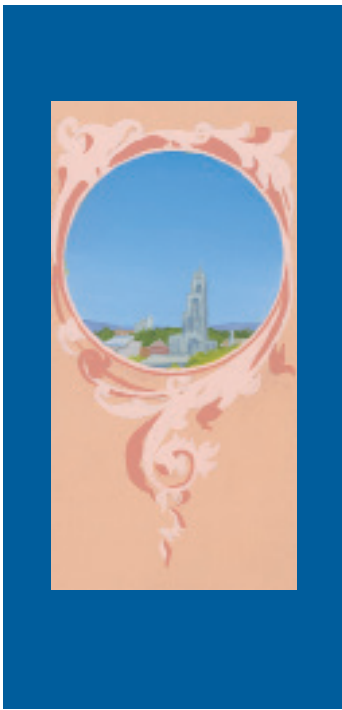


OF NOTE

Devoted to noteworthy happenings
at the medical school



WARREN JAGGER

FCD

FOOTNOTE

“Both schizophrenia and addiction threw my musical ambitions off track,” says guitarist David Baird. Recently, though, playing in a band with others with schizophrenia has offered him long-term structure, rich relationships and the chance to perform in front of an audience. The group, called Infinity, was formed by Baird and fellow musicians Susan Padilla, Anne Alter and Barry Mills, with support from Pitt psychiatrist K.N. Roy Chengappa and Flavio Chamis, a conductor and composer. In November, Infinity performed at the 39th Pittsburgh Schizophrenia Conference.

Check out a short documentary about the band:
[SHORTLINK TK]

PITT NO. 3 IN NIH FUNDING

The National Institutes of Health is backing Pitt Med researchers in a big way. NIH grants to the medical school in fiscal year 2022 surged from an already enviable \$475 million to \$550 million. The increase in 2022 follows a \$33 million jump in NIH funding in fiscal year 2021.

“The last two years’ major increases are thanks to the innovation and dedication of our Pitt Med faculty and staff,” says Anantha Shekhar, Pitt’s senior vice chancellor for the health sciences and John and Gertrude Petersen Dean of the School of Medicine. “We’re further cementing our place among the top academic medical institutions in the country.”

The numbers place the University of Pittsburgh as the No. 3 ranked recipient of NIH funding for 2022, up from No. 11 in 2021. The University as a whole landed \$675 million in NIH awards, a 13% increase from the previous year. The School of Medicine, whose NIH grants make up 81% of the University’s total, moves from No. 11 to No. 6.

Pitt Med researchers also excelled in receiving especially large awards: Grants of \$10 million or more increased from 6 in 2021 to 11 in 2022, while grants from \$5 million to \$10 million grew from 13 to 20. All of Pitt’s awards in these high-dollar ranges went to the School of Medicine. —*Staff reports*



GETTY IMAGES

New insight on why teens are likely to take so many risks.

A balancing act in teen brains

Teens often make choices that confound the adults in their lives. Sometimes they might seem to inhabit a different universe, where consequences are an afterthought in the pursuit of new, exciting experiences. Recent findings from Pitt scientists point to one possible reason for the divide: A critical period of neuroplasticity in the adolescent brain.

As described in a paper published in *Progress in Neurobiology*, the researchers looked at the balance of two brain chemicals—glutamate and gamma-aminobutyric acid (GABA)—in the prefrontal cortex. Neurons use glutamate to send activation, or excitatory, signals across their branches, while GABA dampens them and inhibits brain activation.



Luna

Using high-resolution live brain imaging on 144 participants, the researchers found that as adolescents age toward adulthood, glutamate levels taper off, and the two neurotransmitters come into balance.

The research, supported by the National Institutes of Health and the Staunton Farm Foundation, offers new understanding about adolescents' heightened sensation-seeking, which allows them to gain the new experiences needed to specialize the brain (that is, engage and solidify its circuitry) in adulthood. But it can also lead to potentially life-threatening, risk-taking behaviors that begin with the onset of puberty. What's more, major mental illnesses such as depression and schizophrenia often first emerge during this time.

"This paper provides biological evidence for what we have all suspected regarding adolescent behavior," says senior author Beatriz Luna, a PhD, the Staunton Distinguished Professor of Psychiatry and Pediatrics and a professor of psychology at Pitt. "Adolescence is the time when cognition becomes specialized in supporting the transition to adulthood and determining lifetime brain development trajectories." Yet that development can be derailed, as in the case of mental illness, she adds.

Critical periods of neuroplasticity—when the brain is especially sensitive to changes—involve high excitatory function in relation to inhibitory function, which signals that neural systems must reorganize to regain balance. Scientists have previously identified critical neuroplasticity periods during infancy and childhood, but this study offers the first evidence of profound plasticity in the frontal cortex during adolescence.

"It's important to study foundational changes in the brain that drive the transition from adolescence to adulthood," says lead author Maria Perica, a PhD candidate in clinical psychology at Pitt. "Incomplete knowledge about normative brain development limits our understanding of what drives some of the changes we see clinically." —*Staff reports*

SOWA ELECTED TO NATIONAL ACADEMY OF MEDICINE



Sowa

Gwendolyn Sowa, an MD, PhD, who is the Endowed Professor of Physical Medicine and Rehabilitation, as well as chair of that department and director of the UPMC Rehabilitation Institute, has been elected to the National Academy of Medicine.

Sowa codirects the Ferguson Laboratory for Orthopaedic and Spine Research at Pitt, where she leads a diverse group of scientists working together to develop treatments for spine conditions and low back pain. The clinician scientist also holds joint appointments in orthopaedic surgery at the med school and in bioengineering in the Swanson School of Engineering.

"This is an incredible honor, and I am humbled to be in such great company," says Sowa. —*Staff reports*



UNIVERSITY OF PITTSBURGH

Overheard with Chancellor Gallagher Magic happens when a university turns outward.

This summer, after nine years in the role, Patrick Gallagher will step down as Pitt’s 18th chancellor. Under his leadership, Pitt has strengthened its status as one of the nation’s premier public insti-

tutions for higher education and research, including being named a top public school in the nation by U.S. News & World Report.

The former director of the National Institute for Standards and Technology came to the University after two decades in public service, drawn by what he calls the “best mission on the planet”—i.e., making the world a better place through knowledge and understanding.

For Gallagher, fulfilling that mission has meant bringing different people together to address problems in new ways. During his time as chancellor, Pitt has formed new partnerships focused on innovation, entrepreneurship and community engagement. Those alliances have expanded the reach of the University’s research breakthroughs and expertise.

Such partnerships are especially important in the health sciences, which Gallagher calls “a heartbeat of the university.” The outgoing chancellor spoke with Pitt Med to reflect on his tenure and the unique opportunities universities present.

FACTCHECKING PROOF

Nine Years Later

Chancellor Patrick Gallagher announced in April 2022 that he plans to step down this summer. Gallagher’s tenure saw Pitt evolve as much as the world around it. Facing new challenges and rising toward new ambitions, the University made major strides. We highlight several here.

KEY:

- Expanded mission
- Access and affordability
- Health and safety
- Infrastructure investments

FEBRUARY 2014: Patrick Gallagher becomes the 18th chancellor of the University of Pittsburgh, succeeding Mark A. Nordenberg.

MAY 2015: Pitt appoints its inaugural vice chancellor for diversity and inclusion. During Gallagher’s tenure, the racial and ethnic diversity of Pitt employees increases by 58%.

APRIL 2017: The new Office of the Senior Vice Chancellor for Research strengthens Pitt’s push to grow research funding. Today, the University receives more than \$1 billion a year.

JUNE 2017: Pittsburgh Public Scholars offers all valedictorians and salutatorians in Pittsburgh Public Schools guaranteed admission to the Pitt campus of their choice.

SEPTEMBER 2017: The School of Computing and Information enrolls its first cohort of students, preparing them for the workforce’s growing demand for technological proficiency across fields.

JUNE 2018: The Opioid Abuse Prevention and Recovery Task Force forms to address the growing substance abuse crisis and support prevention, treatment and recovery programs.

OCTOBER 2018: Pitt’s first Community Engagement Center opens in Homewood. “A front door to Pitt in neighborhoods,” the centers strengthen the University’s connection to the community. A second opened in the Hill District in 2021.

Pitt Med: First, congratulations. You've done so much in your time here. What initiatives here at Pitt are closest to your heart?

Patrick Gallagher: It's always hard for me to answer that, because it's like picking your favorite child. I prefer to just take joy in the whole family.

[That said] I have a fondness in my heart for trying to turn the viewpoint of the University a little bit more outward than inward—looking at ways in which the University's impact is there, even if you're not a student or a member of the University community. [Editor's note: See the timeline below for a few examples.]

I think most people are drawn to a university because they want to make a difference. And that's individually true in the context of your studies, discipline or work. But I think it's also collectively true: that our city, our region, our country should be better off because we're here. And that, for me, is the real magic of what drew us all here, right? Like bugs around a lantern.

Pitt Med: In Pittsburgh and Pennsylvania, there are pockets that are thriving, and there are pockets, sometimes just down the street, that are left behind, in terms of equity or economic opportunity. How can a university make a difference?

PG: The intrinsic thing that we have as a university is deep expertise. We also have something that's often forgotten, but really important: We're a place to experiment, to try something new. With that comes this ability to convene and form partnerships. It's no accident that many of the public-private partnerships, the newest companies, the nonprofits are often catalyzed out of efforts that started and were incubated in universities. A university is in the position to put the band together, if you will, to tackle a

Continued on page 33.

DECEMBER 2018: **Panthers Forward** welcomes its inaugural class—students who receive \$5,000 in debt relief as well as mentorship from Pitt alumni. As of fall 2022, the program had helped 600 students pay off \$3.75 million in debt.

OCTOBER 2019: **The Pitt Success program** restructures financial aid by matching the U.S. Department of Education's Pell Grants dollar for dollar across all five Pitt campuses.

SPRING 2020: Pitt launches **COVID-prevention and response efforts**, focusing on mitigation, communication and targeted surveillance testing. The University's approach has been studied as a possible model for other institutions to refer to in the future.

MAY 2022: **The Assembly** opens in a former Model T factory in Bloomfield, bringing researchers of diverse disciplines together to build the next generation of cancer treatments.

SEPTEMBER 2022: **The Campus Wellness and Recreation Center** breaks ground. The 270,000-square-foot facility will feature a recreation pool, jogging track, weight-lifting equipment and courts for basketball and volleyball.

SEPTEMBER 2022: A new, 5,500-square-foot building opens for the **Big Idea Center**, Pitt's hub for student inventiveness and entrepreneurship. The health sciences schools are also a major source of commercialization for the University. Leaders are establishing partnerships and an ecosystem for further life sciences innovation.



Sydney Sharp in Geneva. As a physician, she'll also want to help shape policy.

COURTESY S. SHARP

At the table

When Sydney Sharp applied to a global policy program in Geneva, she wasn't sure what to expect. But that was the point.

"I wanted to do something completely new, outside of my wheelhouse," says the Pitt medical student, now in her second year.

Her time in Duke University's Global Policy Program in Geneva last summer ended up strengthening a longstanding curiosity. Dual undergraduate majors in biology and African American studies at the University of Maryland had piqued her interest in systemic solutions to health inequities. To Sharp, the summer before her second year of med school seemed like a last chance to dip her toes into the health policy waters before an intense slate of classes, research and rotations focused her path.

"When will I ever have the chance in the rest of my training to move to Switzerland for two months and learn from the crème de la crème of the public policy sphere?" she thought.

Her experience in the program included an internship with the Joint United Nations Programme on HIV/AIDS (UNAIDS). Sharp took part in the organization's efforts to decriminalize HIV and AIDS exposure, transmission and disclosure. And at the 50th regular session of the Human Rights Council and the 2022 International AIDS Conference, she helped plan UNAIDS panels and prepare talking points.

"I got to see the bigger picture of how Geneva functions, with organizations working together to achieve a goal," Sharp says. One challenge, she saw, is bringing together different countries and cultures to address a question. "There's no one-size-fits-all solution," she says.

It turns out she has a knack for policy. As part of the program's intensive course week, Sharp's group won a case competition about health care for refugees in Poland. At a conference this April, she is a finalist in a poster competition and will present a policy mapping project she worked on for UNAIDS.

The trip wasn't all work: Sharp bonded with other program participants while hanging out at the Bains des Pâquis, eating Gruyère and visiting the Matterhorn. "I was not only having this great educational experience—I was living life," she says. "This is what the world is like outside of the lecture room!"

Sharp didn't have much time to reflect before the start of the fall semester. But she's now seriously considering a step-out year from medical school to pursue a Master of Public Policy. "There is space for physicians in policy," she says. "Bringing yourself to the table is very valuable." —Andrew Doerfler

Faculty Snapshots

Thuy Bui received the Arnold P. Gold Foundation's 2022 Pearl Birnbaum Hurwitz Humanism in Healthcare Award for her decades of work advancing the well-being of underserved populations, immigrants and refugees.

Bui, an MD professor of medicine, has been director of the Global Health and Underserved Populations Residency Track at Pitt Med and UPMC for more than 15 years.

Her work is motivated in part by her own life story: After leaving her native Vietnam at 11 years old, she and her family stayed at a refugee camp in Malaysia before arriving in the United States. Bui later entered the Peace Corps and served as head of the Medical Department of Kamuzu Central Hospital, Lilongwe, Malawi, for two years; she maintains relationships in the country and works to further education opportunities and health services there.

Until 2017, she headed the Birmingham Free Clinic. She still sees patients there weekly.



Bui

J. Timothy Greenamyre, won the 2022 Robert A. Pritzker Prize for Leadership in Parkinson's Research, among the field's most prestigious honors. Greenamyre is the Love Family Professor and vice chair of neurology at Pitt Med and director of the Pittsburgh Institute for Neurodegenerative Diseases.

Awarded by the Michael J. Fox Foundation for Parkinson's Research, the prize recognizes Greenamyre's extensive contributions to our understanding of the disease. His research into genetic and environmental factors helped demonstrate that pesticides like rotenone and paraquat contribute to the disease. The rotenone model he developed continues to inform other researchers studying the causes of—and treatments for—Parkinson's disease.

Greenamyre, an MD, PhD, also added to the evidence suggesting that mitochondrial function could go awry in Parkinson's.

"My relationship with my patients is what motivates me," says Greenamyre.

Alok Joglekar received the National Institutes of Health (NIH) Director's New Innovator Award, which supports early career scientists pursuing unconventional approaches to major challenges.

Joglekar is a PhD assistant professor of immunology and member of the Center for Systems Immunology. He and his team engineer molecules to manipulate the T cells in the immune system, boosting their ability to fight cancer and keeping them from attacking healthy tissues. Typically, T cells respond to target cells when their receptors recognize antigens displayed on molecules; Joglekar's engineered molecules allow other immune cells to respond and influence T cell function.

"We've essentially converted a one-way street into a two-way," Joglekar says. He hopes the research will lead to new treatments for diseases such as type 1 diabetes and multiple sclerosis and enhance immunotherapies for tumors.

The award, Joglekar says, "allows us to dive head-first into these ideas and gives us a cushion for taking risks." —Staff reports



Greenamyre



Joglekar

ALL OF US RETURNS GENOMIC DATA

These days, tools like smart watch-based health apps allow people to become more engaged in their own care—and, hopefully, improve their well-being. Now, the National Institutes of Health's All of Us research program is adding to the individualized toolbelt. The massive effort, which aims to build a database based on genomic sequences and other health-related information from 1 million volunteers, is expected to catalyze biomedical research and change how health care is delivered. It's also offering a direct return on investment for participants.

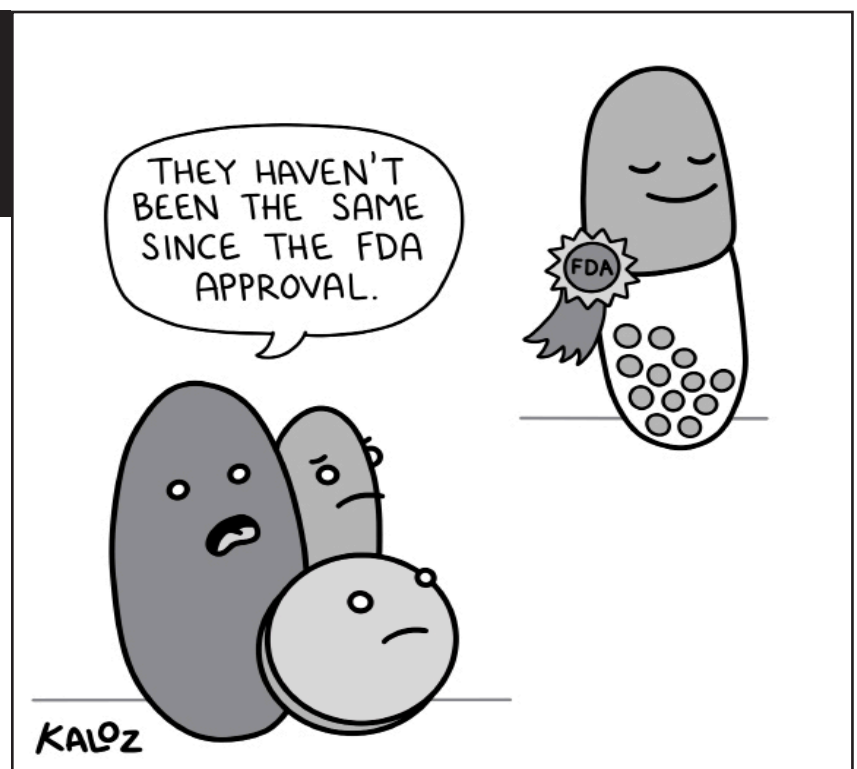
In November 2022, All of Us began returning health-related genomic results to participants. The reports include information about pharmacogenomics (how genes affect a person's response to medications) and hereditary disease risk.

Steven Reis, an MD, Pitt's vice chancellor for multidisciplinary innovations in the health sciences and director of the Clinical and Translational Science Institute (CTSI), leads the Pennsylvania arm of the study. The very first All of Us national participants enrolled at Pitt back in 2017; now, they are some of the first receiving results.

As partners in genomic testing, participants can opt in to receive results—and decide which ones they receive. The information should serve as "a conversation-starter between participants and their health care providers," says Philip Empey, a PharmD, PhD associate professor of pharmacy and therapeutics and part of Pitt's All of Us team.

He adds that Pitt programs are training local providers to understand results and "be on the cutting-edge of precision medicine." At the same time, Pitt's CTSI team is guiding investigators interested in applying for NIH funds to start analyzing the data coming out of All of Us. —Micaela Corn

ASIDE



by Tara Kaloz

LIGHT WORK

The risks that come with invasively measuring intracranial pressure can be catastrophic enough that it's ruled out for many patients who would benefit from the information.

Michael McDowell, an MD assistant professor of neurological surgery, and his collaborator Jana Kainerstorfer, a PhD at Carnegie Mellon University, have an alternative. They're developing a device no bigger than a credit card that attaches to the patient's forehead, without a procedure or incision, by either a headband or adhesive.

Once it's secured, near-infrared light passes heatlessly and painlessly through the skin and skull to reach blood vessels in the brain. The light is then temporarily absorbed by hemoglobin within the blood cells. The hemoglobin releases the light, which then makes its way back to the device. The operator calculates the distance the blood cell traveled in the time between absorbing and releasing the light. Fluctuations in blood flow correspond with changes in intracranial pressure.

A preliminary study of 15 children at UPMC Children's Hospital of Pittsburgh found that the device's results closely matched those of the more invasive method. McDowell hopes that "by the end of 2023, we will have a large-scale observational trial in adults and children at a multicenter level."

By making intracranial brain pressure measurement faster and safer, the device may also help physicians discover new, useful applications for brain pressure monitoring.

LOSING CONTACT

The key to simpler vital sign measurement may already be in your pocket. Michael Pinsky, an MD professor of critical care medicine, and his team have developed a noncontact pulse oximeter app compatible with any Android smartphone. Unlike the standard finger-clip style device for blood oxygen saturation, the app uses a smartphone camera to provide the same information.

Every time your heart beats, the color of your skin changes slightly, getting a little redder. The app detects such changes in a tiny area of a patient's forehead to determine pulse rate. Other changes in light density indicate the patient's respiratory rate. In tests, the app has returned these measurements accurately regardless of the person's skin pigmentation. Based on an analysis of the pulse and respiration data, the app determines blood oxygen saturation.

Once the FDA approves the technology, it could be used potentially assess the vitals of unconscious victims in disaster scenarios, give health information to previously unreachable communities and even allow patients to collect measurements in the waiting room before an appointment—reducing the chances of exposing medical staff to infections.

Says Pinsky, "My critical care professional colleagues around the world have called it a game-changer."

Heads up on new devices

Recognizing that some tools used to assess patients aren't ideal for all situations, and some are simply too risky, two Pitt Med professors and their teams are developing technologies to offer alternatives. Although these are separate initiatives, both approaches happen to look to the forehead to collect this important information.

— Nicole Matthews

—Illustration by Frank Harris