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]
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.

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

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

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

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

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 institutions 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.

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.

FACTCHECKING
PROOF

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.
ASIDE

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

Facility 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.

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
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