

*Devoted to noteworthy happenings*

*at the medical school*

CAMI MESA



Warren and Mark Shlomchik

## Hello ... Flu Shots

**Imagine a crowded room of people who are social to a fault. They're all close-talkers who, with unwashed hands, touch people a lot. They sneeze and cough without covering their mouths. And worst of all, they have nearly no immunity to any type of viral infection. This is not a nightmare sequence from an episode of "Seinfeld." It's a description of child care centers in America. And according to new research, the vast majority of centers don't require children or employees to receive a flu shot.**

**Timothy Shope, professor of pediatrics at Pitt, and his team interviewed 518 child care center directors in the country. They found that only a quarter of these centers required flu vaccinations for children, and even fewer, 13%, required that staff members get flu shots.**

**Shope says this is a policy failure—only four states have influenza vaccine laws for child care—that reflects how the public views the flu in relation to other diseases.**

**"Parents and society have a healthy respect for diseases like measles and polio, and they should," Shope says. He warns that influenza is also dangerous—2 in every 1,000 people with influenza died in the 2018–19 season. (Somewhere between 1 and 3 children in 1,000 who become infected with measles die.)**

**The U.S. Centers for Disease Control and Prevention, which funded Shope's research, recommends flu shots for everyone 6 months of age or older. But nationally, influenza immunization rates hover below 50%.**

**Shope worries that the ongoing pandemic might overshadow the dangers surrounding the upcoming flu season. If that happens, he believes children and child care professionals could pose a health risk this winter as COVID-19 continues to spread.**

**"We don't want our emergency departments and hospitals to be overrun with people with influenza," he says. "We also really don't want to find out what it's like to be infected with both influenza and SARS-CoV-2."**

***—Evan Bowen-Gaddy and John Hansen***

## On the Mark

It's been known for years that the immune system can kill cancer cells. The catch is that its assassins (T cells) must be very exacting. The target changes with every single tumor and person. You want to find the antigens derived from the genetic mutations that turn a normal cell into a cancerous one.

Brothers and Pitt immunology all-stars Mark Shlomchik (shown right) and Warren Shlomchik (shown left) have recently started a company with seed funding from UPMC to find those targets and T cells so that they are specific to each patient. Their company, BlueSphere Bio, uses robotics to sift through thousands of T cells from a patient's tumor to determine which of those cells already know the mutated antigens in that patient's cancer. This way, they can create an army of T cells that know exactly where to strike.

Mark, who is chair of immunology, says this is a breakthrough since, up until now, T-cell research has been looking for common targets between tumors but not patient-specific ones. Warren, director of Hematopoietic Stem Cell Transplant and Cell Therapy, adds: "Most of the mutations that we want to target are incidental to the process of developing cancer, which differs in every tumor; so it has to be a product that's developed on an individual basis."

Other advantages of their method: "We think it's about 50 times cheaper than previous technologies and maybe 100 times faster," notes Mark. "We can look at 1,000 T cells in a day with minimal hands-on [effort]. With previous technology, that would take probably months and lots of individual effort." *—EBG*

## FOOTNOTE

**Research isn't free. That's why UPMC Enterprises—the venture capital and commercialization arm of UPMC—plans to invest $1 billion to develop new drugs, diagnostics and devices by 2024. The commitment includes the $200 million that was invested in Pitt investigators' research in 2018 to help establish the UPMC Immune Transplant and Therapy Center. The 10-digit investment stands to boost the work of physician-scientists like Toren Finkel, who cofounded Generian, a startup focused on healthy aging, as well as Mark and Warren Shlomchik, who cofounded a startup that you can read about on this page. Stay tuned for more promising ventures.**



AIMEE OBIDZINSKI/UNIVERSITY OF PITTSBURGH

# Overheard

## Our Antibiotics Pipeline is in Danger

**A great deal of modern medicine relies on antibiotics. We're not just talking about routine infections. Nearly every patient who undergoes surgery, as well as every transplant and chemotherapy patient, depends on effective antibiotics to prevent or treat infection. Like many in his field, Cornelius J. Clancy, Pitt associate professor of medicine, has grown alarmed by the increase in antibiotic-resistant infections, also known as superbugs, over the past decade. Clancy is also director of the Extensively Drug Resistant Pathogen Laboratory in Pitt's Division of Infectious Diseases. Recently, he analyzed antibiotic prescriptions—from throughout the nation—for treating a superbug. He came to some troubling realizations.**

### What did you learn from your study on antibiotics?

We've long known that [the last-line antibiotic] polymyxins are not very effective in terms of curing infection, and that they also carry major toxicity. What we found is, although new drugs have come out to improve both patient outcomes and lower toxicity, their uptake by hospitals has been slow but steady. It's taken about four to five years for them to finally begin to surpass the polymyxins in use against superbug infections nationwide. And we're not sure what the reason for that is, but the cost of the new antibiotics could be an issue. They are more expensive.

The marketplace is broken. There is little money to be made in the development of new antibiotics. A new antibiotic that covers resistant pathogens is really only going to be used against those resistant pathogens, meaning its use is infrequent. Reimbursement in the U.S. system is based on units dispensed, and it's just impossible on a per-unit basis for anyone to make money developing antibiotics. And, there are plenty of spaces within medicine where you can develop drugs and make a lot of money.

### What can happen if antibiotics are no longer viable?

If antibiotic-resistant infections continue to increase, and we have more untreatable infections, or ones that are only treatable with one or two antibiotics, it could get to a point that a lot of what we do in day-to-day medicine becomes too risky. If we revert to a time before antibiotics were in use, then, for a patient with an infection, it's just going to be a matter of how the infection turns out based on their own immune system and their own ability to fight it off.

### What needs to happen to ensure we continue to develop new antibiotics?

We need a reimbursement model that captures the societal benefit of antibiotics. We need to de-link the value of the antibiotic from the absolute use of that antibiotic. *—Nichole Faina*

## Next Generation

**Since their first year at Pitt Med, Noah Pyles and James O'Brien have gotten into long, inquisitive conversations that often end with, what they call, "napkin calculations." Last summer, one discussion concluded with an eye-opening estimation: In their combined 14 years of lab work, they had probably disposed of tens of thousands of pounds of single-use plastics.**

**Pyles and O'Brien, who are in their third year at Pitt Med, wondered: "What kind of footprint does that leave on the environment?" They determined that, this year, the United States will dispose of around 3 billion pounds of medical plastic that wasn't recycled beforehand.**

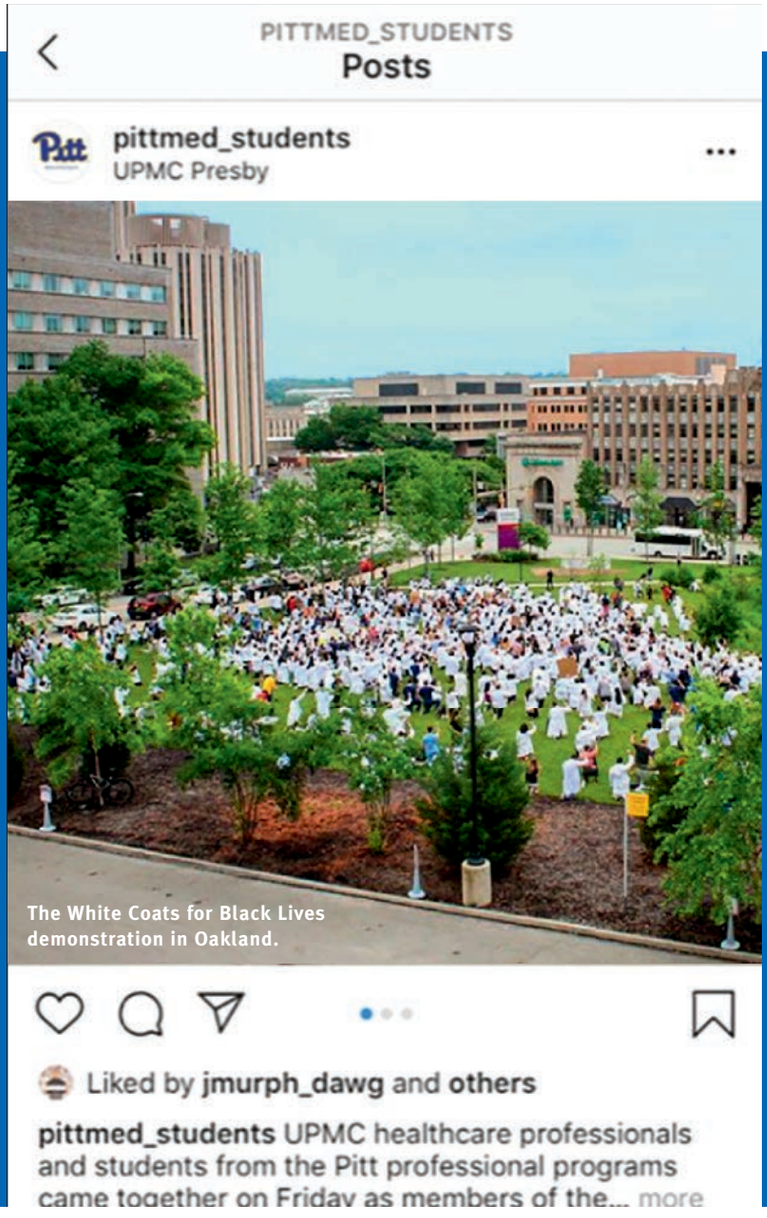
**Inspired to provide a solution to this problem, Pyles and O'Brien created Polycarbin, a recycling system for medical plastic; and this year, they won first place and $25,000 at Pitt's Randall Family Big Idea Competition for their salvaging company. Their system installs sorting bins in research labs, then hauls polypropylene waste to a facility to be cleaned and recycled.**

**O'Brien and Pyles, who bonded as roommates during their first year at Pitt Med, are co-CEOs in the company and wear nearly every hat. Pyles says their "interests and abilities form a very nice Venn diagram." Pyles focuses more on product development and researching user experience, while O'Brien is the networking guru. Once they have attracted enough investors, they plan to launch the platform at a commercial scale.**

**As part of their pitch to investors, Pyles says they point out that medical plastic requires nearly twice the energy to dispose of than the kind people toss in a bin under their kitchen sink. Production and disposal of medical plastic in the United States also sends about 4 megatons of $CO_2$ into the air each year. And its incineration is carcinogenic.**

**"When [O'Brien] and I are talking to investors, we like to describe the biomedical plastic economy as one of the largest ecological problems that no one has probably heard of," Pyles says.**

**"And one of the largest public health problems no one has heard of," O'Brien adds.** *—EBG*




The White Coats for Black Lives demonstration in Oakland.



Sarah Atta

## Worth Following

What's it like to be enrolled at Pitt Med these days? The Office of Student Affairs and Diversity Programs launched an ambassadors program in 2019 so students from a range of backgrounds can tell their stories. Haniah Zaheer (Class of 2023), Maria Evankovich (Class of 2023), Spencer Talentino (Class of 2023), Joe Murphy (Class of 2022), Sarah Atta (Class of 2024) and Victoria Humphrey (Class of 2021) share Instagram and Facebook accounts, where—in the pre-COVID-19 days—they posted photos of study sessions with classmates, early morning trips to the gym, their favorite Pitt Med faculty and staff, the beauty of Pittsburgh and the like. More recently, they've shown ways Pitt Med students have helped the community during the pandemic and protested racial injustices.

"The platforms serve a dual purpose of highlighting some of the amazing people and activities Pitt Med has to offer, while also helping pre-med students along their journey," says Humphrey. "We love when they reach out to us and ask questions."

Start following them, and you'll get hooked! See @pittmed_students on Instagram and www.facebook.com/pittmedstudents on Facebook. *—GJ*

## Doctor-to-Be



Humphrey

**Victoria Humphrey** is a third-year Pitt Med student who takes pride in how she balances academics with community involvement. On top of her role as a student ambassador (see above), she's treasurer for the Class of 2021, and she also runs Snacks for STEM, a nonprofit organization that gives healthy treats to children at Pittsburgh Fulton PreK-5 in the city's Highland Park neighborhood (with Camille Davis, a fellow third-year student). Snacks for STEM evolved out of Apples 4 Education, a similar non-profit that Humphrey, 27, founded when she competed for Miss Florida (she placed second runner-up). Though the former Miss University of Miami was raised in Tampa Bay, attending Pitt Med has been her dream since she was a little girl. Her grandfather Hugh Raymond Primas Jr. (DMD '47, MPH '69) served as an inspiration. As a professor in Pitt's Graduate School of Public Health, Primas Jr. taught and advocated for improving health standards throughout central and southern Africa.

Humphrey is hoping to pursue a residency in dermatology. Representation matters to her, and because only about 3% of dermatologists in America are Black, Humphrey is particularly interested in serving low-income Black and Hispanic patients: "Disease presentation on a patient with fairer skin can look completely different from a patient with darker skin, and it often goes undiagnosed or misdiagnosed." *—GJ*