NOT-SO-SECRET AGENTS

Certain infectious agents, such as herpes simplex viruses (HSV) 1 and 2, cytomegalovirus (CMV), and the protozoan Toxoplasma gondii, can infiltrate nerve cells, and these infiltrators have long been accused of speeding cognitive decline.

A paper in December's Alzheimer Disease & Associated Disorders clarified this connection. Vishwajit Nimgaonkar, an MD/PhD professor of psychiatry and human genetics; Mary Ganguli, an MD/MPH professor of psychiatry, epidemiology, and neurology; Chung-Chou Chang, a PhD professor of medicine, biostatistics, and clinical and translational sciences; and colleagues assessed the mental acuity of more than 1,000 seniors throughout five years. They found that although HSV-1 doesn't seem to be implicated in attention, language, and memory issues in older adults, HSV-2, CMV, and T. gondii are associated.

"[This result] points us in a new direction," says Ganguli, "and could open up possibilities for both prevention and treatment. Clinical trials could test the effectiveness of antiviral medication to ward off decline, and public health experts could develop strategies for preventing exposure in the first place."

—Jennifer Larson

FOOTNOTE

Pitt’s School of Medicine and Graduate School of Public Health faculty amassed more than $414 million from the National Institutes of Health last year, ranking fifth in the nation overall. That cash is a hefty chunk of the University's total NIH funding—at $475 million, up $19 million from 2014. Pitt’s total places us above the University of Michigan, UCLA, University of Washington, and Stanford University, to name a few notable peers.

Presidental Praise for Pitt

This February, Tina Goldstein, a PhD associate professor of psychiatry and director of psychotherapy for pediatric mood disorders at the University of Pittsburgh, received the U.S. government's highest honor for young scientists—the Presidential Early Career Award for Scientists and Engineers (PECASE). She and the other winners celebrated the honor with President Barack Obama at the White House this May.

Goldstein’s studies of treatment for adolescents with bipolar disorder and suicide prevention in that population are supported by nearly $2.5 million in grants from the National Institute of Mental Health.

Pitt’s Ervin Sejdic, assistant professor of electrical and computer engineering and of bioengineering, and Elizabeth Skidmore, an associate professor and chair of occupational therapy, both PhDs, also received PECASE awards. The School of Medicine’s first winner, in 2000, was Karl Kandler, a PhD, UPMC Professor of Auditory Development and Plasticity, professor of otolaryngology and neurobiology, and director of the auditory research group. Overall, seven Pitt faculty members have been PECASE awardees. —Robyn K. Coggins
Faculty Snapshots

The University of Pittsburgh School of Medicine boasts two recipients of the National Cancer Institute’s Outstanding Investigator Award this year, which provides funding throughout seven years. (Pitt’s Thomas Kensler, a PhD, received the award last year.)

Olivera Finn will use her $6.2 million in Outstanding Investigator funding to support the development of new cancer vaccines. A Distinguished Professor of Immunology and Surgery, Finn investigates the ways our bodies identify and fight cancer. Finn, a PhD, was the founding chair of Pitt’s Department of Immunology. She also received the American Association of Immunologists Lifetime Achievement Award this year.

Patrick Moore will use his $6.4 million of funding to support his investigations into how viruses turn normal cells into cancer, among other areas of cancer virology. Moore, an MD/MPH who is the American Cancer Society Distinguished Professor of Microbiology and Molecular Genetics, leads the University of Pittsburgh Cancer Institute’s Cancer Virology Program and holds the Pittsburgh Foundation Chair in Innovative Cancer Research.

The Association for Psychological Science has named Rebecca Price a “Rising Star.” Codirector of the Pittsburgh Neuroimaging and Treatment Outcome Lab, Price works at the intersection of clinical and neuropsychological research. She develops novel ways to treat anxiety, depression, and suicidality using computer-based interventions and pharmacological approaches. Price is a PhD assistant professor of psychiatry.

Carl Snyderman presented the Semon Lecture to the Royal Society of Medicine in London. The November 2015 lecture was titled “Paradigm Shifts in Skull Base Surgery and the Creative Process.” Snyderman, an MD professor of otolaryngology and neurological surgery, is codirector of the Center for Cranial Base Surgery at UPMC. He is internationally recognized for helping to develop a technique to remove brain tumors through the nose with an endoscope, which limits trauma to the brain, eliminates scars from facial incisions, and shortens recovery times.

—Elizabeth Hoover

Overheard: Fluid Dynamics

In 2003, Michael Moritz (shown above), an MD, and his fellowship mentor, Juan Carlos Ayus, rocked the parenteral nutrition boat with a paper in Pediatrics. They presented evidence against the use of hypotonic IV solution (fluid with less sodium than a patient’s plasma)—a practice that had been entrenched in pediatric hospital care for 50 years. They argued that the solution could cause hyponatremia, or low sodium levels, and eventually neurological problems and death. Today, Moritz says, “over 20 prospective studies in over 2,000 children” have proven him right—that isotonic fluid, with sodium concentration matching patient plasma, is appropriate for most patients.

Moritz, now clinical director of pediatric nephrology at Children’s Hospital of Pittsburgh of UPMC and professor of pediatrics, published an October review article in the New England Journal of Medicine about the physiological principles of IV fluid selection. “Changing fluid practice is a simple and safe measure which can be taken to improve patient safety and will save lives,” he says.

What made you realize that a change in IV solution administration was needed?

Dr. Ayus and I observed that almost all hospitalized patients were at risk for hyponatremia from elevated hormone levels that prohibit the kidneys from releasing water. With that, I wanted to know why hypotonic IV solution became standard of care. There was really no data to support the practice—it was based on the sodium concentration of breast milk and cow’s milk.

What tactics did you take to manage the controversy?

Physicians were fearful that isotonic fluids would cause fluid overload and hyponatremia [high sodium levels]. We thought, if we repeat our message and explain it in very clear terms, eventually it would catch on. We wrote letters to the editor, commentaries, and reviews correcting misconceptions. Fortunately, this sparked a renewed interest in the topic, and investigators around the world began conducting studies and verifying our concept. Now, societies are developing consensus guidelines on fluid therapy in children and adults, when before there were none.

—Interview by Kristin Bundy
Flashback

Happy birthday, Scaife Hall!
Construction of the building began in 1954 with the help of $15 million in grants from the Sarah Mellon Scaife Foundation, the A.W. Mellon Educational and Charitable Trust, and the Richard King Mellon Foundation. In 1956, the building, designed by the architectural firm Schmidt, Garden, and Erikson, opened to students and faculty. Scaife Hall may be 60, but it’s nowhere near retirement: School officials are raising funds for a brightly lit west wing addition with student lounges, classrooms, and labs.

Pride in the Curriculum

Jason Rosenstock, MD associate professor of psychiatry and director of that department’s medical student education program, knows that patients identifying as lesbian, gay, bisexual, transgender, or queer (LGBTQ) can experience implicit or overt bias when seeking care. Lack of provider awareness about recommended treatments and screenings, such as Pap smears to detect cervical cancer in transgender men, or limited insurance coverage for LGBTQ-specific needs, can be roadblocks to appropriate care. Even an intake form that only offers MALE or FEMALE for gender options can make some patients reluctant to visit the doctor.

Rosenstock, Dena Hofkosh, an MD and associate dean for faculty affairs, Christopher David, a third-year medical student, and others have been working with Pitt med course directors to integrate more LGBTQ-related content into the curriculum to ensure responsible and competent care for LGBTQ patients. During the Behavioral Medicine course, for instance, med students now discuss the case of an 18-year-old transgender woman dealing with depression. And as part of the Medical Interviewing course, students now encounter cases involving well-functioning and healthy same-sex couples to present normative examples of LGBTQ lives. Kristen Eckstrand, an MD/PhD and second-year resident in psychiatry who coedited a clinical guide to LGBTQ health care, believes that more opportunities for students to rotate at centers with higher proportions of LGBTQ patients is an important component of students’ training.

Hofkosh, Eckstrand, David, and Rosenstock are members of Pitt’s PRIDE Health, a collection of more than 200 students, faculty, and staff focused on patient care and other issues faced by the LGBTQ community in medicine. (They also advocate for individuals born with differences of sex development.) PRIDE’s efforts, Rosenstock says, will “improve the climate to make more individual physicians and medical practices welcoming and culturally proficient in the care of LGBTQ patients and their families.” —Rachel Mennies and Robyn K. Coggins

Top Physician-Scientists

Six Pitt physician-scientists were recently inducted into two vaunted organizations—the Association of American Physicians (AAP) and the American Society for Clinical Investigation (ASCI).

William Osler and six other physicians established AAP in 1885; it recognizes standout clinical and basic science researchers who are contributing to the pursuit of medical knowledge and its clinical application. Pitt inductees include David Brent, an MD, professor of psychiatry, pediatrics, and epidemiology, and Professor of Suicide Studies; Brian Zuckerbraun, an MD and the Henry T. Bahnson Professor of Surgery; and Anne Newman, an MD/MPH, epidemiology department chair, director of the Center for Aging and Population Health, and the Katherine M. Detre Professor of Population Health Sciences.

ASCI is a physician-scientist honor society created in 1908 for investigators under the age of 50 who successfully convert laboratory results into innovative clinical practice. This year its new members include Pitt’s Caterina Rosano, an MD/MPH and professor of epidemiology; Bernhard Kühn, an MD/PhD, associate professor of pediatrics, and director of research for pediatric cardiology; and Stephen Chan, an MD/PhD, associate professor of medicine, and director of the Center for Pulmonary Vascular Biology and Medicine. —Ali Greenholt
Once a month at St. Louise de Marillac Parish in Upper St. Clair, about 25 women gather to measure, cut, and sew with purpose. Their product: robes for women undergoing treatment for breast cancer. The garments are made from scrubs patterns, with slits on the front and sides held together by Velcro.

“The Velcro opening allows the patient to expose only the part of the breast that has to have radiation treatment. This helps keep them covered instead of lying there totally exposed like hospital gowns would do,” says Karen Radu (pictured above), founder of the group at St. Louise de Marillac.

The seamstresses got their start in 2009, after Radu heard about Arlene Segar of Monroeville making these comfy robes. She shared her patterns, and since then the St. Louise ladies have fashioned 5,000 robes for hospitals in the Pittsburgh area, including UPMC Shadyside, UPMC Jameson, and others. Radu and her crew work solely from donations and grants; one of their biggest donors is Magee-Womens Hospital of UPMC.

The volunteers slip a well-wishing card into each robe pocket; that often spurs a call or a thank-you card from the women undergoing treatment.

“I always share the notes and letters with the group when we meet,” says Radu. “It brings all of us to tears most of the time; [the volunteers] know how much they are appreciated.” —Kristin Bundy

Next Generation

The Howard Hughes Medical Institute (HHMI) annually funds students to conduct a yearlong stint of “basic, translational, or applied biomedical research” as they pursue an MD degree. This year, 79 research fellows were chosen, five of whom are Pitt Physician Scientist Training Program students expected to earn their MDs in 2019.

Pooja Karukonda, with mentor Christopher Bakkenist, a PhD, hopes to “change the paradigm of [cancer] therapy” by shifting the focus to the body's own defense mechanism, the immune system. Because certain immune-system cells are vital to cancer-destroying effects after radiation, Karukonda is investigating whether radiation can actually activate the immune system to jump-start the natural healing process.

Thiagarajan (Thiagu) Meyyappan studies type 1 diabetes, in which the immune system destroys its own insulin-producing cells. Meyyappan, mentored by Jon Piganelli, a PhD, and Steven Little, a PhD, uses regulatory T cells to try to combat this irregular immune system function while also maintaining normal immune responses to viruses and bacteria.

Wai Lok Tsang and mentor Thanos Tzounopoulos, a PhD, are chasing phantoms—phantom sounds, that is. Tinnitus, affecting nearly 15 percent of the population, causes people to perceive sounds, such as ringing, buzzing, or static, that aren't actually there. Though tinnitus currently has no cure, Tzounopoulos and Tsang hypothesize that zinc can suppress the neurotransmitters that cause hyperactivity in an auditory region of the brain stem, perhaps eradicating the irritating noises.

Mondira Ray, motivated by experiences with cancer patients, wants to “help bridge the gap between cause and cure.” As part of the Big Data for Better Health project, Ray, with mentors Ziv Bar-Joseph of Carnegie Mellon University and Pitt’s Rebecca Jacobson, an MD, is integrating genomic cancer data into revamped computational models to produce better strategies for preventing, diagnosing, and treating breast and lung cancer. Using algorithms that analyze electronic health records, machine-learning programs can use those data to predict clinical outcomes, resulting in better patient care.

Tolani Olonisakin, with mentor Janet S. Lee, an MD, is one of 13 HHMI fellows nationally returning for a second year. Olonisakin is studying how a protein produced predominantly by platelets interacts with neutrophils, the first responders of the immune system. Olonisakin says understanding this interaction is critical to developing a drug that effectively targets these molecules, which she hopes could help fight the “urgent threat” of antibiotic resistance. —Ali Greenholt
If you're looking for Maggie Wright outside of the laboratory, you might need to call her by her derby name, “Poppin’ Fresh.”

Wright—a neuroscience PhD and postdoctoral researcher in the lab of H. Richard Koerber, PhD professor of neurobiology—is also a competitor with the Steel City Roller Derby, captaining the Allegheny Avengers and skating on the league’s A-team, Steel Hurtin’. (She’s shown above in the yellow jersey, calmly checking an opponent from the Indianapolis Naptown Roller Girls.)

“Derby,” says Wright, “has been a great outlet for me as a physical activity—as well as an opportunity to meet some amazing people.”

Wright has been competing since 2012; she got her start in Cleveland while attending Case Western Reserve University.

Wright’s dissertation, defended in February, focused on the development and maintenance of Merkel cells—skin cells that help us sense touch. She currently studies how such somatosensory receptors regain function after injury.

Neuroscience and roller derby may seem to have little in common; but Wright says the two complement each other, as each requires serious patience and mental fortitude.

Wright’s off-rink avocation has a fringe element, as well—that’s yarn-bombing, a street art wherein bombers create cozies for bike racks, cars, trees, bridges, whatever strikes their fancy. Wright also happily engages in more traditional knitting projects: “I’ve done a lot of hats, socks, baby blankets, gloves, and an ear cover that fits around my bike helmet for the winter months.”

— Rachel Mennies
—Photo by Karl Zemlin