas to reality

This corps of student engineers works with physicians to improve care.

**COMIC BY ATHENA CURRIER
AND KATY RANK LEV**

17

Within our orbit

Cross-disciplinary research thrives at Pitt.

**FOLLOW-UP BY MARCELA M. GOMEZ
AND ANDREW DOERFLER**

24

Cultivating equanimity

The immense pressures of med school needn't lead to burnout. Pitt Med students learn to attend to their minds so they can attend to their studies and their patients.

COVER STORY BY ERICA LLOYD

26

No judgment, Cures for put-downs, and more

Words of wisdom for healers from the 14th Dalai Lama and others on the rewards of building clarity, humility and compassion.

**FOLLOW-UPS BY BARRY KERZIN
AND ERICA LLOYD**

30

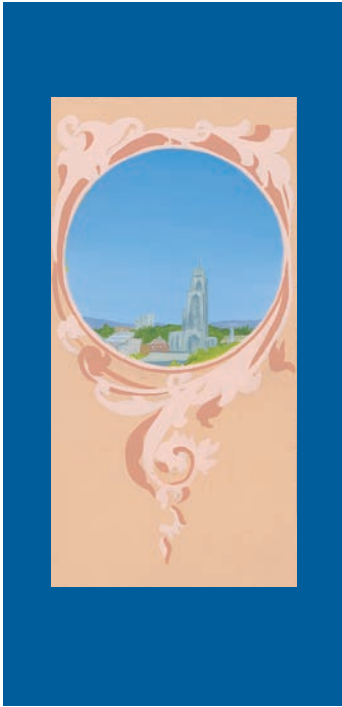
CONTRIBUTORS

KATY RANK LEV ["Ideas to reality"] first wrote for this magazine when she began her MFA in creative nonfiction at Pitt in 2005. Her freelance work has since appeared in publications such as BUST and DAME; she particularly enjoys covering women's health. Rank Lev, who has written 23 novels under a pen name, is faculty in Pitt's Department of English and teaches an interdisciplinary course with the Swanson School of Engineering. Of the IDEA Lab comic journalism story she penned for us, she says, "I love the way engineers' creativity dovetails with the knowledge of the doctors who are involved."

ROBERTA ZEFF ["Training days" and other stories] began her career at the Pittsburgh Post-Gazette and Detroit Free Press before spending nearly 27 years at The New York Times, most recently as senior staff editor for the Well section. At the Times, she produced two popular series, "Ties" and "The End." The latter focused on end-of-life issues and catalyzed her passion for health journalism. Now back in Pittsburgh as a senior editor and writer for Pitt health sciences, Zeff appreciates her interactions with med students like Warren Austin: "They are inspiring and enthusiastic and proud of what they're learning to do."

OF NOTE

*Devoted to noteworthy happenings
at the medical school*



Julia Kofler leads a longitudinal study assessing risks that contact sports present to the brain.

JOHNATHAN WRIGHT/UNIVERSITY OF PITTSBURGH

Levine's legacy on display

From a distance, the globe-shaped sculpture on the fourth floor of the new West Wing of Alan Magee Scaife Hall resembles a child's construction toy—its silvery, gear-shaped panels seem to float around a red flower blooming within.

Up close, it's a tribute to Arthur S. Levine, an MD and Distinguished University Professor, who was the John and Gertrude Petersen Dean of the School of Medicine and senior vice chancellor for the health sciences from 1998 through 2020. In that role, Levine helped elevate the prominence of the School of Medicine and the health sciences. Among his many lasting contributions, he oversaw the creation of 10 academic departments and 10 major centers and institutes, including the Brain Institute, where he serves as executive director.

"This symbolizes our respect, recognition and gratitude for everything Arthur Levine has done," Levine's successor, Dean Anantha Shekhar, an MD, PhD, said at the unveiling of the sculpture on Sept. 13.

The sculpture, "Glimpses of Genes Through a Virus," is based on Levine's research on simian virus 40. "This was one of the earliest demonstrations of how a virus can cause cancer," Levine explained. The sculptor, Byron Rubin, is a scientist.

"It is intended to represent Dr. Levine's deep and broad interests in science, from the most fundamental to aspects directly applicable to human health, from which Pitt benefited so tremendously," says Jeremy Berg, PhD associate senior vice chancellor for science strategy and planning in the health sciences. —Roberta Zeff



SPORTS BRAIN BANK SCORES STAR DONORS

Neuroscientists in years to come will be able to learn not only from renowned neurosurgeons Joseph Maroon and Regis Haid, but from former Steelers running backs Jerome Bettis and Merrill Hoge. All have pledged to donate their brains to the University of Pittsburgh's National Sports Brain Bank (NSBB). Both a brain donation registry and novel longitudinal observational study, the NSBB aims to improve understanding of the neurodegenerative processes after traumatic brain injury.

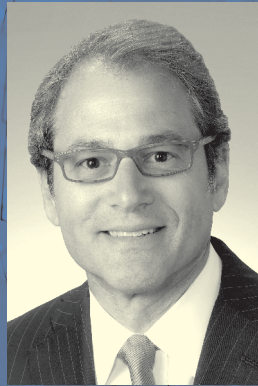
Maroon, an MD clinical professor of neurological surgery at Pitt who played football at Indiana University, says that while many papers have suggested concussions and subconcussive blows lead to permanent brain damage, unanswered questions remain. This is in part because diagnosing and analyzing data from these diseases is currently only possible through an autopsy.

The NSBB is changing the way such data are collected by tracking and studying participants over their lifetimes. The process will fill in the gaps by having each patient and a study partner, someone who knows them well and interacts with them regularly, answer questions about how their condition changes over time.

PHOTO LEFT: JOHN AUDOBERN



Flynn



Morell



Roth

Frederick P. (Fritz) Roth

has joined the School of Medicine as professor and chair of the Department of Computational and Systems Biology. Roth is a PhD known worldwide for his work

New chairs named

JoAnne L. Flynn, a PhD, is now chair of the Department of Microbiology and Molecular Genetics. She is an international expert in the field of tuberculosis and infectious disease immunology who has led the department on an interim basis since Thomas Smithgall, the William McEllroy Professor, retired from the position in December 2022.

Flynn has been studying tuberculosis, a disease that kills 1.5 million people annually, for almost 35 years. She has made seminal discoveries that illuminate the roles of various aspects of the immune response against *Mycobacterium tuberculosis*. Since 2015, Flynn has also served as assistant dean for the Medical Scientist Training Program, as well as codirector of the University of Pittsburgh–Carnegie Mellon University Medical Scientist Training Program.

Victor O. Morell

has been appointed chair of the Department of Cardiothoracic Surgery. Morell is an MD and the Eugene S. Wiener Professor of Pediatric Cardiothoracic Surgery. He also serves as director of cardiovascular services and is surgeon-in-chief of UPMC Children’s Hospital of Pittsburgh.

A highly accomplished teacher, mentor, scientist, administrator and surgeon, Morell is chief of pediatric cardiothoracic surgery at Children’s. His current research interests include transposition of the great arteries, extracorporeal membrane oxygenation as a bridge to cardiothoracic transplantation in pediatric patients and congenital cardiac surgery education. He succeeds James D. Luketich, the Henry T. Bahnsen Professor of Cardiothoracic Surgery.

in computational biology and genomics. He will also lead the development of the school’s institutional computational genomic strategy.

Since 2011, Roth has held joint appointments as professor of molecular genetics and computer science at the University of Toronto’s Donnelly Centre for Cellular and Biomolecular Research and senior investigator at Sinai Health System’s Lunenfeld-Tanenbaum Research Institute (LTRI), also in Toronto. His research team carries out computational and experimental genomics research and pursues technology development through fundamental discovery and clinical applications. The department was most recently led on an interim basis by Jeremy Berg, associate senior vice chancellor for science strategy and planning for the health sciences, after founding chair Ivet Bahar led the department for 18 years. —*Staff reports*

NSBB Director Julia Kofler, an MD associate professor of pathology, hopes this approach will eventually ensure the safety of those participating in sports and clarify why some are more vulnerable than others to neurodegenerative processes. “We would like to provide answers so that people can make an informed decision about what the risks are with individual sports,” Kofler says.

Donations to the NSBB will merge with the existing collection of more than 2,000 specimens in Pitt’s Neurodegenerative Brain Bank. The de-identified data and samples gathered will be shared with the broader research community. Participation in the NSBB is open to any adult who has participated in a variety of sports at all levels of play (Haid also played contact sports in college), served in the military or had a concussion from another cause.

The brain bank’s launch was supported by funding from the Chuck Noll Foundation for Brain Injury Research, the Richard King Mellon Foundation and The Pittsburgh Foundation. Sam Reiman, director of the Richard King Mellon Foundation, calls the NSBB “another example of Pitt and Pittsburgh stepping up to serve as national leaders in important work.” —*Nicole Matthews*

SEN LEADS MCGOWAN INSTITUTE

Chandan K. Sen, a PhD and MS who joined the University of Pittsburgh in July 2023, has been named director of McGowan Institute for Regenerative Medicine. He succeeds William R. Wagner, a PhD Distinguished Professor of Surgery with appointments in bioengineering and chemical and petroleum engineering, who led the institute for 12 years and has 50 patents. Sen also serves as associate vice chancellor for life sciences innovation and commercialization for Pitt Health Sciences and as professor of surgery with a secondary appointment in plastic surgery.

Sen’s research focuses on the use of nanotechnology for tissue regeneration. Among many breakthroughs, his team built a nanochip device that can noninvasively reprogram one type of tissue so that it functions like another type of tissue. He will lead the Pennsylvania clinical research unit of the National Institute of Diabetes and Digestive and Kidney Diseases–sponsored Diabetic Foot Consortium.

—*Staff reports*



Sen

Warren Austin got a firsthand look at sports medicine during a clinical rotation at the Steelers' training camp.



TRAINING DAYS

For many Steelers fans, a player's injury at training camp in August was cause for concern. For Warren Austin, a third-year medical student and 2019 Pitt graduate, each injury also represented a learning opportunity.

Austin, who grew up in Carrick, spent August in a clinical rotation with the team as the first local participant in the NFL's Diversity in Sports Medicine Pipeline Initiative, developed to encourage medical students from diverse backgrounds to consider careers in sports medicine. The league cited a 2021 report published in the *New England Journal of Medicine*, which found that Black students accounted for 7.3% of the total med school population in the United States, well below the 13.4% Black population overall.

After learning of the program through the Office of Diversity Programs at Pitt Med, Austin consulted his mentor, MaCalus V. Hogan, the David Silver Professor of Orthopaedic Surgery and chair of that department, who is also a foot and ankle consultant to the Steelers.

"Everyone deserves exposure to opportunity, particularly those who are working hard and excelling and have a goal in life. And Warren Austin fits those criteria," says Hogan, an MD, who noted that the program strengthens the partnership the Steelers already have with Pitt's School of Medicine.

Austin started in Latrobe at the Steelers' camp with the athletic training staff at Saint Vincent College and then moved into the clinic at the UPMC Rooney Sports Complex with sports physicians.

Austin, who attended Pittsburgh's Central Catholic High School, spent two summers during high school with his uncle, an ob/gyn at a hospital in rural Indiana, and shadowed his uncle's colleagues who practice a range of specialties. "I saw how medicine can change somebody's day-to-day life, whether it be restoring their mobility or curing them from an illness," he says.

Working with Aaron Mares, an MD and the head team primary care sports medicine physician for the Steelers, "opened my eyes to another side of sports medicine," Austin says. He was drawn to the way that sports physicians go beyond orthopaedic injuries to treat other issues that may affect a player's performance.

He adds, "As a representative of Pitt Medicine, I wanted to leave a good impression on the team, as someone willing to learn and willing to help." —*Roberta Zeff*

Next gen

When **Anna Li**'s family emigrated from China to the United States with only \$20 in cash, they did it so that she could have a future. Today, she's the University's first-ever recipient of the Paul and Daisy Soros Fellowships for New Americans, an annual award that provides \$90,000 throughout two years to immigrants and first-generation students pursuing graduate education.

Li, who is pursuing an MD/PhD at Pitt with a focus on treating antibiotic-resistant infections in cystic fibrosis patients, is among 30 recipients in the 2023 class of fellows, who were selected out of nearly 2,000 applicants.

In addition to her studies, Li is the founder and CEO of Korion Health, a startup developing an electronic stethoscope and app that allow patients to accurately monitor their vitals at home and relay that information to their doctor.



Li

Rising third-year medical student **Stephen C. Frederico** received a Medical Scholars Research Fellowship from the Physician-Scientist Support Foundation. Frederico is using his fellowship, which comes with a \$50,000 prize, to support a year of funded brain tumor research at Dana-Farber Cancer Institute in Boston.



Frederico

Frederico's career path came into view when, shortly before college, he lost a close friend to diffuse midline glioma (DMG), a highly aggressive brain tumor that predominantly affects children; the average survival rate is 11 months or less. Researchers at Dana-Farber have biopsied DMG tumors in children and found a specific target to inhibit the cancer, using a small molecule inhibitor. Frederico has joined their efforts.

Since arriving in Boston over the summer, he has decided to pursue a master's degree in clinical investigation at Harvard University. His work at the Dana-Farber lab seems promising for finding a new drug therapy for treatment-resistant tumors, which will form his master's thesis. —*Micaela Corn*

KARL ROSEN/PITTSBURGH STEELERS

Clifford Brangwynne's work launched the field of biomolecular condensates, which is opening new avenues for treating Alzheimer's and other diseases.

COURTESY BRANGWYNNE



Overheard Cells don't really work like machines, Dickson Prize winner says.

When **Clifford Brangwynne**, a PhD, first identified that biomolecules like proteins could form condensates within cells—in the same way that oil forms droplets in water—it didn't make a huge splash. The finding was met with healthy skepticism from many who questioned whether those droplets could actually play a role in cell function.

But in the decade since, contributions by researchers from a range of disciplines have turned the study of biomolecular condensates into a field unto itself. Scientists now hope this new way of thinking of cellular organization will allow them to develop therapeutics for protein aggregation diseases like Alzheimer's and cancers that are driven by mutations. (See page 10 to learn how Pitt researchers are advancing the field.)

Recognizing this shift, the School of Medicine this year awarded its highest honor, the Dickson Prize in Medicine, to Brangwynne, the June K. Wu '92 Professor of Engineering at Princeton University. He gave his Dickson Prize in Medicine Lecture in May 2023.

What advantage did your background in materials science give you in studying cell biology?

If we're all doing the same exact thing, we all have the same exact training, we have the same backgrounds, then we're going to essentially come to the same conclusions. Often the most interesting advances in science and technology and entrepreneurship and all areas of impact are happening at interfaces between traditionally separate disciplines. In my case, it was between soft condensed matter physics and cell biology. The interface between them became a very interesting place, simply because some of the questions that one would ask very standardly within materials physics hadn't been asked in biology.

How does this work challenge the understanding of what's going on within cells?

The notion from the textbook pictures that we draw on, that are in all the students' heads, is that [a cell] is like a timepiece or a clock or a car: It's got these interlocking parts, and this one moves, and that one moves, and then the machine works. The problem is, those pictures start to inform, in a more fundamental way, how we view the cell. If the cell is a type of machine, it's a much more wet, squishy, dynamic and complex machine than any of those pictures would suggest.

A typical protein in your cell is rotating around at about a million times a second and interacting with hundreds of thousands of binding partners. There's no machine that we know of that operates quite like that. What's exciting about the biomolecular condensate field and the idea of phase transitions as an organizational principle—it's fundamentally a new way of thinking about how the cell can work and [organize] in coherent order.

What does it mean to you to have your work recognized with the Dickson Prize in Medicine?

We're starting to see therapeutics move toward the clinic, and to see drugs that are going to have an impact on diseases that are really devastating. I'm really thrilled that we're at a point where the medical field sees the value and potential of these fundamental advances.

I was an undergraduate at Carnegie Mellon University. And so to come back to Pittsburgh, to receive this recognition from the University of Pittsburgh medical school, was also really meaningful to me.

—Interview by Andrew Doerfler. Comments have been condensed and edited for clarity.

Listen to the Pitt Medcast at pittmed.pitt.edu/podcasts.



Berg



Buranosky



Opresko

Women of distinction

In 2021, JoAnne Flynn, Distinguished Professor of Microbiology and Molecular Genetics and now chair of that department, looked into the demographics of the School of Medicine's endowed chairs, highly sought-after positions that offer distinction and stable support for top faculty. Out of 84 of these chairs, Flynn found, only 13 were held by women. Yet women make up 44% of the faculty.

Flynn and colleagues, who had formed a task force, met with Dean Anantha Shekhar to discuss their findings; and he committed to expanding leadership opportunities and support for women faculty. Since then, the school has named three more women as endowed professors.

Patricia Opresko, a PhD and leading telomere researcher, is the Dr. Bernard F. Fisher Professor of Breast Cancer Discovery Science. Opresko also serves as

coleader of the Genome Stability Program at the UPMC Hillman Cancer Center.

Wendie Berg, an MD, PhD admired for her work optimizing breast cancer screening technologies, is the Dr. Bernard F. Fisher Professor of Breast Cancer Clinical Science. She works to improve breast cancer detection in women who have a history of breast cancer or dense breast tissue.

Raquel Buranosky, an MD, MPH known for her work in women's health and curriculum development, is the Dr. Leo H. Crip Professor in Patient Experience. Nationally regarded for her work in medical education, she is also the associate dean for clinical education in the Office of Medical Education.

Says Flynn, "[Dean Shekhar] is committed to raising the profile of women. And so far, I have to say, he's doing a good job." —NM

Pipe dreams

Second-year student Chris Keenan was already an expert in organs before he got to med school.

Keenan started playing the pipe organ as a teenager at the Nashville-area church where he and his dad sang in the choir. It quickly became a passion, and he went on to Peabody Institute, the conservatory at Johns Hopkins University, before eventually earning a doctorate in organ at the University of Texas at Austin. Studying under an Austrian professor, Keenan nurtured a love of German Baroque composers.

But a new calling took hold as he moved around the country for full-time music jobs and traveled to Europe for recitals. He started spending his off hours as an EMT and later became a part-time firefighter, working closely with a team of fellow emergency personnel.

"Music can be pretty solitary, practicing alone all day," he says, "especially for an organist, since we're not in an orchestra."

He also found the lifesaving work rewarding. Keenan soon made the leap to med school—but he hasn't left the keys, pedals and pipes behind.

In 2023, he has played recitals at the famed St. Thomas Church in Midtown Manhattan, Pittsburgh's St. Paul Cathedral in Oakland and

Chris Keenan balances music and medicine.



COURTESY KEENAN

Westminster Presbyterian Church in Upper St. Clair. He returned to his native Tennessee for concerts by a choir he started there. And he maintains a part-time position as music director and organist at Mt. Lebanon Lutheran Church.

Keenan is happy to focus on the things he loves about music, rather than letting it dictate his life. "Now I just want to find beautiful spaces that are worth playing."

The 247-foot-tall, two-spired Gothic Revival cathedral at St. Paul fit the bill—and it's home to a towering 5,000-pipe Beckerath organ from Hamburg, Germany. In July, Keenan filled the cavernous worship area with favorite pieces by Johann Sebastian Bach, Dietrich Buxtehude and Eugène Gigout in a performance recorded by WQED. —AD

FOOTNOTE

Mt. Oliver's revitalization is brewing, with help from Jörg Gerlach, professor of surgery and of bioengineering at Pitt, and his husband, James Tyler. Tyler opened the ECHT Coffeehouse there last year, serving up artisanal food and coffee in a setting adorned with metalwork made in a shop of associated craftsmen on site. (Echt is a German word for "authentic" or "genuine.") As ECHT grows with new culinary offerings, Gerlach stays creative at Pitt, developing

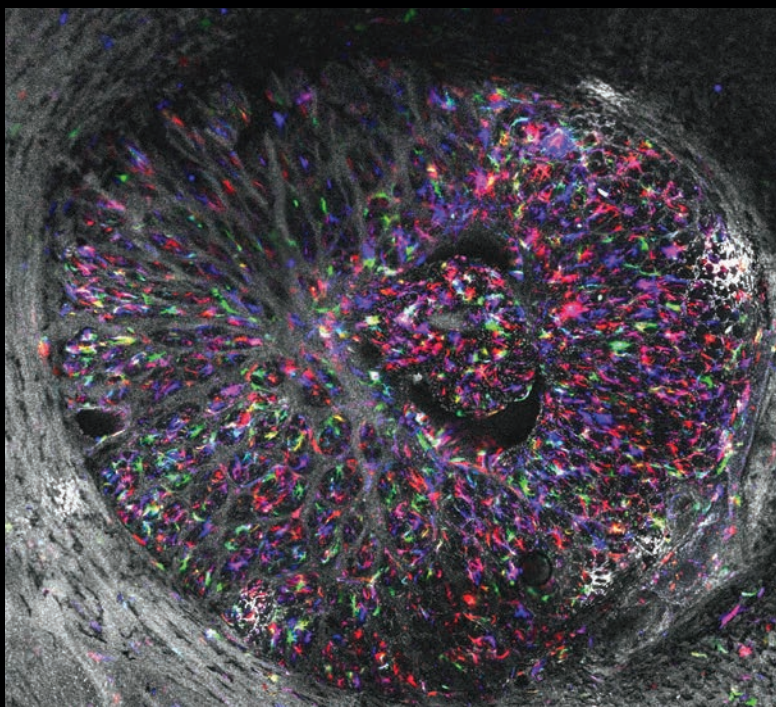
next-generation "skin gun" technologies to restore damaged tissue, devising new approaches for extracorporeal organ support and better preserving transplantation organs.



Seeing stars

Cells known as astrocytes could be considered stars of the brain's cellular cosmos. These star-shaped bodies help maintain neuronal health by regulating nutrients and directing the chemical messages neurons use to communicate. When stressed, astrocytes are less stellar in that role—yet they can signal the early progression of neurodegenerative diseases. Better understanding the cells' connections to neurodegeneration could help scientists chart courses for new approaches to care, and even prevention. —*Phoebe Ingraham Renda*

EYE ASTROCYTE IMAGE: REPRINTED FROM EXPERIMENTAL EYE RESEARCH, VOL. 230, INDIVIDUAL ASTROCYTE MORPHOLOGY IN THE COLLAGENOUS LAMINA CRIBROSA REVEALED BY MULTICOLOR DIOLISTIC LABELING, S. WAXMAN ET AL., 2023, WITH PERMISSION FROM ELSEVIER.



IN GLAUCOMA

On the neurological bridge between the eye and the brain, glaucoma can take hold. That's where scientists have noticed astrocyte reactivity and changes in shape that correlate with the disease's progressive vision loss.

"We know that these changes in astrocyte morphology can be detected before any [observable] neurodegeneration sets in," Susannah Waxman, a doctoral student in the Laboratory of Ocular Biomechanics at Pitt, explains in a recent UPMC blog. However, identifying the specific shapes, twists and bends correlating with disease outside of rodent models has been largely limited to examining astrocyte cytoskeletons—which Waxman describes as "a lot like imagining what dinosaurs looked like based on what paleontologists know of their bones."

To push past this limitation—with direction from Ian Sigal, a PhD associate professor of ophthalmology and of bioengineering and principal investigator—Waxman and colleagues from Pitt and Harvard University are using high resolution images to build 3D models of astrocytes.

Their work reveals previously unseen structural details (see left) of astrocytes that illuminate their size, shape and complexity, as well as their spatial relationships with their neighbors.

(Image: *Experimental Eye Research.*)

IN ALZHEIMER'S

Astrocytes are "a new frontier explored in Alzheimer's disease," says Tharick Pascoal, an MD, PhD associate professor of psychiatry and neurology.

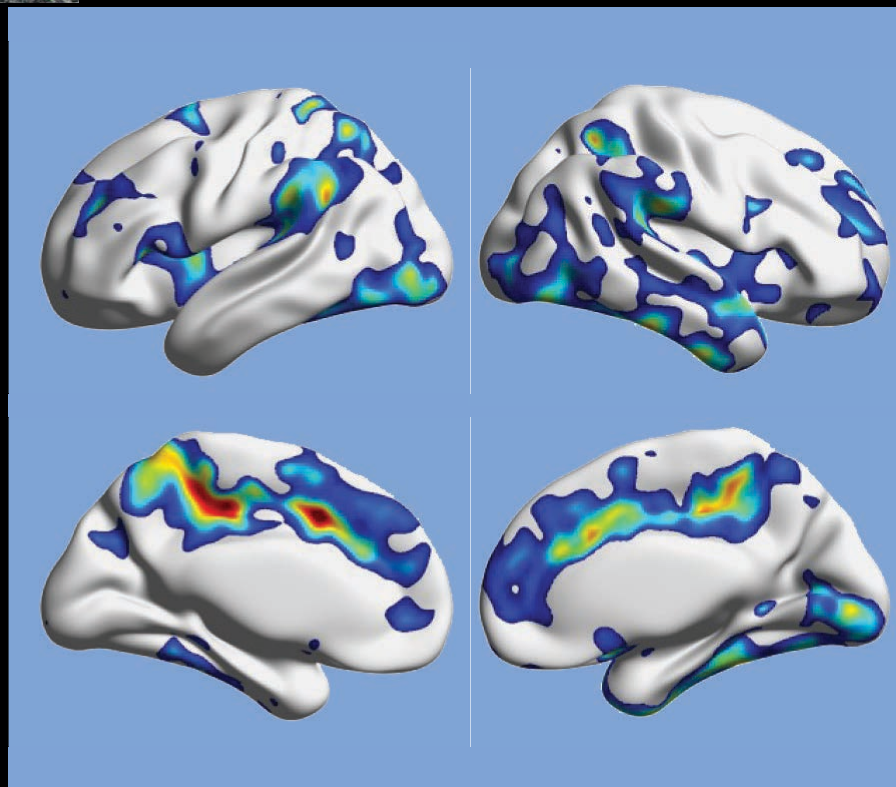
In a study published in *Nature Medicine*, postdoctoral researcher Bruna Bellaver of Pascoal's lab and collaborators demonstrated that biological signs of astrocyte reactivity can be used to identify, track and understand the progression of Alzheimer's. Pascoal and fellow Pitt psychiatry faculty Victor Villemagne, an MD, and Thomas Karikari, a PhD, are also authors on the study.

When astrocytes become stressed and reactive (changing in shape, gene expression and function) amid preclinical pathological changes in the brain, they release high levels of a protein (glial fibrillary acidic protein or GFAP), which can be detected in blood. As their reactivity persists, they lose their ability to support neuronal health.

The study found that abnormal levels of GFAP in blood samples from people without cognitive impairments indicated the onset of astrocyte reactivity, which correlated with neuronal dysfunction in the brain over time. Those protein levels also rose alongside the accumulation of amyloid-beta and phosphorylated tau proteins—precursors to clinical symptoms in Alzheimer's.

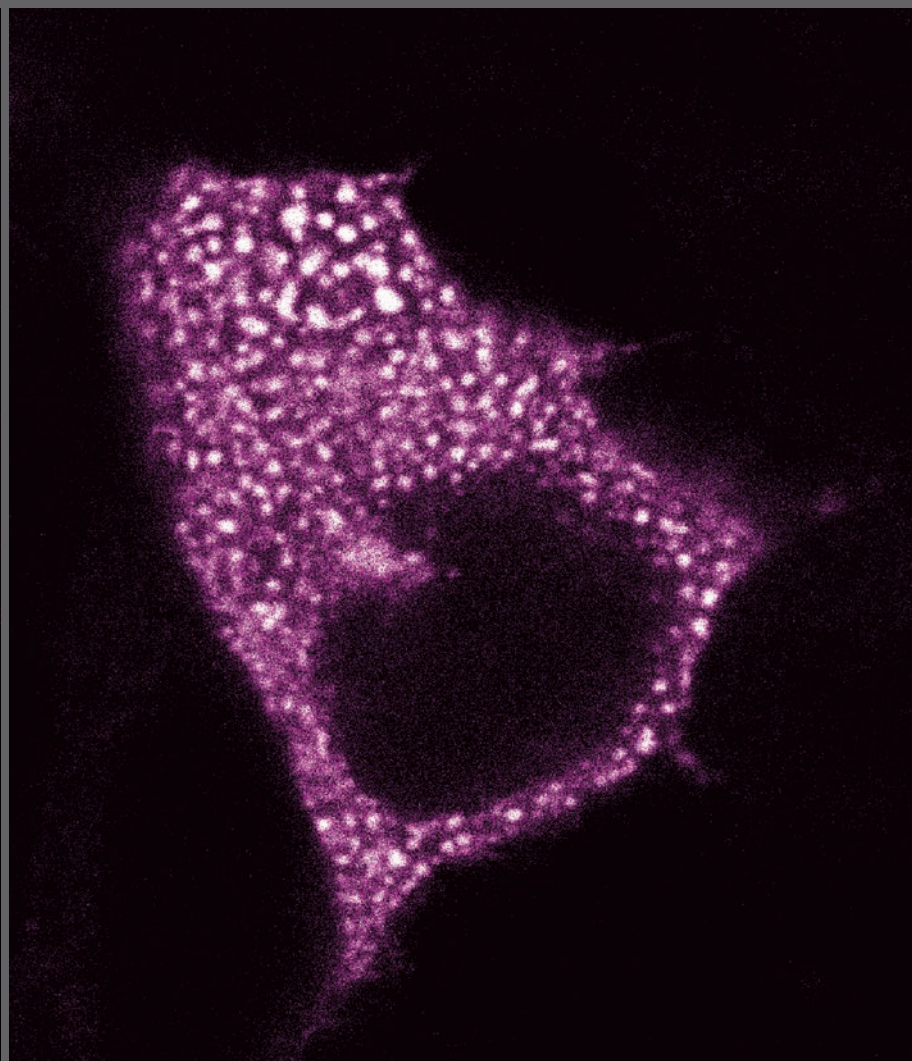
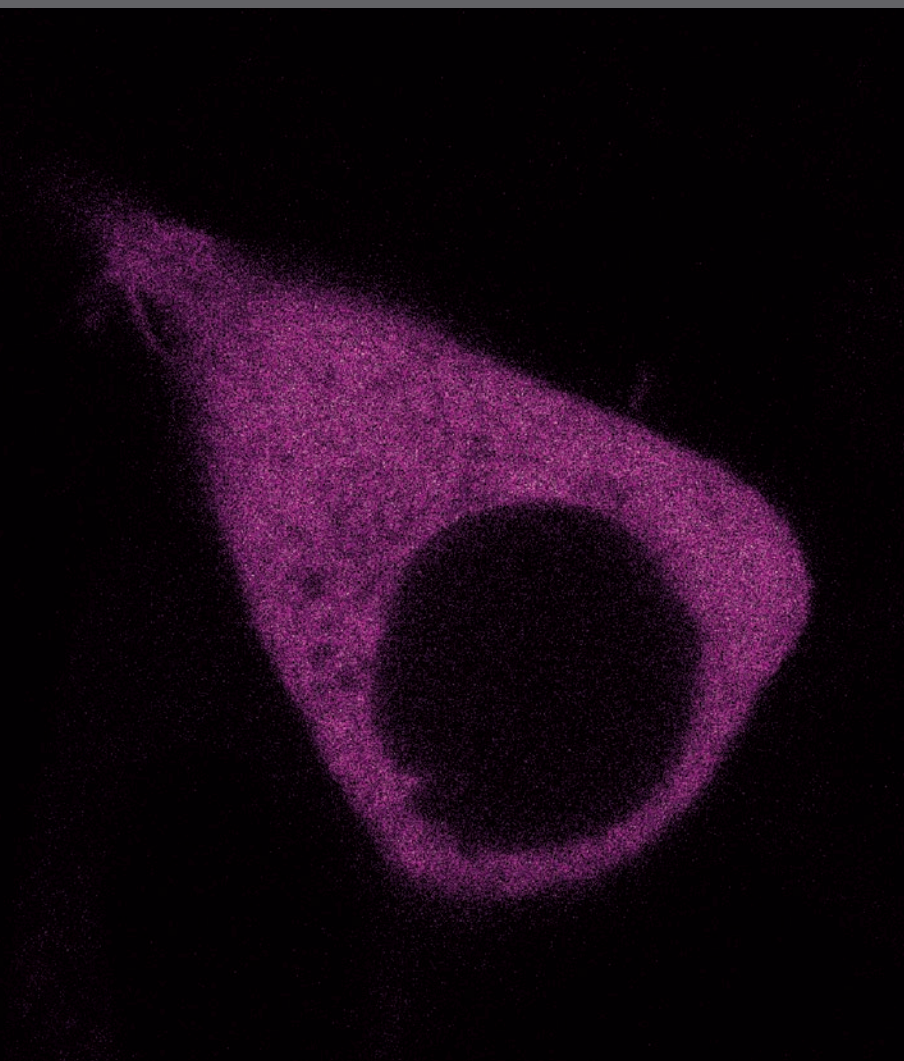
"Astrocytes might be like a maestro in an orchestra guiding the musicians that are amyloid, tau and all the other cells into the disease pathway or health pathway," Bellaver explains.

(Right: Associations between amyloid and tau pathology—red means more—in the brains of cognitively normal people with reactive astrocytes. Image: *Nature Medicine.*)



INVESTIGATIONS

Explorations and revelations



When a cell is stressed by a salt solution, the WNK1 protein (fluorescently tagged in these images) goes from being spread diffusely throughout the cytoplasm to concentrating into droplets with liquid-like properties. The process helps cells sense crowding and regain volume. Researchers are anxious to see if their findings will translate to what happens in the kidney.

DROP IN THE CELLULAR BUCKET

BIOMOLECULAR CONDENSATES COULD BE KEY TO CELL FUNCTIONS AND DYSFUNCTIONS

BY ANDREW DOERFLER

Cells are the basic building blocks of life, but many of their inner workings remain a mystery.

For a long time, researchers mostly linked cell functions to membrane-bound organelles that handle important tasks—think mitochondria, lysosomes and the other cellular actors that many of us first saw in biology textbooks. But these conveniently cordoned-off pieces don't account for everything that happens—or can go wrong—in a cell.

In the last decade, researchers have noticed a phenomenon that could fill in some of the gaps. Swirling around in the cytoplasm, biomolecules such as proteins can join together in liquid-like droplets, just as oils separate into droplets in water.

These membraneless “biomolecular condensates,” formed through a process called liquid-liquid phase separation, offer a new layer to scientists' thinking about how cells are organized. And Pitt researchers are finding evidence of the protein-packed droplets' role in a range of cell functions and dysfunctions, as in neurodegenerative diseases like amyotrophic lateral sclerosis (ALS).

“It's a way to compartmentalize proteins and biomolecules so that they can coordinate and do a job in a little liquid-like network,” says Chris Donnelly, a PhD assistant professor of neurobiology and scientific director of

the LiveLikeLou Center for ALS Research. “What we found, and what people have been finding, is that the process can go awry.”

In about 97% of ALS cases, the patients' cells have toxic clumps of a protein called TDP-43. Usually, TDP-43 binds with RNA as part of a number of normal, healthy processes. Issues arise when it instead binds too much with itself. Donnelly's team has found that this starts with an aberrant liquid-liquid phase separation, with condensates of TDP-43 eventually solidifying.

Scientists don't yet know whether TDP-43 is involved in causing ALS, but disrupting the buildup may still offer a way to treat symptoms. Donnelly and his collaborators have started a company called Confluence Therapeutics to develop synthetic nucleic acids that bind with the protein to prevent the abnormal phase separation or break up aggregates.

Enthusiasm about biomolecular condensates' potential has been building. Pitt's School of Medicine recently awarded its highest honor, the Dickson Prize, to Clifford Brangwynne, a Princeton University bioengineer whose work launched the field (see page 7).

Thanks in part to his background in materials science, Brangwynne recognized that phase separation—a well-established process in non-living matter—could also happen in cells. The idea didn't catch on right away.

Carlos Camacho, a PhD associate professor of computational and systems biology, says his background in physics initially made him skeptical that liquid-liquid phase separation was relevant in biology. But after learning more and conducting experiments of his own, he became intrigued by the ways that condensates may allow disordered proteins to regulate the signals that cells send to coordinate function.

Some scientists still aren't convinced. But in a study published in 2022 in the journal *Cell*, kidney researchers from Pitt and Carnegie Mellon University made one of the first clear links between condensates and cell function—and solved a longstanding mystery.

High levels of stressors, like salt or sugar, can cause a cell's volume to decrease. Scientists long believed the cells regained their volume by somehow sensing crowding within the cell. Further research suggested an enzyme called with-no-lysine kinases, or “WNKs,”

reversed cell shrinkage, but how remained unclear.

That changed after some unexpected observations made in 2016 under a microscope by Cary Boyd-Shiwarski, an MD, PhD and assistant professor of medicine in the Division of Renal-Electrolyte, and Daniel Shiwarski, a PhD assistant professor of bioengineering and medicine who was at the time a Carnegie Mellon postdoc. (The Shiwarskis are married.)

When they added a salt solution to a sample of cells, causing them to shrink, fluorescently tagged WNKs condensed into droplets, along with the molecules that activate the cells' salt transporters. The phase separation allowed the cell to import both ions and water, quickly restoring the cell's volume.

Arohan R. Subramanya, senior author on the study, is now eager to tie their findings back to the kidney. When potassium levels are low in the blood, WNK-dependent condensates (which the researchers call WNK bodies) form in the kidney tubule. “All of our evidence to date indicates that WNK bodies are important for controlling salt transport, potassium balance and blood pressure,” says Subramanya, an MD associate professor of medicine.

Camacho, Donnelly and Subramanya are all part of Pitt's Center for Protein Conformational Diseases. There, collaborations are brewing to find even more ways that condensates are involved in diseases that involve irregular protein formations.

Says Boyd-Shiwarski, “There's a lot of potential for this to be involved in more reactions and processes within the cell than we can even fathom at this point.” ■



Boyd-Shiwarski



Shiwarski



Donnelly



SEEN, HEARD AND SUPPORTED

A NEW PROGRAM STRENGTHENS SUPPORT SYSTEMS FOR TEENS FACING VIOLENCE

BY ANDREW DOERFLER

GETTY IMAGES

Early in medical school, Alison Culyba worked at a Philadelphia shelter and service provider for young adults with nowhere, or no reliable place, to live. She was struck by the resilience they displayed in the face of violence:



Culyba

“I knew that I wanted to pursue a career focused on violence prevention through this lens of strength and resilience, focusing on all of the talents, gifts and assets that young people bring to the table.”

Now an MD, PhD, MPH assistant professor of pediatrics, public health, and clinical and translational science at Pitt, Culyba works with community members and partner organizations to support Pittsburgh’s young people amid rising rates of youth violence.

In her research, she has mapped the support networks of youth who’ve experienced violence. She’s found that strong relationships with family members, teachers, mentors and other adults help teens navigate the challenging situations they encounter. “It’s one of these key cross-cutting factors that protects against almost everything you can imagine in terms of adolescent health, including exposure to violence,” she says.

Culyba and her partners are putting those findings into action. This year, they launched a pilot of an intervention program called Strengthening Connections for Change (SCC), supported by a Career Development

Award from the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

The program not only introduces young people to strategies and resources available to them, it also helps them build a cache of reliable relationships that they can tap into amid the burden of violence around them. The pilot ran in the East Liberty and Knoxville neighborhoods, with two 12-week sessions in each.

Over the course of the program, community facilitators guided the teenagers’ participation. “Some of the things that they’ve seen and experienced, we’ve seen and experienced,” says April Jones. She’s an SCC facilitator in East Liberty, where the program partners with the Family and Friends Initiative and the UPMC Center for Engagement and Inclusion to host sessions at the UPMC Health Plan Neighborhood Center.

Michelle Lewis, another East Liberty facilitator, finds that young people usually come in without a strong sense of who they can turn to in times of trouble. However, “when they start writing it down, seeing it on paper, they start to realize the connections,” she says. Of course, the results are different for everyone.

“There isn’t one ‘right way’ for networks to look,” Culyba says. What matters, she says, is a diversity of types of connections.

During sessions, participants also role-play challenging scenarios and hash out strategies to handle them. Midway through the program,

trusted adults the teens have identified join the sessions. “Supporting the supporters,” Culyba says, is key to success. Some teens don’t have anyone like this in their lives—so SCC invites mentors from churches and community groups to fill the need.

Culyba and her team will now dig into surveys to find how the program might affect participant violence perpetration and victimization, attitudes toward violence, coping mechanisms and more.

But Lewis says she saw the benefits firsthand, as teens opened up as the program went on. She recalls a participant and a mentor who’d met through the program cracking up in the corner as they got to know each other. “They were laughing so loud, I wanted to be over there!” she says. Later, the young man shared how much more confident he felt now that he had someone to turn to.

The pilot culminated with a celebration, where students “talked about their journeys, about their neighborhoods, about their visions for the future,” Culyba says. “It was incredibly inspiring to see their personal development.” Many spoke about the importance of churches and youth groups. For those interested, Culyba and her collaborators offer to connect the youth with other local initiatives to keep them moving forward in their journeys.

Stronger bonds between the teens and their communities benefit everyone, Lewis says. The isolation brought on by the COVID-19 pandemic, she has found, weakened many of the ties teens previously had; rebuilding them is urgent. “If we don’t have youth invested positively in our communities,” she says, “we don’t have a future.” ■



YOUR FRIENDLY NEIGHBORHOOD CANCER KILLERS

MACROPHAGES ARE TEAM PLAYERS IN
TINY TUMOR-FIGHTING COMMUNITIES

BY ELAINE VITONE

Tumor cells (magenta) are shown surrounded by immune cells, including the macrophages (red) found to play an important role in fighting estrogen-positive breast cancer.

Immune cells of various stripes have long been known to work together and even sub in for one another, in a pinch—pretty neighborly, you might say.

Recently, in a study of certain types of breast cancer, immune cells were spied not only acting neighborly, but putting down stakes together in cooperative little cancer-fighting “neighborhoods.” Cells called macrophages seemed to play an underappreciated role in many of these wee communities. That’s according to a *Nature Cancer* paper published in March by a team of investigators from the University of Pittsburgh and UPMC. If these insights bear out, they could point the way toward a new approach for drug development in certain tough-to-treat cancers.

It started about six years ago, when the paper’s first author, Sayali Onkar (PhD ’22), was embarking on a new research project, cocomentored by Pitt’s Steffi Oesterreich, a PhD and the Shear Family Foundation Professor in Breast Cancer Research, and Dario Vignali, a PhD, Distinguished Professor and chair of immunology. (Onkar graduated in December 2022 and is now a senior scientist at Mount Sinai Icahn School of Medicine.)

In some cancers, tumors respond well to immunotherapy, which leverages the body’s own immune response to thwart the disease. Unfortunately, Onkar explains, these drugs don’t work well for most breast cancers, especially those that are estrogen receptor–positive (ER+), meaning they need estrogen to grow. Most immunotherapy drugs work by boosting T cells, which ER+ breast cancers generally see much less action from, compared to

other kinds of breast cancer.

Oesterreich, Onkar and Vignali decided to dig deeper into other groups’ recent findings about the role of macrophages in ER+ tumors.

First, Onkar collected samples from patients with two subtypes of ER+ tumors, invasive ductal carcinoma (IDC) and invasive lobular carcinoma (ILC), with help from collaborators Priscilla McAuliffe, assistant professor of surgery, and Peter Lucas, professor and vice chair of pathology and professor of pediatrics.

Onkar then isolated, stained and analyzed the immune cells in each sample to come up with counts of a variety of immune cell types. She found that macrophages were, indeed, the clear frontrunners, especially in ILC.

Next, using expertise from the National Surgical Adjuvant Breast and Bowel Project, a clinical-trials cooperative, the team took a look at these tumor types in their environs—called the tumor microenvironment—with an eye on their immunological architecture.

“We realized the immune cells weren’t just scattered randomly,” says Onkar. “We started picking up certain patterns.” So they enlisted teams of biostatisticians and bioinformaticians led by Pitt’s Hatice Osmanbeyoglu and George Tseng, respectively. The researchers cataloged the neighborhoods into types, then compared those types to patients’ outcomes.

Some of these little locales, they found, seem to be better at tamping down tumors than others. That’s when the potential for a new, exciting avenue opened up.

Take, for example, a biological neighborhood associated with worse outcomes, says Oesterreich. “Maybe you can identify something they secrete, and block that, because that interaction inhibits killing of the tumor cells, right?”

In IDC, one kind of neighborhood was populated by macrophages that were cozying up to certain T cells (those famous cancer killers) and working in concert to result in better outcomes for patients. And in another kind of neighborhood, in ILC, macrophages were sending T cells packing. All told, the team identified seven distinct types of neighborhoods in IDC and ILC.

This study is just the latest among many from Oesterreich’s lab building the case that ER+ ILC and IDC, which are generally thrown into the same biomedical bucket, are actually very different. “By testing our hypothesis that IDC and ILC differ in their immune response, we can inform where we should focus attention for development of novel approaches,” Vignali says.

Next, the Pitt scientists aim to create animal models to study these neighborhoods in action. And at some point, Oesterreich says, they would love to explore another new realm: neighborhood maps meet the power of AI.

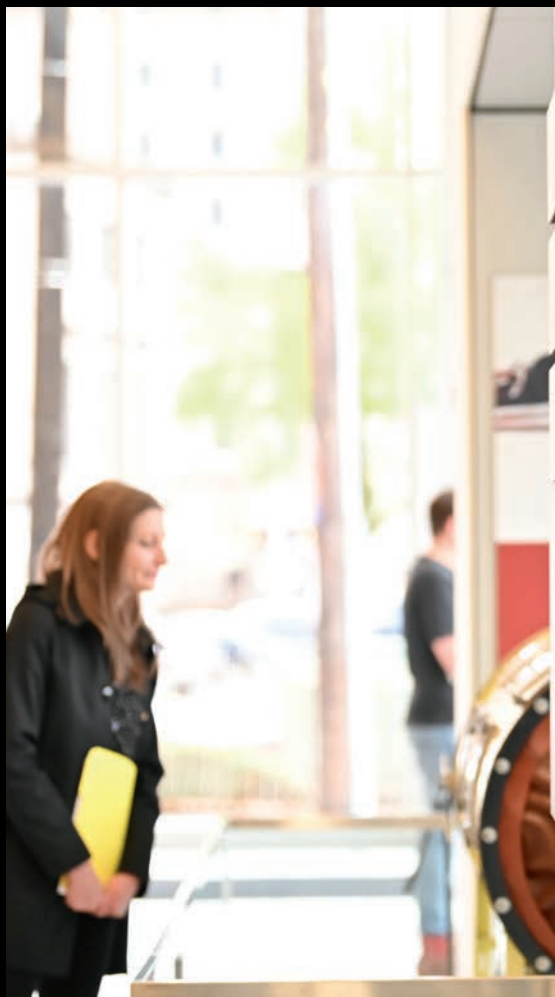
“Seeing if we can find patterns of how different tumor cells are spatially localized, and if that, potentially, is associated with unique responses to immune cells? I think that would be really, really cool to do.” ■



Onkar



LEFT: Peter Salk, a professor of infectious diseases and microbiology, School of Public Health, smiles during the public unveiling of the Jonas Salk Legacy Exhibit in April. He was instrumental in creating the showcase of his father's work in developing the killed-poliovirus vaccine. BELOW: Visitors get a glimpse of equipment, memorabilia and images from before and after Salk's introduction of the vaccine.



CENTRIFUGES

Salk's vaccine studies were funded by grants from the National Foundation for Infantile Paralysis (known today as the March of Dimes).

Test tubes by the thousands rotated in machines called roller drums, the motion bathing the growing cell cultures in nutrient broth. Hundreds of large-volume flasks were seeded with cells growing virus to make vaccine.

These centrifuges were used to separate the tiny virus particles from the cells in which they were grown. Cells and cell fragments would be spun to the bottom of glass tubes in the centrifuges, leaving viruses suspended in the clear fluid above.

The Salk Legacy collection includes hundreds of 70-year-old flasks and bottles that contain some of the original inactivated virus preparations. These are in cold storage and not displayed here.



LASTING IMPRESSIONS

PERSONAL ECHOES AND SCIENTIFIC
FOUNDATIONS AT THE SALK LEGACY EXHIBIT

BY MICHAEL AUBELE

For Katherine Phillips, a visit to the Jonas Salk Legacy Exhibit at the University of Pittsburgh had personal resonance. Phillips contracted polio when she was 2, and three of her siblings had it, too. One of them, a sister, didn't survive. That experience remains profound for Phillips, and touring the exhibit this summer stirred memories of what her family endured.

Located in the School of Public Health building along De Soto Street, the exhibit showcases items donated and shipped from storage in La Jolla, California, by the family of Jonas Salk, the University of Pittsburgh School of Medicine virologist who introduced the killed-poliovirus vaccine to the world about 70 years ago.

The free exhibition, which opened to the public April 28, 2023, offers a glimpse of things large and small from that time in history. Visitors will find an iron lung, the long mechanical breathing apparatus that encapsulated a patient from the neck down, and centrifuges, large metal drums that spun to separate poliovirus particles from the cells in which they were grown. Also on display are awards given to Salk, a vaccination consent form for parents to sign for their children and photos of lab work and the public introduction of the vaccine.

"Seeing those things in real life"—Phillips says of the equipment on display and then pauses. "I wasn't quite prepared for how I felt. Those are things I read about and heard about but had never seen." The iron lung struck her: Though she didn't witness it in action herself, her siblings were treated in iron lungs. The virus had left them unable to breathe on their own.

Phillips, 73, and her three siblings were among tens of thousands of Americans, mostly children of her generation, who had polio. The virus can cause breathing problems and paralysis, among other debilitating conditions, and it can kill. Although the poliovirus hasn't been eradicated globally, vaccines have prevented an untold number of infections. The exhibit commemorates

that as it celebrates those events growing out of the University.

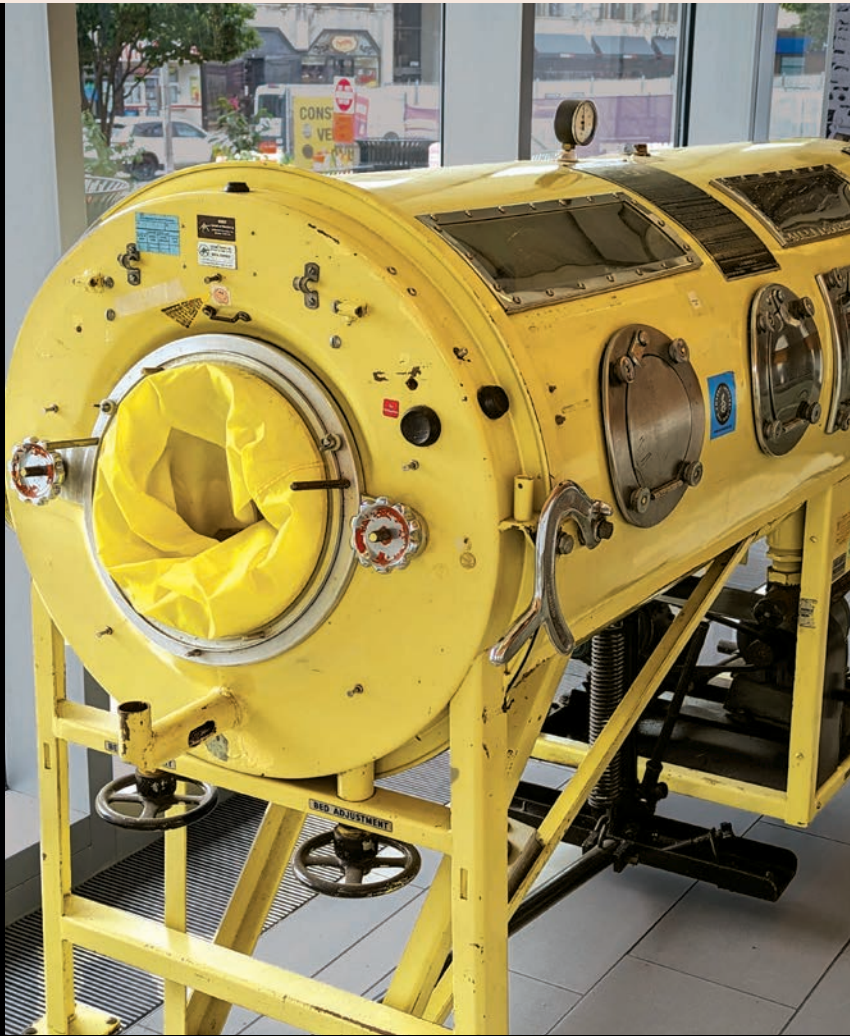
The lasting physical reminder of Phillips' battle with polio is in her vision; she has what's known as convergence insufficiency in her right eye. Her two siblings endured greater physical limitations, and the memory of losing a sister weighed heavily on them through the years.

Phillips, a Pitt-educated nurse (MSN '89) who worked in hematology, marvels at how the displays brought to life the memories of living through a viral outbreak that "hung in the clouds."

"I LOOK UPON OURSELVES AS PARTNERS"

W. Paul Duprex, PhD director of Pitt's Center for Vaccine Research and a professor of microbiology and molecular genetics, suggests that Salk might be uncomfortable with his enduring rockstar status. He references a Salk quote to illustrate his point—one displayed on a wall at the exhibit: "I look upon ourselves as partners in all of this, and that each of us contributes and does what he can do best."

"It's good to be inspired by individuals," says Duprex. "But alongside every single name, there are multiple names. You



can't say Salk without saying [Albert Bruce] Sabin," who developed the oral polio vaccine. "And whenever you say Sabin, you must say [Maurice] Hilleman," who developed many vaccines, including those for measles and hepatitis A and B.

Duprex, who proudly holds the Jonas Salk Chair for Vaccine Research, clarifies that he's not diminishing Salk's contribution to medicine, but contextualizing how scientists build on the body of knowledge their peers and predecessors create.

Pitt's Julius Youngner, a renowned virologist, as well as Byron L. Bennett, L. James Lewis and others on the Salk team were critical to the success of the vaccine—as were the millions who rolled up their sleeves to test the vaccine's effectiveness.

When visiting the exhibit, Duprex found himself most interested in the artifacts on display, like the iron lung. While those technologies seem outdated now, Duprex notes that in 75 years or so, apparatuses used today will seem outdated. "Even though we think we have all these amazing pieces of equipment, they become archaic very quickly," he says. Seeing the historical technologies and approaches in the exhibit, he says, can "help us all appreciate the past but understand where we are in the present." ■

ABOVE: The device that kept polio patients with paralysis in the chest muscles breathing was nicknamed the iron lung. RIGHT: The desk Jonas Salk used during his research at the School of Medicine is a central piece of the exhibit.



Student engineers bring physicians'

IDEAS *to* REALITY

WRITTEN BY KATY RANK LEV • DRAWN BY ATHENA CURRIER



BRANDON BARBER IS THE DESIGN, INNOVATION AND OUTREACH COORDINATOR IN THE SWANSON SCHOOL OF ENGINEERING'S DEPARTMENT OF BIOENGINEERING AND DIRECTOR OF THE IDEA LAB (INNOVATION AND DESIGN ENGINEERING ACCELERATOR). HE'S LONG PARTNERED WITH PHYSICIANS TO GET IDEAS FOR PROJECTS HIS UNDERGRADUATE STUDENTS CAN TAKE ON.

WE WANTED TO BE ABLE TO DO LARGER-SCALE PROJECTS IN PARTNERSHIP WITH FACULTY AND GET THEIR TECHNOLOGY FURTHER ALONG IN THE PROCESS TOWARD COMMERCIALIZATION. WE HIRE OUR BEST STUDENTS TO COMBINE PRODUCT DESIGN, MECHANICAL ENGINEERING, BIOENGINEERING AND CHEMISTRY TO BUILD PROTOTYPES.



Barber does not want students to use the microwave for food; they soften plastic in it for prototypes.

CARL SNYDERMAN, MD PROFESSOR OF OTOLARYNGOLOGY AND NEUROLOGICAL SURGERY AND VICE CHAIR FOR QUALITY AND SAFETY FOR THE DEPARTMENT OF OTOLARYNGOLOGY, HAS LONG BEEN FRUSTRATED BY THE ENDOTRACHEAL TUBES THAT HE AND OTHER PHYSICIANS AROUND THE WORLD MUST USE FOR PATIENTS ON VENTILATORS. TOO OFTEN, THOSE PATIENTS DEVELOP PNEUMONIA.

A commonly used endotracheal tube



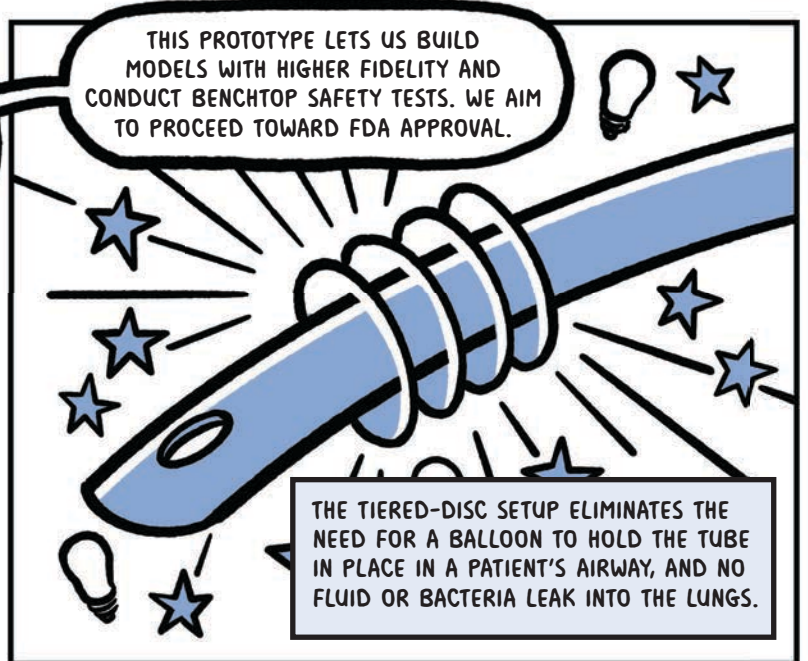
A PATIENT WHO IS INTUBATED MORE THAN 48 HOURS HAS A 1 IN 5 CHANCE OF DEVELOPING PNEUMONIA—AND THEN A 1 IN 3 CHANCE OF DYING FROM THAT INFECTION. THE MEDICAL COMMUNITY HAS JUST TOLERATED THIS PROBLEM. THERE WAS NO ALTERNATIVE.

OUR PRIMARY INTEREST WAS IN IMPROVING THE DESIGN OF ENDOTRACHEAL TUBES TO PREVENT INSTANCES OF VENTILATOR-ASSOCIATED PNEUMONIA.

CURRENTLY, THE TUBES FIT INSIDE A BALLOON-TYPE CUFF THAT INFLATES TO PREVENT AIR ESCAPING THE LUNGS AS THEY ARE VENTILATED. THE CUFFS DON'T PROVIDE A PERFECT SEAL WITHOUT A LOT OF PRESSURE—BUT TOO MUCH CAN DAMAGE THE AIRWAY. SOMETIMES BACTERIA SNEAK AROUND THE CUFF TO CAUSE PNEUMONIA.



To help their ideas become reality, physician inventors like Snyderman often get funding from the Pitt Innovation Challenge or the University's Innovation Institute.



MIHAELA VISOIU, AN MD PROFESSOR OF ANESTHESIOLOGY AND PERIOPERATIVE MEDICINE, NEEDED A TOOL TO TEACH ANESTHESIOLOGY FELLOWS TO DELIVER EPIDURAL ANESTHESIA TO NEWBORNS.

THE BEST WAY TO CONTROL PAIN FOR SURGERY IS A NERVE BLOCK, WHICH MEANS INJECTING NUMBING MEDICATION AROUND THE LUMBAR SPINAL STRUCTURE. NEWBORNS ARE VERY LITTLE—THE SPINAL CORD IS SMALL, THE EPIDURAL SPACE IS SMALL. THE EQUIPMENT IS COMPARATIVELY VERY BIG.

BABIES ARE SENSITIVE TO OPIOID MEDICATIONS AND PLACING AN EPIDURAL IS CRITICAL FOR THEIR PAIN CONTROL. THE PROCEDURE IS EXTREMELY CHALLENGING, AND RARE. EVEN WITH SUPERVISION, THE PROBABILITY OF A FAILED PROCEDURE IS HIGH. I HAD SLIDES AND PHOTOS [TO TRAIN PHYSICIANS]. I REALIZED IT WASN'T ENOUGH.

USUALLY WE GET A PATIENT AND SHOW STUDENTS THE ANATOMY, BUT WE DON'T EXPOSE PEOPLE'S BUTTS TO A CROWD.

Aspiring bioengineers Alyssa Zito (BS Class of '25) and Victoria Turchick (BS '22)

BY THE TIME I DEMONSTRATED THE PROCEDURE TO THE STUDENTS, THE MODEL WAS DESTROYED.

VISOIU BUILT A MODEL OF A BABY BACK, USING CANDLE GEL AND A 3D-PRINTED SPINE. "IMAGINE TRYING TO HANDLE A SPINE IN A JELLO MOLD," SAYS BARBER. "IT JUST FELL APART."

VISOIU FILED AN INVENTION DISCLOSURE TO WORK WITH IDEA LAB TO CONSTRUCT A TOOL TO TEACH ANESTHESIOLOGY FELLOWS TO DELIVER EPIDURAL ANESTHESIA TO NEWBORN BABIES.

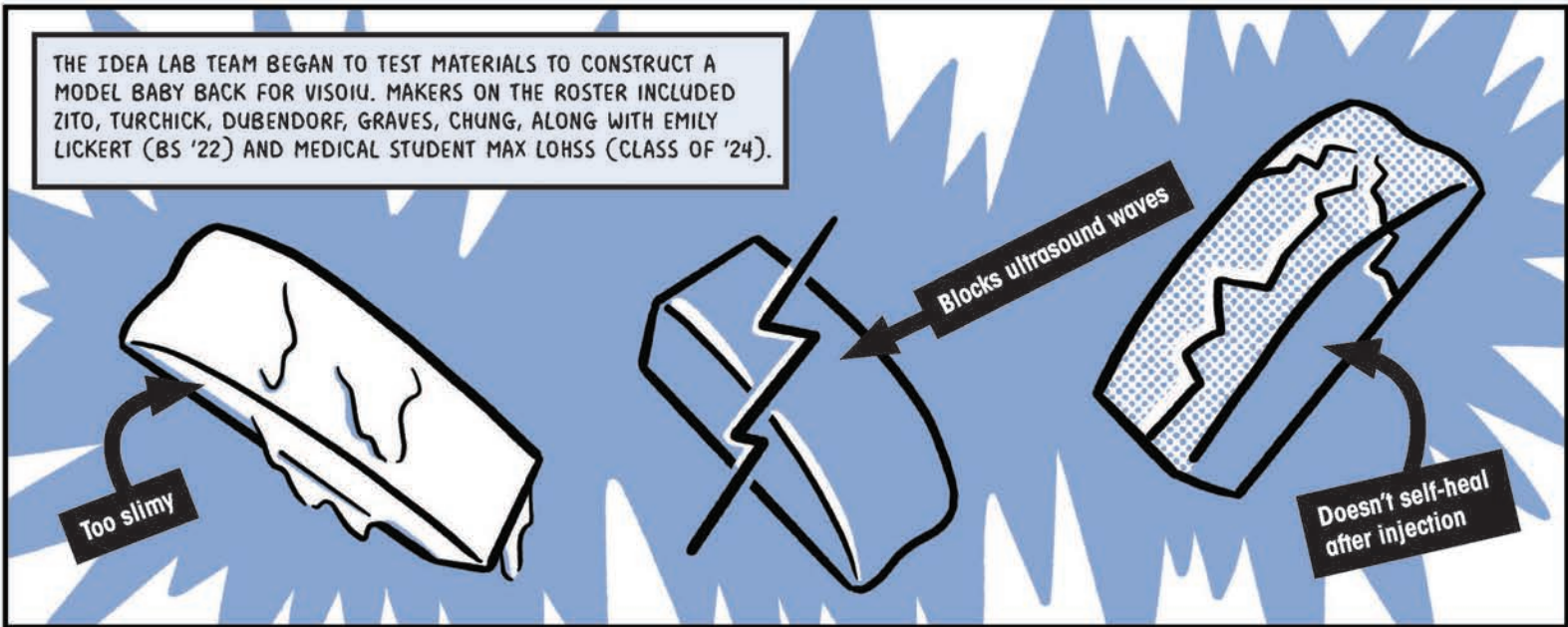


HERE'S WHERE WE KEEP THE BABY BUTTS.

SHE NEEDED IT TO FEEL AND REACT LIKE HUMAN TISSUE, WHILE STILL ALLOWING ULTRASOUND WAVES TO TRAVEL THROUGH THE MATERIAL.



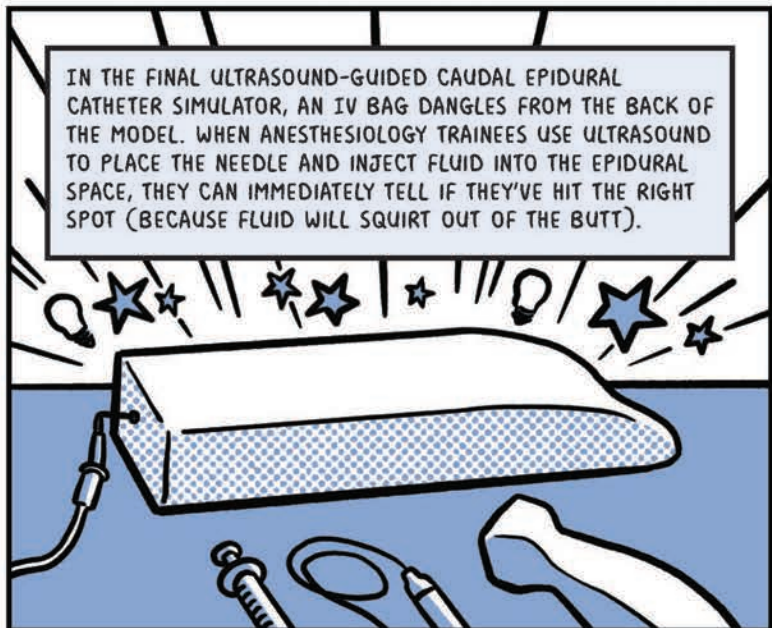
THE IDEA LAB TEAM BEGAN TO TEST MATERIALS TO CONSTRUCT A MODEL BABY BACK FOR VISOIU. MAKERS ON THE ROSTER INCLUDED ZITO, TURCHICK, DUBENDORF, GRAVES, CHUNG, ALONG WITH EMILY LICKERT (BS '22) AND MEDICAL STUDENT MAX LOHSS (CLASS OF '24).



WE WENT THROUGH SO MANY MATERIALS! I WAS PRESSING AND PLACING NEEDLES. IT WAS TRIAL BY ERROR.



IN THE FINAL ULTRASOUND-GUIDED CAUDAL EPIDURAL CATHETER SIMULATOR, AN IV BAG DANGLES FROM THE BACK OF THE MODEL. WHEN ANESTHESIOLOGY TRAINEES USE ULTRASOUND TO PLACE THE NEEDLE AND INJECT FLUID INTO THE EPIDURAL SPACE, THEY CAN IMMEDIATELY TELL IF THEY'VE HIT THE RIGHT SPOT (BECAUSE FLUID WILL SQUIRT OUT OF THE BUTT).





IN 2017, JAMES NEWTON WAS A PITT MED STUDENT WHO'D JUST RETURNED FROM MALAWI, WORKING AT KAMUZU CENTRAL HOSPITAL, A TEACHING HOSPITAL IN LILONGWE. HE NOTICED A HEART-WRENCHING THEME DURING HIS TIME THERE.

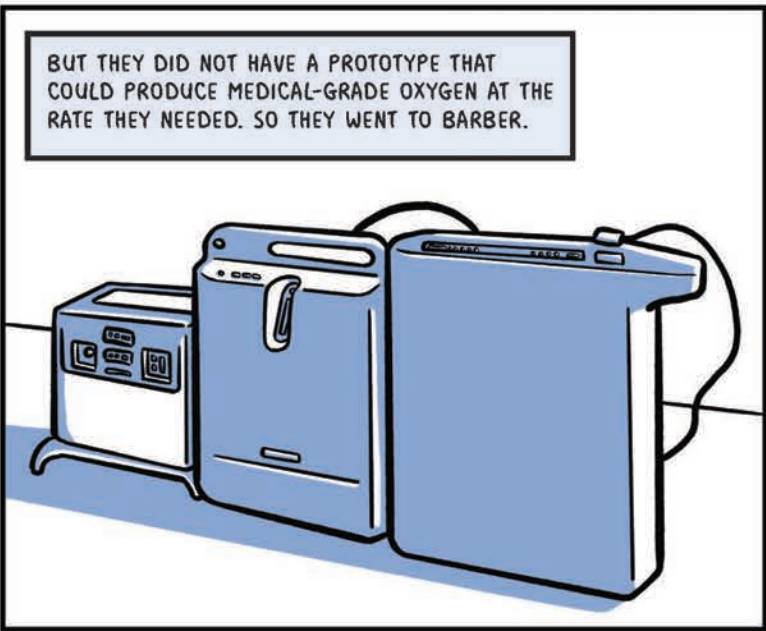
IN MALAWI, PHYSICIANS OFTEN DON'T HAVE ENOUGH OXYGEN TO SAVE ALL THE PATIENTS [IN THE HOSPITAL] AND HAVE TO CHOOSE WHICH WILL LIVE AND WHICH WILL DIE.

WE SHOULD BUILD A PORTABLE OXYGEN SYSTEM THAT CAN BE USED ANYWHERE. LET'S MAKE IT SOLAR POWERED . . .

James Newton
(MD '22, MS '22)

Mark Adkins, Adjunct
Lecturer in Bioengineering

NEWTON AND ADKINS FORMED LEANMED IN 2018 TO PURSUE THEIR PROJECT, WITH ADKINS AS THE CEO. BY 2022, THEY HAD OBTAINED FUNDING TO DEVELOP THEIR PORTABLE OXYGEN SOLUTION. THEY HAD GLOBAL DATA, AND THE WORLD HEALTH ORGANIZATION EVEN RECOGNIZED THEIR O2 CUBE IN THE 2021 COMPENDIUM OF INNOVATIVE HEALTH TECHNOLOGIES FOR LOW-RESOURCE SETTINGS.

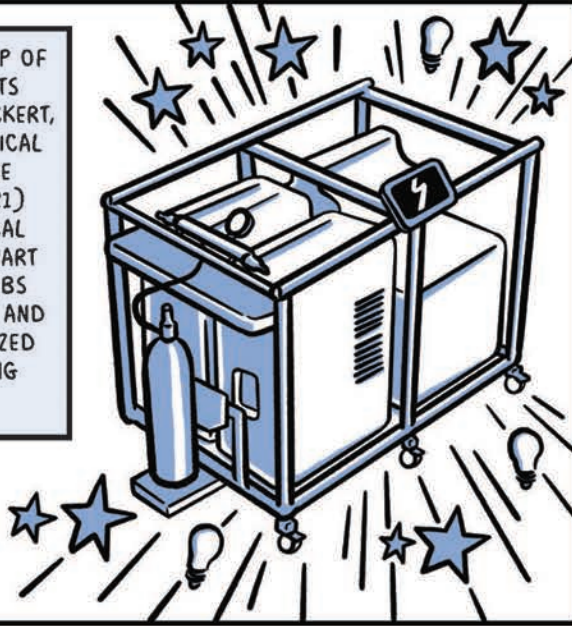


BUT THEY DID NOT HAVE A PROTOTYPE THAT COULD PRODUCE MEDICAL-GRADE OXYGEN AT THE RATE THEY NEEDED. SO THEY WENT TO BARBER.



THEIR PROJECT WAS STUCK IN AN EARLY PROTOTYPE STAGE FOR NEARLY 5 YEARS. THEY HAD PARAMETERS, BUT INVESTIGATORS ARE LIMITED BY THEIR DESIGN PROTOTYPING SKILLS. WE HELP THEM FABRICATE INTEGRATED PROTOTYPES THAT CAN BE TESTED. WE GO A LOT FURTHER, A LOT FASTER.

WITH THE HELP OF IDEA STUDENTS TURCHICK, LICKERT, PLUS MECHANICAL ENGINEER ZEVE COHEN (BS '21) AND ELECTRICAL ENGINEER STUART MCCUTCHEN (BS '22), NEWTON AND ADKINS REALIZED THEIR WORKING PROTOTYPE.



THE MACHINES ALONE COULD NOT MEET THE GOALS OF THE PROJECT. WE CREATED A CUSTOM MECHANICAL CONNECTION BETWEEN THE COMPRESSORS AND A CONNECTOR THAT FITS ON STANDARDIZED OXYGEN BOTTLES. WE HAD TO MAKE SURE EVERYTHING WAS ENGINEERED WELL ENOUGH TO SUSTAIN THE PRESSURE AND THE ENVIRONMENT.



Dan Yates, staff engineer at IDEA Lab

IN JULY 2021, LEANMED ANNOUNCED A GLOBAL LICENSING AGREEMENT WITH PHILIPS TO LEVERAGE THEIR ULTRAFILL OXYGEN FILLING STATION TECHNOLOGY IN ALL O2 CUBES. A COMMERCIAL VERSION IS NOW OPERATIONAL IN NIGERIA; IT CAN PROVIDE ENOUGH OXYGEN FOR ABOUT 3,000 CHILDREN WITH PNEUMONIA A YEAR.



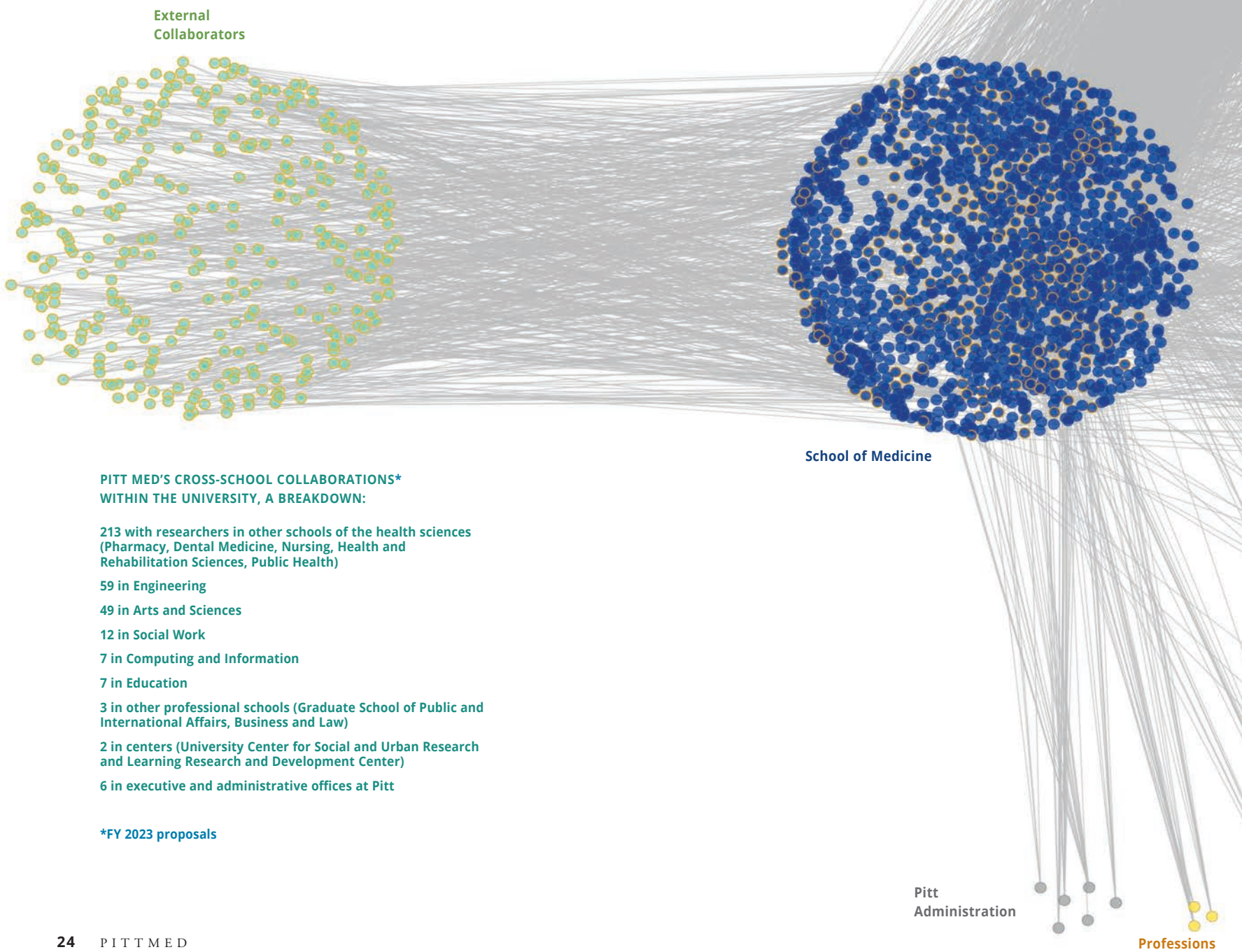
VISOIU AND SNYDERMAN ARE PLEASED TO SEE THEIR INVENTIONS TAKE OFF, AS WELL.

VISOIU NOW CAN TRAVEL WITH THE EPIDURAL SIMULATOR, PRESENTING IN ANESTHESIOLOGY CONFERENCES AROUND THE GLOBE.

THIS MODEL IMPROVED EDUCATION AND TRAINING. WE IMPROVED PAIN CONTROL AND FAMILY SATISFACTION. MY TRAINEES CAN NOW TEACH OTHERS AND BUILD CONFIDENCE. NEXT, I WANT TO BUILD MODELS FOR OTHER TYPES OF ANESTHESIA BLOCKS.



WITH CO-INVESTIGATOR CARDIOTHORACIC SURGEON GARRETT COYAN (RES '22), SNYDERMAN FORMED REPAIR IN 2022 TO FURTHER DEVELOP THEIR ENDOTRACHEAL TUBE. THEY HIRED DUBENDORF UPON HER GRADUATION.



External Collaborators

School of Medicine

Pitt Administration

Professions

**PITT MED'S CROSS-SCHOOL COLLABORATIONS*
WITHIN THE UNIVERSITY, A BREAKDOWN:**

213 with researchers in other schools of the health sciences (Pharmacy, Dental Medicine, Nursing, Health and Rehabilitation Sciences, Public Health)

59 in Engineering

49 in Arts and Sciences

12 in Social Work

7 in Computing and Information

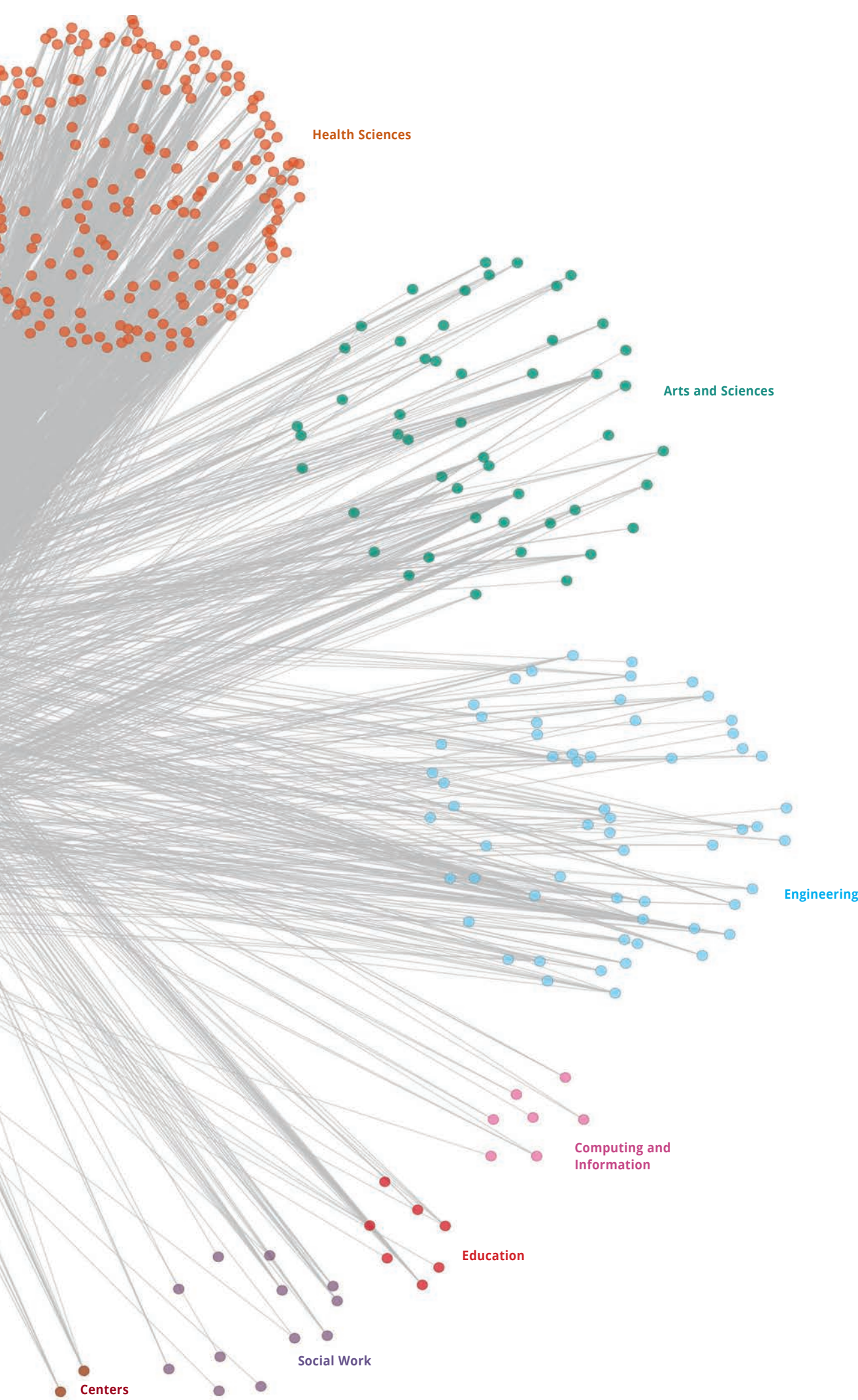
7 in Education

3 in other professional schools (Graduate School of Public and International Affairs, Business and Law)

2 in centers (University Center for Social and Urban Research and Learning Research and Development Center)

6 in executive and administrative offices at Pitt

*FY 2023 proposals



WITHIN OUR ORBIT

The School of Medicine brings people together—and we've got the graph to prove it. See that blue orb? Each dark blue dot within it represents a Pitt Med researcher on a proposal submitted in fiscal year 2023. The gray lines show connections to collaborators both within and outside of Pitt. Of the 1,548 Pitt Med researchers depicted, 1,297 (83.8%) are working as part of a team of principal investigators.

Outside of the health sciences, the most internal collaborations take place with engineers at the Swanson School—see how some of those projects materialize on page 17.

Looking beyond Pitt, 634 sub-awards from Pitt Med went out to 295 external institutions (shown in light green), including universities, hospitals, research centers, foundations and companies. Carnegie Mellon University tops the list of these partners.

Pitt Med's gravitational pull, the data make clear, is drawing a rich solar system of partners.

—Caption by Andrew Doerfler
 —Analysis and visualization by Marcela M. Gomez of Pitt Research
 —Data from PERIS-MyFunding and the Office of Sponsored Programs

By cultivating mindfulness and compassion, health care trainees are better equipped for the stressors of their training. They also make better decisions. Pitt Med is offering its students opportunities to build these capacities.



CULTIVATING EQUANIMITY

MED STUDENTS LEARN TO ATTEND TO THEIR MINDS
SO THAT THEY CAN ATTEND TO PATIENTS

BY ERICA LLOYD

ILLUSTRATIONS BY MICHAEL HIRSHON

Performed at Westminster Abbey. Competed in the Ironman at Kona. Founded a nonprofit. Published research in top biomedical journals. These kinds of résumé highlights are not out of place for an entering student at the University of Pittsburgh School of Medicine.

“When we get here, and you start your first class—and even in orientation—I think everybody kind of looks around and thinks, ‘Wow, these people are so amazing,’” says Juliet Jarrell, a second-year student at Pitt Med.

“And then you start class,” says Jarrell, “and the volume of material is so high. And you’re thinking, ‘Can I do this? Is it a mistake that I’m here?’ There’s this feeling that, ‘I must have just slipped in.’”

“For me and for a lot of my friends, it was, ‘They’re going to find out I’m not supposed to be here’—which is a horrible feeling to have. And obviously not true, because we all deserve to be here. We all went through a rigorous application process to get here.”

The 153 members of Jarrell’s class were chosen from 8,393 applicants. She’s right, there are no slouches in the ranks.

The fear that you don’t measure up, that you don’t have the capability to do what you’ve been tasked with, is called imposter syndrome. It’s not unusual among med students—a population that will soon find themselves entrusted with the lives of others—and it can persist throughout medical training and beyond.

That's why Pitt has brought in Barry Kerzin as an adjunct professor of psychiatry—to work with med students to help them avoid imposter syndrome and other unhealthy mind states. A physician-scientist, Buddhist monk and personal physician to the Dalai Lama, Kerzin cuts a distinctive figure climbing out of an Uber in front of Alan Magee Scaife Hall in his burgundy robes and sneakers.

If students have trouble juggling the demands of medical school, they might assume no one else does. One student notes that it doesn't help if she hears others proclaiming a test was easy—or talking about all the Anki cards they finished the night before. (Anki is a flashcard app.) “One thousand, really?” she says incredulously. “I don't know if people need to voice these things out of their own insecurity, but when you didn't

come in their training and beyond. The stakes are high.

National studies show that med students matriculate with healthier mental states than other recent college graduates who don't pursue medicine; yet by their third year, med students are more prone to depression, burnout and suicidal ideation than are their contemporaries and the general population.

By incorporating secular insights and tools extracted from Buddhist psychology and philosophy—especially a capacity for mindfulness and compassion—into their professional and personal lives, students can ease the strain, says Kerzin. Studies consistently show that meditation and mindfulness approaches, including apps, significantly reduce stress and improve cognitive performance among nurses and other care providers and trainees.

Kerzin's work here complements a number of initiatives the school has put into place over the years to look out for its students, so that they in turn can look out for themselves and their future patients. Those efforts take the form of smaller communities of learners (matriculating students are put in “houses” with advisory deans); mental health resources that include psychiatrists, therapists and student advocates; and a host of wellness activities (from therapy dogs to family-style dinners). Even the newly launched curriculum incorporates six flex weeks and more small group sessions, which will reduce isolation as it promotes active learning. “We wanted a schedule that gave students time for self-care and exploration,” says Jason Rosenstock, an MD professor of psychiatry and associate dean for medical education.

Pitt's Suzanne Templer, a DO associate professor of medicine and assistant dean for undergraduate medical student affairs, is the faculty lead for the student-run well-being committee. She introduces incoming students to mindfulness and meditation practices at orientation, during their very first days on campus.

Templer discovered the benefits of these practices after she suffered complications from herniated disc surgery. That operation was Election Day, Nov. 8, 2016.

“I was basically bedbound, staring at the ceiling. And it would come to a point around 4:30 in the afternoon that I had been up all day with my thoughts. I realized that being with your

find the test easy, you don't want to hear it.”

Just as advertisers employ subtle messages that bypass our conscious mind, “we have subliminal messages we flash to ourselves to put down others and ourselves,” Kerzin says.

“This is something we usually don't even notice,” he adds.

Kerzin teaches people to notice what their minds are up to. He's based in India, but he's spending time here in Pittsburgh teaching med students how to become attuned to their inner lives—to cultivate, among other things, what he calls “healthy self-confidence,” so they will become able to turn insecurity into confidence, and arrogance into humility. (On page 31, he offers guidance on how to achieve this.)

The thought is that this level of awareness, of emotional intelligence, will enable med students to build the foundation for skillfully managing the stressors of their studies—and what's to

thoughts isn't always a positive.

“That's how I picked up this idea of slowing down and taking care of yourself before you can take care of others.”

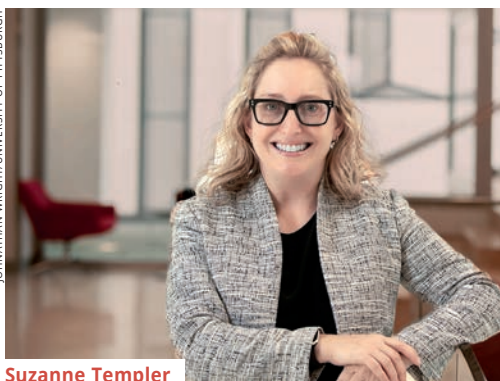
As she explored the practice of mindfulness, she found it centering.

“I think [mindfulness] really helped me get through COVID,” says Templer, who is an infectious disease specialist. “[Without it], I would have felt lost. I was living and breathing anything COVID—webinars, articles, websites, listservs. There was no escaping it.”

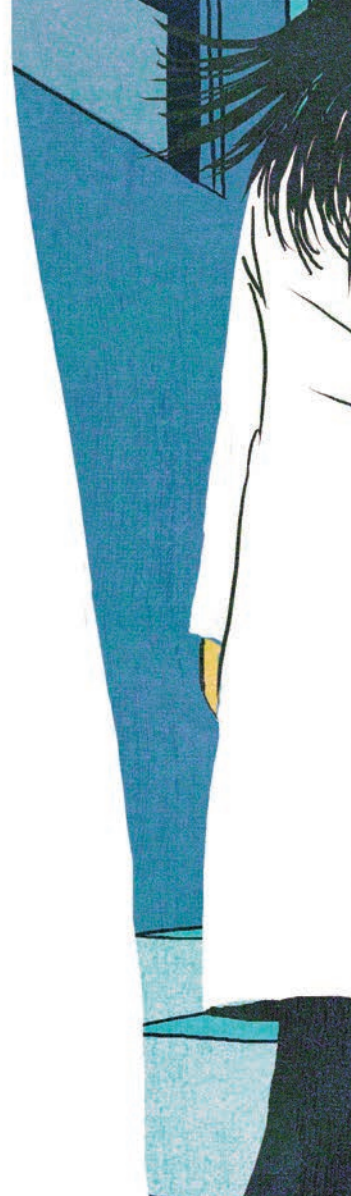
She added a five-minute meditation each morning to her routine (which by then already included an evening meditation). “It was really helpful in keeping me level.”

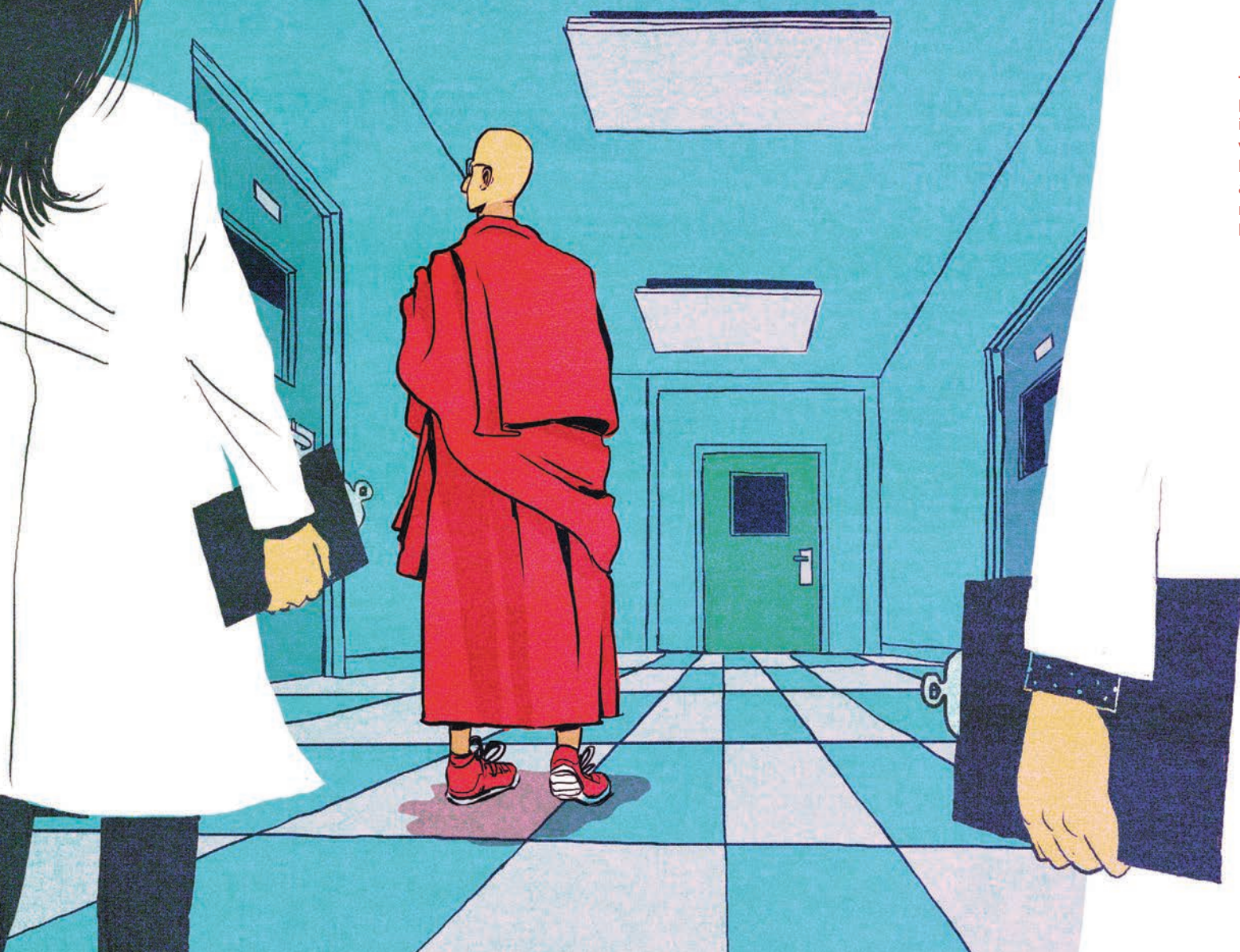
Discovering the benefits of mindfulness “changed my trajectory,” says Templer. She was at Lehigh Valley Health Network at the time, where she became chief wellness officer.

“There were tools I could have probably been taught during medical school, or at some point in my training, that just were never taught.”



Suzanne Templer





The Dalai Lama's personal physician is staging an intervention: He's giving health care providers and trainees tools to rejuvenate and avoid burnout.

Personal difficulties led Kerzin to championing mindfulness in medicine, as well. His route, though, was more roundabout than Templer's, taking him through the foothills of the Himalayas.

When he was 10 and growing up in Southern California, he often played outside with the other kids during long summer evenings. One of those nights, Kerzin developed a severe headache. The cause was a brain abscess that led to a coma and almost killed him. The subdural abscess rotted the left upper frontal area of his skull, requiring removal of that bone. He wore a helmet for the next couple of years until his neurosurgeon put in a plastic plate.

The 13-year-old Kerzin had a new hero: Maxwell Andler, the neurosurgeon who saved his life. "There were no doctors in my family, but I wanted to be like him. That was in my heart."

Years later, after attending University of California, Berkeley, and Lund University, in Sweden, to study philosophy, Kerzin chose to go into medicine instead. "My heart won out," he says.

Five days before starting medical school at the University of Southern California in Los Angeles,

his heart directed him again, and he married Judy, a UC Berkeley law student. After med school, he completed a family medicine residency and then established a small private practice in Ojai, California.

Just months after the practice opened, the Kerzins received devastating news. Judy, by then a lawyer, had ovarian cancer. She died three and a half years later. The other most important woman in Kerzin's life, his mother, had died a few years before.

Kerzin took some time away from medicine, backpacking in India, Nepal and Sri Lanka for about six months to clear his head. "I was trying to figure out this grieving stuff, which was pretty heavy and intense."

He eventually returned to the United States and to practicing medicine—first in California, and then in Seattle, where he accepted an assistant professor position at the University of Washington. One day he got a call from B. Alan Wallace, a friend and scholar of Buddhism:

"Would you travel to Dharamshala, India?" Wallace asked. "The Dalai Lama wants a

Western-trained physician to interdigitate different medical systems, so that if one fails, the patient can avail another."

Kerzin secured a six-month visa that he ended up extending, again and again, over the next 34 years. Throughout that time, he's provided free medical care to Tibetan refugees, poor Indian families and to the Dalai Lama. He was fully ordained by the Dalai Lama as a monk in January 2003.

In 2005, the Dalai Lama asked Kerzin to teach. He happily complied, setting up the Human Values Institute in Tokyo, and more recently, the Altruism in Medicine Institute (AIMI) in Pittsburgh. Kerzin is particularly interested in helping health care practitioners. He's been working with thousands of UPMC nurses since 2018, as well as other U.S. providers. He also teaches as an adjunct professor at the University of Hong Kong, as an honorary professor at the Mongolian National University of Medical Sciences, and in Russia, Ukraine, the U.K. and elsewhere.

He has codeveloped an app for health care

providers, called AIMicare, to help them rejuvenate and to cultivate mindfulness and compassion wherever they are.

In the United States, says Kerzin, “Upwards of 60% of third-year medical students, and in some studies, 75% of residents and doctors in practice are burned out. So, the majority of medical practitioners, including nurses, suffer from emotional exhaustion, loss of purpose and meaning in their work. This has been exacerbated by the COVID pandemic, but it existed before.

“We’re supposed to be back to normal. There’s no normal now. We haven’t healed from all of the trauma that we accumulated during the pandemic.” Providers are leaving the profession “in droves,” says Kerzin.

The World Health Organization has established a diagnostic code for workplace burnout, which is characterized as experiencing emotional exhaustion, a loss of meaning and a loss of a sense of purpose. In the clinic, burnout can lead to depression and “lateral violence”—i.e., aggressive behavior like backstabbing and bullying—as well as lower quality of care.

Templer notes that some of the risk factors for burnout are practical requirements for going into a caring profession—like making personal sacrifices (“What students don’t put patients’ needs before theirs?” she asks), being a perfectionist (in the hospital, accuracy can mean life or death) and lack of control (sickness and aging are part of life, after all).

That’s why, in addition to changing its learning environment and structure in the many ways mentioned earlier, Pitt Med is helping students develop tools to draw on.

Templer also tries to prepare them for a journey: “As they go through these different transitions, like switching to clinical rotations, or moving on to residency, this is when burnout can happen. They might experience a sense of loss of control. They may have felt that they had a good understanding of the expectations, and now they’re thrown into a completely different environment. They

don’t know where to start again, and how to get their feet back on the ground.”

Templer finds it can be centering for students to devote a little time to think about why they’re in medical school. “A lot of times burnout happens because people forget the why.”

Emily Levin, a second-year med student and Zen practitioner, understands that students may not have the bandwidth to add one more thing to their schedules, even something as beneficial as meditation.

“I’ve wrestled with the question of injecting well-being into a system that’s burnt out. Sometimes you can’t add more to a system that’s already full.”

She shares the parable of a Zen master who is pouring tea for a student, but the student’s cup is full—still the teacher keeps pouring, and the tea just floods over and over:

“You need to empty the cup. You need to empty your mind to let in the new information.” She encourages her peers to take a few hours for themselves. And for those who are interested, she and some friends will be hosting a brief weekly meditation sitting in Alan Magee Scaife Hall—a chance to clear the mind a bit.

Tea will be served. (Third-year students who ran a group called Art of Living are passing along a teapot they used during sessions that they hosted before their clinical rotations started.)

“It’s low stakes for students to try,” says Levin, “and it’s something I want to do anyway.

“It’s my way of emptying my cup.” ■



PHOTO COURTESY KERZIN. PHOTO EDITING: BRANDON COPP-MILLWARD

Barry Kerzin

NO JUDGMENT

When she was 15, Emily Levin began meditating with her mom. That was around the time they learned that her mother had colon cancer. She died when Levin was 16. “After my mom passed away, I held onto [my meditation practice],” Levin says.

She went on to graduate from Boston University and lived at the Cambridge Zen Center (of the Kwan Um School of Zen) for two years before getting a PhD in cognitive neuroscience from Brown University. She’s now a second-year med student at Pitt.

“My Zen practice really helps me feel grounded—more than grounded, present. That’s helped so much in medical school. Often, we have an idea in our minds, and we just hold onto that idea, that opinion, and we’re not really listening to the patient or other person in front of us.”

Levin volunteers for the Guerrilla Eye Service (GES), a nonprofit that provides free eye care to people who are underserved and underinsured. One day at the clinic, through a translator, she learned that a patient she was seeing, a young woman with diabetes, hadn’t checked her blood sugar. Levin, who herself has type 1 diabetes, wondered: Why would the woman, who was suffering vision loss related to her diabetes, not take care of herself? Had Levin not had her Zen practice, and had this woman not been diagnosed recently, Levin might have rushed to judge her.

Yet, Levin says, “I was able to focus on my role, which was to do the exam and history with a clear mind, before seeing the next patient.”

Although Levin and her colleagues had a number of appointments to get through, she eventually went back to the patient to ask her why she hadn’t been testing her blood sugar. That’s when Levin learned that the woman did not have a glucometer or testing strips, nor did she know how to use them. “My God,” Levin thought to herself. “Let’s get her some help.”

Levin has since worked with GES partner clinic directors to assess how widespread the problem might be, as well as with kit manufacturers to get glucometers and testing strips to GES patients in need. And soon, GES clinic volunteers will offer diabetes maintenance and care tutorials to those who can benefit. “After the patient’s [eyes have] been dilated, we can sit with them and show them how to do the test.”

—EL



CURES FOR PUT-DOWNS

Barry Kerzin offered this lesson for developing what he calls healthy self-confidence:

There's a kind of mindfulness we teach that's dropping into the present moment at will. I call it mindfulness with a capital M. There's a lot of healing and a lot of joy in that; and a lot of love and compassion and wisdom that happens in the present moment.

When you notice you're in a put-down mood—either putting yourself down or putting someone else down, then you say, "Okay, I need to be practicing healthy self-confidence. So how do I get there?"

One tool we teach, for imposter syndrome, is letting people know: You don't own that feeling. When you were a kid, most likely, it was imposed upon you somehow. And you heard it a number of times—for instance: "You're a girl, you can't do that." Or, "You're not very smart,

very handsome or pretty." "You're not very agile." And you heard this again and again, and you started to adopt it as your own attitude toward yourself. So we tell people, "You have every right to get rid of that feeling, as it was imposed on you."

So you allow these thoughts or feelings to come up—maybe, thinking you're not good enough. And you train yourself not to react. You just observe it. And by just observing it, you don't give it the spotlight. And that feeling of not being good enough is kind of narcissistic. It needs a lot of attention. If you don't give it, over time, the feeling will weaken and eventually go away.

That won't happen in one day, of course. It's ingrained. But if you're persistent, and you don't give it the spotlight, it'll become less and less of an influence and powerful.

Or maybe you notice that you're arrogant. You're feeling better than others, you're feeling you know everything. There are pitfalls with that, such as you lose all your genuine friends, because no one likes to be put down.

You're also feeling that you know everything—so you don't read, you don't grow. When you're in a conversation with someone, you're not listening. You're actually forming your next words that you're going to speak, because you think you know best.

It's like being shackled, like being in solitary confinement.

So you remember the pitfalls of arrogance, and that will help you become more humble.

And in terms of putting yourself down, you move toward healthy self-confidence. In terms of putting others down, you move toward humility.

Emily Levin shared this technique for gaining clarity and staying in the present moment:

The mystery of her Guerilla Eye Service patient was easy to solve, Levin points out. But sometimes there aren't straightforward answers to the questions that nag us. She refers to the teaching of Zen Master Seung Sahn, who encouraged people to adopt what's called "don't know mind." Levin finds it helpful for the big questions in her life like, why did her mom die when she was 16? And, why does she have diabetes? "Or, 'Who am I really?'" says Levin. "And the only answer to that is, 'Don't know.' It's a mantra you can use—asking yourself, for instance, 'Who am I?' on the inhale. And then answering 'Don't know,' on the exhale. It allows you to really see what's in front of you. And then to help with that first."

“THERE’S NO SUCH THING AS COMPASSION FATIGUE.”

“I hear prominent people talking about ‘compassion fatigue.’ It’s a misnomer,” says Barry Kerzin, MD adjunct professor of psychiatry who is a Buddhist monk.

“There’s no such thing as compassion fatigue, just empathy fatigue,” he says.

“If we are healing professionals,” Kerzin posted in a Human Values Institute blog, “and we are around people who are sick, and often, angry and depressed, we’re going to take that on. And then it’s much easier to burn out.”

The key is to make a shift, to cultivate compassion rather than empathy, he explained during a visit to Pitt in the spring. He defines empathy as “standing in the other person’s shoes. We are so close emotionally that, inadvertently, we take on the others’ suffering. And if we do that many times in a day—day in, day out—that’s an avenue, I sometimes call it a boulevard, to burnout.

“A way to protect ourselves, to have less burnout, is to move beyond empathy to compassion.”

Compassion is the wish to relieve suffering—rather than the adoption of another’s suffering, he explains.

“When you’re empathetic, you’re enmeshed. So we train people to take a half-step back emotionally. If you’re not so quite on top of the other person, so close, the heart is still open, but you have other cognitive faculties that are available . . . to more clearly see how to reduce the suffering of the other person.”

“But how?” a third-year student asked Kerzin after a recent talk.

“There are no tricks here,” Kerzin said. “There’s no magic, just knowing that you want to be a little less close, to create a little bit of distance emotionally. Just knowing that will help you get there when you find yourself being empathetic.”

The student shook his head and said, “I will try.”

“It’s not as hard as you think,” said Kerzin. “Knowing that is at least half the battle.” —EL

Learn more about cultivating compassion and healthy self-confidence with Kerzin’s AIMIcare app, free from Apple and Google Play stores.

“DOCTORS SHOULD THINK OF THEIR WORK AS SOMETHING ALMOST SACRED”

Even before medical students spend much time in the clinic, they can be maxed out, says Juliet Jarrell. She’s a SHARP (Student Health Advocacy Resource Program) representative—a mental health advocate for her second-year classmates. In that role, she meets with many of her peers who are looking for support or referrals for professional resources. Jarrell often hears them say that with the pressure of their studies, they find themselves becoming increasingly impatient, so much so that they have trouble paying attention to the concerns of friends and family.

And that sets the stage for trouble during their future practice, Jarrell says.

Health care trainees cannot afford to

Compassion is the wish to relieve suffering—rather than the adoption of another’s suffering.

abandon compassion, says Kerzin. One of his priorities as a teacher is to help them cultivate it.

“There is a common perception that compassion is, if not actually an impediment, at least irrelevant to professional life,” he says. “But not only is it relevant, when compassion is lacking, our activities are in danger of becoming destructive. This is because when we ignore the question of the impact our actions have on the well-being of others, inevitably we end up hurting them.”

He shares this message from his patient the 14th Dalai Lama:

“Even under pressure of time, doctors should think of their work as something almost sacred, as akin to spiritual service. In my own experience, a smiling doctor puts us at ease, whereas a stern-faced physician is a source of anxiety. Even when doctors and nurses know the patient in their care

Kerzin, a Pitt adjunct professor, was ordained as a monk by his patient the 14th Dalai Lama.



is unlikely to survive, it's important to be kind and compassionate toward them. At the time of death, it's crucial to be at peace, not angry or fearful. At the start of our lives, we encounter compassion in our mother's affection, and as our lives come to an end, we need compassion again." —EL



CLASS NOTES

'60s

Among the interactions he had with Jack Myers, chair of medicine from 1950-1970, a few stand out for **Steven Roth** (MD '67, Internal Medicine Resident '71) that were cringeworthy at the time but now make him laugh. Roth says Myers was known to be all-business and could be gruff. He remembers Myers once asking him to quiet a conversation in the hospital hallway at Presbyterian



Roth

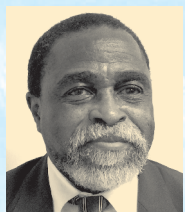
Hospital (now UPMC Presbyterian) during morning rounds. Myers wanted the exam room door open to help with ventilation. After Roth made sure all was quiet and walked back into the room, another resident walked in and closed the door, not knowing about Myers' request. Roth says of that event, "Myers assumed that I had closed the door to keep things quiet. His face reddened, and he pointed at me directly and

said (and this is not a direct quote), 'When you can keep this floor quiet and orderly, I will conduct teaching rounds again.' Then he stormed off the floor.

"Dr. Myers was a fantastic clinician and a very good educator and teacher, and I had a very good relationship with him despite a few episodes," says Roth, who later became chief resident. Now a retired cardiologist, Roth, 81, plays tennis three days a week near his home in Pasadena, California.

'70s

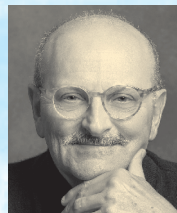
For decades, retired urologist **Ray Brodie** (MD '77) has had an outsized presence in the Maryland medical community. In addition to his private practice and work as an attending



Brodie

at a number of hospitals, he was a clinical instructor at the University of Maryland, regional medical director for Prison Health Services, policy specialist for the Maryland Department of Mental Health and Hygiene, quality assurance director for Alternative Homecare, chair of the board of directors for Total Healthcare (a 40,000-member Medicaid HMO) and president of the board for Constant Care Community Health. He was also a physician advisor for the American Cancer Society. Recently, Brodie was honored by the Baltimore Alumni Chapter of Kappa Alpha Psi Fraternity as one of its Centennial Achievers.

About a decade ago, **Joseph Purpura** (MD '76) started jotting down ideas on a legal pad and kept fleshing them out until he felt he had enough to create a novel. It took about a year for him to convert those notes into "Code Crisis," which features a gynecologist who becomes entangled with a CIA officer. The novel, his first, became an Amazon top-seller in the medical thriller and medical romance genres. Purpura, himself an ob/gyn who practiced in Chicago before moving to Montecito, California, where he's an associate vice president and head of medical device safety at Abbvie, says the book isn't autobiographical. "I love reading spy novels and love doing research," he says. "So, I needed a female protagonist, and I drew from this idea. . . . I had a few patients in my gynecology practice that I never got straight answers from. They traveled a lot, and I got the feeling they just couldn't say anything about it. And that's the beauty of fiction. You can add a disclaimer but still write something that can be believable."



Purpura

'00s Michelle Thompson

(Family Medicine Resident '06) is not only board-certified in family medicine, lifestyle medicine, mind-body medicine and integrative medicine, but she also trained as a massage and neuromuscular therapist. She runs trauma-informed mind-body skills groups for health professionals and patients and is considered a de-prescribing specialist for patients with polypharmacy. She cites her grandfather having died at 36 from diabetes as informing her desire to understand and practice lifestyle medicine. As medical director of the UPMC

Lifestyle Medicine Program, she is especially excited for the new generation of physicians to recognize that "if we care for ourselves, we will take better care of our patients."

While 5% of surgeons in the United States are Hispanic or Latino, estimates are that women make up only 1% of that group, and **Paula Ferrada** (Critical Care Fellow '09) wants to help change that. Efforts to promote equity, diversity and inclusion are part of the legacy she's creating for herself, as are her contributions to trauma resuscitation and ultrasound. Ferrada, the division and system chief for acute care surgery and trauma for Inova Health System and a professor of medical education at the University of Virginia, took an active role in the #LookLikeASurgeon social media campaign about eight years ago; she says the message that surgeons can look like her and share a similar background continues to be important. "When under-represented minorities see that one of us is able and capable, and that there are opportunities to grow academically, they see that there's hope, that there's light at the end of the tunnel."



Ferrada

The Tennessee Department of Health recently appointed **Tobi Adeyeye Amosun** (MD '04, Pediatric Resident '07) as its deputy commissioner for population health. Amosun previously served as assistant commissioner for Tennessee's Division of Family Health and Wellness, where she focused on improving maternal and child health and reducing injuries and chronic diseases. She oversees a \$1.5 billion departmental budget and is invested in creating a collaborative workforce culture for more than 2,900 employees and implementing state health policy to protect, promote and improve the health of Tennessee residents.

'10s

After **Dana Previte** (PhD '17) finished as a postdoctoral associate at the Eye and Ear Institute in 2021, she joined Krystal Biotech as a scientist in product development. The Pittsburgh-based company focuses on gene therapy for rare skin diseases and other indications and tissue areas. Krystal has developed the first redosable gene therapy and only FDA-approved medicine for dystrophic epidermolysis bullosa, which causes skin to become fragile, blister and tear with minor friction or trauma.



Previte

MAA SAYS



JOE APPEL PHOTOGRAPHY



Yecies

Many of the patients that **Emmanuelle Yecies** (MD '14, Internal Medicine Resident '17, MS '19, Women's Health and General Internal Medicine Fellow '20) treats at the VA Palo Alto Healthcare System approach medical care with some distrust. "A lot of them have had negative experiences and have not felt respected," she says of the female veterans in her care. Yecies, a staff physician at the VA and a clinical assistant professor of primary care and population health at Stanford University (affiliated), says her passion is making sure her patients not only get the best treatment but get compassion, as well. The veterans she sees often endured trauma before and during their time in the military, and her mission "is to be a positive force for them and get them the care" they deserve but have been hesitant to seek out.

—Michael Aubele and Vivian Wang



Roughly 150 started their journeys as med students at the Class of 2027 White Coat Ceremony. The event featured remarks from Dean Shekhar and other leaders in medicine and included performances from groups such as the Pittsburgh Ballet Theatre. The ceremony is made possible with support from (the late) Freddie Fu, Hilda Pang Fu, the Medical Alumni Association and other generous souls.



SPOTLIGHT

**BACK TO BASICS
SCIENCE-FREE SYMPOSIUM
ADDRESSES LIFE CONCERNS**

So many questions. Whether they are trainees, or it's early in their faculty careers, or they're transitioning from academia to industry or they want to take on leadership roles, Richard Steinman has seen physician-scientists face decisions they don't feel fully prepared to make.

Having witnessed plenty of his mentees and colleagues grappling with questions about their careers, Steinman (Res '90, Fel '92), an MD, PhD associate dean and director of the Medical Scientist Training Program and an associate professor of medicine, of pharmacology and chemical biology, thought he'd help. And he thought he'd do that by generating answers in a format his audience would appreciate—a symposium.

"Most symposiums are highly scientific," Steinman says. The Physician Scientist Symposium he and his steering committee created was not.

The inaugural event in June at the Heinz History Center brought together trainees, faculty, alumni and career experts to talk about issues that ranged from work-life balance to entrepreneurial skills to finding support in preparing grant proposals. About 300 people attended.

"The goal of the symposium was to allow for same-career-level and across-level dialogue about the strategies needed to persist and thrive as physician-scientists," Steinman says. "There's evidence that ongoing communication and networking will continue beyond the symposium day."

Anonymous feedback has been overwhelmingly positive. Wrote one attendee: "The discussions I had over the weekend not only showed me that my concerns regarding life priorities are common, but that I will be able to structure a life/career that fosters personal and professional happiness. I learned several new tools to cope with feelings of burnout, and I am already feeling so much more optimistic about the path ahead!" —*Michael Aubele*



At the symposium, the top questions were less "Why won't this experiment work?" and more "Who can help me get funding for this research?"



JOE APPEL PHOTOGRAPHY

FROM THE BARD

For 11 years, Richard Steinman, an MD, PhD, has been penning sonnets in honor of newly minted grads of the Medical Scientist Training Program. Here's a taste, in the form of his second stanza recognizing Class of 2023 MD, PhD graduates Oyin Dosunmu-Ogunbi and Joshua Tashman.

The sick in sickle cell awaits a cure.
The villain—superoxide—will concede
to SOD2 (“hero”) to ensure
that mitos work and sickle sick recedes
In nearly half, of African descent,
a SOD2 SNP is kryptonite--
that's Oyin's skillful find. Next, she'll augment
the team at Boston Peds with her insights

Josh Tashman—what a set of FRESH insights
he brought to transform how organs can grow.
He'll spray a heart or kidney parts in bytes,
in 3D molds like loaves from tissue dough.
With Josh in Path at Brigham, this dynam-
ic duo bats a Fenway Park grand slam.

Attention class!

If you have news about an exciting career advancement, honor, publication or gratifying volunteer work, let us know. And we love to hear your Pitt memories. Share updates with our Alumni News editor, Michael Aubele, at mia97@pitt.edu.

PITT MED TRIVIA

Can you answer these without going online?

(We encourage you to call doctors-in-the-know for consults.)



GETTY IMAGES/CAMPILLOWLAKE

1. Henry “Doc” Carlson spent 1922-53 as a head coach in Pitt athletics, winning two national titles and fielding a starting lineup one year that featured five medical students. He was also director of student health services. What team did Carlson coach? Hint, he was famous for his “figure eight” offense.
2. Pitt students can now sit and study at the desk of what giant in medicine? (How carefully did you read this issue?)
 - A. Anthony Fauci
 - B. Thomas E. Starzl
 - C. Jonas Salk
3. The University of Pittsburgh School of Medicine, formerly the Western University of Pennsylvania Department of Medicine, came about through a merger with the Western Pennsylvania Medical College. What year did that happen?
4. The Allegheny and Monongahela rivers form the Ohio River not far from Oakland. Which of the three runs north from end to end?
5. In the mid-1950s and 60s, many Pitt Med students listened to KDKA radio personality Regis Cordic. What beer did he promote as the “pale stale ale with the foam at the bottom”?

Done? Now, check our inside back cover to find out if you aced this one. And if you have an idea for a Pitt Med-related trivia question, send it our way; we're all ears: medmag@pitt.edu.

FROM OPPRESSION TO PROMINENCE DOCTORS AT AN UNLIKELY TIME

In the late 1800s, Charles C. and Maria Fairfax Brown, who are believed to have been formerly enslaved, parented eight children in Winchester, Virginia, while they pursued various business interests. Two of the children, James and Harrison Brown, graduated in 1904 from the University of Pittsburgh School of Medicine, then known as the Western University of Pennsylvania Department of Medicine.

(James and Harrison could be considered Pitt Med's first African American graduates, depending on where you draw the line on what was Pitt. In 1888, John Paul Golden became the first African American to earn an MD from an earlier Pitt Med forerunner, the Western Pennsylvania Medical College.)

Two of the Brown children died young. All the others—James and Harrison, as well as Sara, John, Edward and Nancy Brown—went on to achieve prominence in careers as physicians and pharmacists.

Judy Humbert, a local historian in Winchester, says a lesson she heard during

high school about the Browns and their success against very long odds sparked a lifelong interest for her in the family and its connection to Pittsburgh; James and Harrison's two brothers also settled in the city.

Humbert and her friend Sharon Dixon, both involved with the Black History Task Force in Winchester, started to dig deep several years ago into the family's history—long after Humbert graduated from the Douglas School, an all-Black school that operated in Winchester from 1927-1966 during racial segregation, where she first heard about the Browns.

Humbert and Dixon sought records from Pitt, Howard University, Williams College, Cornell University and the University of Pennsylvania, among other sources, through email and online searches. "We kept digging and digging," Dixon says.

Using the information they collected, they created the theater reading, "The Science of Our Success: The Brown Family Story." Humbert

and Dixon held one of the readings in Frederick County, Virginia, at the one-time residence of 1904 Howard University medical school graduate Sara Brown.

"It was just amazing to be there at the homeplace of one of these doctors," Dixon says.

Dixon discovered that Sara Brown was the first African American graduate of Cornell, which Sara attended before going to Howard. Among other notable successes, Sara Brown was a founding member of what now is the National Association of University Women, and in 1924 became the first alumna elected to the Howard University Board of Trustees.

James, Harrison and their brothers migrated to Pittsburgh, where they opened medical and pharmacy practices in Brushton and the Hill District. John Brown, the oldest of the brothers and a physician who graduated in 1896 from Medico-



UNIVERSITY OF PITTSBURGH

Chirurgical College in Philadelphia before it merged with the University of Pennsylvania in 1916, bought property along Wylie Avenue in the Hill District. His brothers James Brown, a fellow physician, and Edward Brown, a pharmacist, lived with him at least for part of their time in Pittsburgh, Dixon says.

Edward Brown and college friend Isaac Jennings established a pharmacy in the Hill District that is believed to be the first pharmacy in Pittsburgh owned and operated by African Americans.

James Brown became a urologist with a prac-

ABOVE: A tear runs across Harrison Brown's face in this turn-of-the-century Pitt Med class photo, taken in 1899. Harrison and his brother James (shown left of Harrison) graduated from Pitt Med in 1904. LEFT: Pitt Med's Class of 1904.



STEWART SELL

JAN. 20, 1935 – JUNE 16, 2023



Sell

tice in Brushton and an estate near Schenley Park. Humbert says that, like his brothers and sisters, he was known for his generosity. “James would treat you even if you didn’t have the money,” she says. “That’s the kind of person he was.”

James Brown earned a pharmacy degree from Pitt after obtaining his MD and joined Pitt faculty as a demonstrator in urology before being promoted to instructor and then instructor emeritus during the 1953-54 school year. University Library System archivist Zach Brodt says James was among the first Black faculty at Pitt, if not the first.

Harrison Brown, who was older than James, became an internist, and according to historical information, was called “Dr. Harry” to avoid being confused with James. Williams College honored Harrison Brown as its first Black alumnus to earn an MD by creating the Harrison Morgan Brown Premedical Society for premed Black students.

Dixon doesn’t know why the Brown men settled in Pittsburgh, though it’s known they enjoyed close relationships here. In the meantime, Sara Brown and her sister Nancy Brown, a pharmacist, settled in the Washington, D.C., area after earning their degrees. Only Edward married.

Humbert says the Brown men planting themselves in the same city and the women in another “speaks to how close-knit the family was.” —MA

Saxophone in hand, a tuxedo-clad Stewart Sell (MD ’60) smiles alongside his bandmates in a photograph featured on their website (www.swingdocs.com). Swing Docs, a band that Sell started in the 1990s, has played shows in upstate New York for the past 25 years as a cohort of health care providers/musicians. This year, they lost their founder and their alto sax lead when Sell died in June at 88.

Sell, a groundbreaking liver cancer pathologist and stem cell researcher, spent a 50-year-plus career studying “the cellular evolution that leads from a normal cell to a cancer cell, providing ideas and hypotheses, most of them proven,” as his colleague and Pitt’s former chair of pathology George K. Michalopoulos, Distinguished Professor, describes it. Sell’s career began at Pitt Med, where he earned his medical degree as his father, surgeon Oliver Sell (MD ’26) had. (The elder Sell was a Pitt Med professor from 1945-55.) Sell also started his research career at Pitt Med, studying under Frank Dixon, MD chair of pathology during the 1950s, who is considered the founder of immunopathology.

Sell returned to Pitt for five years as a faculty member after completing his pathology residency at Massachusetts General Hospital and postgraduate research fellowships at the National Institutes of Health and in Birmingham, England. After subsequently working at the University of California, San Diego, and the University of Texas Health

Science Center at Houston, he joined the faculty at Albany Medical College as director of the Division of Experimental Pathology in 2003, where he remained until he retired. For his work developing the test for alpha-fetoprotein, which allows screening for birth defects and has contributed to a better understanding of liver cancer’s root cause, Pitt honored Sell as a Legacy Laureate in 2005.

Sell’s colleagues remember him as a driving force in cancer research, particularly in cancer stem cells—and as an exacting investigator. Former Pitt Med student and faculty member Bryon Petersen (PhD ’96), a famed stem cell scientist now at the University of Florida, recalls that “Stewart would hold your feet to the fire to defend the research, but he’d also give praise and acknowledgment for the work.”

His generous spirit is also remembered. Pitt associate professor of medicine and hematologist-oncologist Richard Steinman (Res ’90, Fel ’92), an MD, PhD, recalls Sell as “brightening the eyes of the students he met,” whether in the lecture hall or after a Scope and Scalpel performance.

While the Swing Docs will honor Sell in perpetuity through their music, his research legacy is preserved at Pitt Med. In 2019, he and his family established the Sell Family Physician Scientist Award, which recognizes students training to be physician scientists.

—Rachel Mennies

IN MEMORIAM

'50s

GEORGE GERNETH, MD '53

AUG. 7, 2023

JOHN HUMPHREYS JR., MD '56

JULY 17, 2023

MARY MEINDL, MS '58

AUG. 1, 2023

'60s

H. LEE DAMESHEK, RES '68

JULY 1, 2023

STEPHEN KAPELNER, MD '68

AUG. 22, 2023

STEWART SELL, MD '60

JUNE 16, 2023

WILLIAM TROYER JR., MD '60

JUNE 20, 2023

'70s

CHARLES HAAS JR., MD '72

JUNE 22, 2023

CHARLES KELLY JR.

MD '75, RES '78

JUNE 7, 2023

ROBERT SWANSIGER, MD '72

JULY 26, 2023

'80s

STUART WEINBERG,

RES '88, FEL '88

JULY 18, 2023

'10s

LAURA JEAN VICCARO,

MD '11, RES '14

JULY 15, 2023

FACULTY

JOHN DOYLE, MD '74, RES '78

AUG. 15, 2023

SAMUEL GRANOWITZ, MD '58, RES '65

AUG. 15, 2023

DENA HOFKOSH, MD

SEPT. 26, 2023

RICHARD W. MORIARTY,

MD '66, RES '69, FEL '70, RES '71

SEPT. 7, 2023

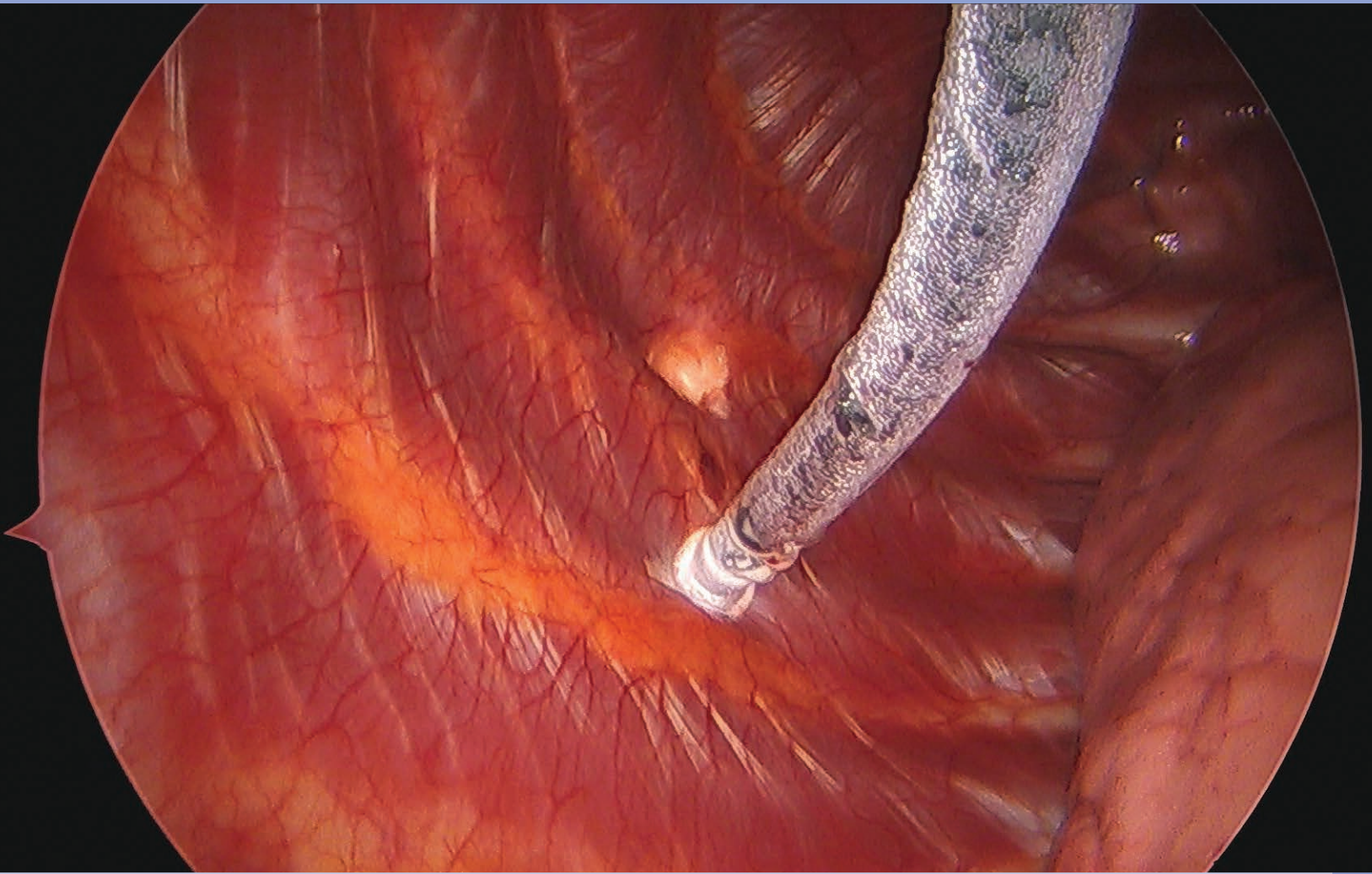
H. ANDREW WISSINGER, MD '56

AUG. 3, 2023

MICHAEL ZIGMOND, PHD

AUG. 28, 2023

Please send In Memoriam notices to mia97@pitt.edu.



During repair of a teenager's chest, a cryoprobe numbs pain between the ribs by freezing nerves at -87 degrees Fahrenheit.

FOR REAL! TWEEN SCIENCE



Some cold, hard facts: If the outside temperature is -30 degrees Fahrenheit (-34 degrees Celsius), people's body temperature can drop to dangerous levels in minutes. If our body temp were to go below 70 degrees, we'd be in real trouble; normally, we're around a cozy 98.6.

But the human body can withstand even colder temps from the inside. In fact, some doctors use "cryoanalgesia," a fancy word for applying super-cold temperatures to numb pain. They can freeze nerve endings in an ice ball, keeping the brain's signals from hitting the nerve. That's called a nerve block, and the interruption can last several weeks to even months.

"How cold?" you might ask. Well, freezing the body's nerves requires temperatures around -87 degrees Fahrenheit. Brrrrr.

People have been using cold to lessen pain since the time of Hippocrates in ancient Greece, around 460-377 BCE. Many centuries later, Napoleon's soldiers had painless amputations performed on them at subzero temperatures in Russia.

Then in 1917, a German surgeon named Friedrich Trendelenburg froze the nerves of patients in one of the first instances of modern cryotherapy. Today, cryoanalgesia freezes tissue with tiny ice crystals, using chemicals like nitrous oxide delivered by a tiny needle, or "cryoprobe."

Freezing nerve endings can give a person temporary pain relief without injury because it only freezes the very outside layer of a nerve while keeping the inside intact. This means the nerve can grow back because it retains the building-block layers to regenerate.

Cryoanalgesia is an exciting field for surgeons. It has been shown to be more effective during surgery than opioids and other pain medications that carry high risk, especially for kids and teens. And that's just the tip of the iceberg! —Vivian Wang

Thanks to Pitt's Stefan Scholz, an MD, PhD assistant professor of surgery and the director of minimally invasive surgery at UPMC Children's Hospital of Pittsburgh, for his insights. Scholz's professional interests include using the latest regional anesthesia methods to minimize pain after surgery for children and other super-cool stuff.

CALENDAR

FOR ALUMNI & FRIENDS

For information:
Alex Rigby
at +1-412-789-5866
or hsalumni@pitt.edu

VIRTUAL HEALTH ACADEMY
NOVEMBER 21

MAA ALUMNI AND STUDENT
NETWORKING
DECEMBER 1

Alan Magee Scaife Hall

VANSCOY WINTER ACADEMY
FEBRUARY 15, 2024

Naples, Florida

For more events at the medical school:
pi.tt/medcalendar

Support the people and institutions you love



It's time to create or update your estate plan.

Use our complimentary Personal Estate Planning Kit to:

- Take full advantage of current tax laws.
- Account for family changes.
- Realign shifting charitable priorities.

Revise your estate plan before the end of the year to protect your assets and establish your legacy.

Download the free Personal Estate Planning Kit today at plannedgiving.pitt.edu/planning-toolkit or talk to a member of our planned giving staff at pae-pg@pitt.edu or +1 888-353-9604.



Get your free Personal Estate Planning Kit



University of
Pittsburgh

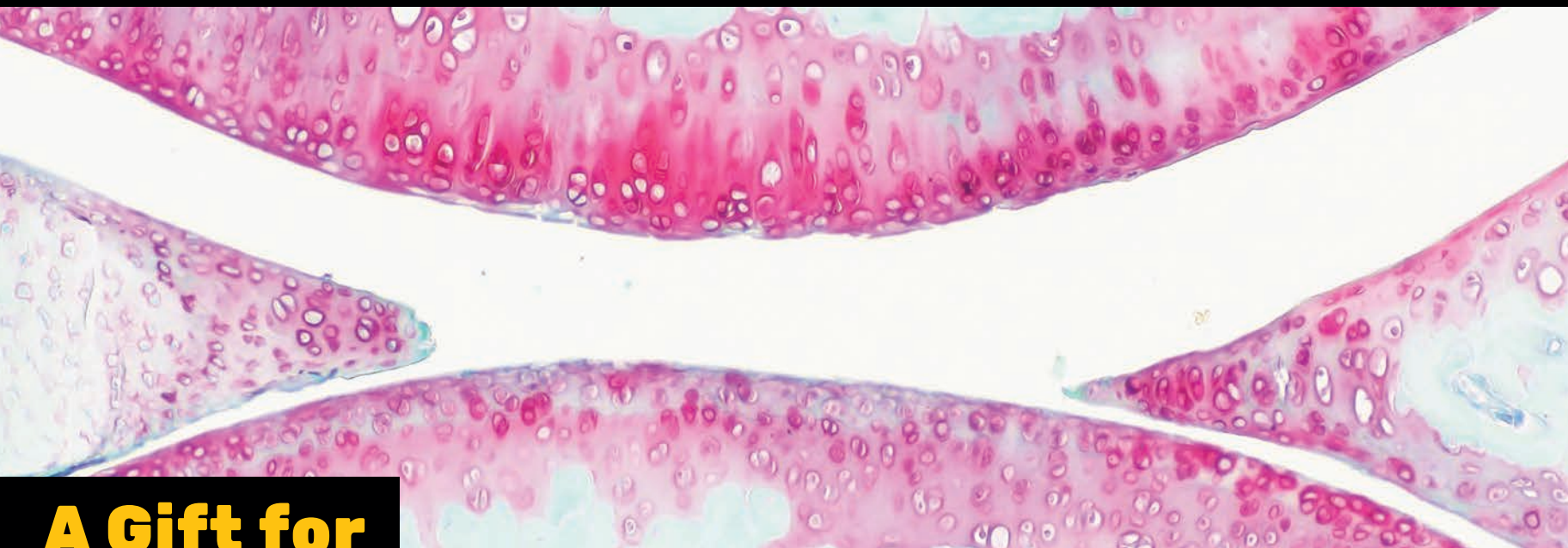
Office of Planned Giving



Pitt Med Trivia *(from page 37)*

- Answers:**
1. Men's basketball
 2. Jonas Salk
 3. 1892
 4. Monongahela
 5. Olde Frothingstosh

A new center positions Pitt Med to make musculoskeletal medicine a major focus, thanks to a gift from Orland Bethel's foundation and a match from the University. Shown here: the pathogenesis of osteoarthritis. (Courtesy Hang Lin, School of Medicine)



A Gift for Generations

More than ruining his weekend golf game, the acute pain in Orland Bethel's neck and shoulders affected his ability to work efficiently, and work is something he takes much more seriously than golf, even at 86.

For the man who says, "My whole history of life has been the drive to get out and work," being sidelined wasn't easy to accept. He negotiated the pain until it put him in a wheelchair, because he couldn't move his arms or legs without distress.

That's when Bethel, founder of Hillandale Farms, one of the country's largest egg producers, turned to Pitt's Joon Lee, an MD and Orland Bethel Professor in Spine Surgery, Department of Orthopaedic Surgery, for relief. Lee had completed a procedure on Bethel in 2014 at UPMC Presbyterian to treat spinal stenosis. Lee's skill and genuine concern, and the success of that earlier procedure, prompted Bethel to seek his continued care.

The surgery on Bethel's neck in 2016 restored his movement and relieved his pain. A grateful Bethel gave a gift to the University in 2019 to endow the professorship Lee holds.

But Bethel was inspired to do more, and in September he pledged \$25 million to Pitt through the Orland Bethel Family Foundation to be matched equally by the University. The funds enable Pitt to elevate its study of musculoskeletal disorders by creating the Orland Bethel Family Musculoskeletal Research Center (BMRC).

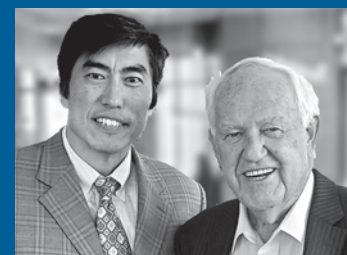
"When you get to this level, it's a generational gift, a trans-

formative gift," Lee says. "The influence of this gift will be felt across the entire system—from young medical school students, through accomplished researchers, on to [those making] improvements in patient care."

The gift launches an array of programs under the new center's umbrella: the BMRC Core Laboratories, Bethel Research Fellows and an annual conference and seminar. Among the participating entities in the center are the Departments of Orthopaedic Surgery and of Physical Medicine and Rehabilitation in the School of Medicine, McGowan Institute for Regenerative Medicine, School of Health and Rehabilitation Sciences, Swanson School of Engineering and Pittsburgh Center for Pain Research.

Anantha Shekhar, senior vice chancellor for the health sciences at Pitt and the John and Gertrude Petersen Dean of the School of Medicine, says, "The center will support clinicians, investigators, trainees and students in areas that will bring hope to the hundreds of thousands who face [musculoskeletal] problems every day."

To make a gift to the medical school:
giveto.pitt.edu/medmaggive
Or call Jen Gabler: +1-412-864-5547



Lee (left) with Bethel