

THE GEORGE WASHINGTON UNIVERSITY
SCHOOL OF MEDICINE AND HEALTH SCIENCES

Medicine + Health

FALL 2016



BELIEVE

GW researchers lead a five-year, multimillion-dollar grant to explore immunotherapy as a means to end HIV.

A NOTE FROM ROSS HALL



Dear members of the SMHS community,

BELIEVE is the acronym for the title of the landmark \$28 million, five-year National Institutes of Health grant awarded to GW School of Medicine and Health Sciences (SMHS) faculty members to work toward a cure for HIV/AIDS. Of course, it also reflects the confidence that this remarkable team of researchers and clinicians has to advance our knowledge of the immune system and our ability to clear HIV from the body.

Believe is also the theme of this edition of *Medicine + Health*. What links these articles is our collective belief in the SMHS mission and in our outstanding students, residents, fellows, faculty, alumni, and staff. These stories reflect the amazing work that takes place at SMHS every day.

Whether you gain inspiration from our diverse student body and residents in pursuit of their calling to be leaders in medicine and health care; are excited by the advances in the basic sciences, translational or clinical research; or are moved by the impact that our faculty and alumni have on the communities in which we serve, I hope that you find reasons to believe in SMHS and make gift to support these efforts.

Philanthropy is an important way for you to express your belief in SMHS. An unrestricted gift or a gift made to the dean's discretionary fund will be used for student scholarships — my number one priority. However, our terrific faculty also require support for their efforts to create innovative teaching models, to perform groundbreaking research, and to provide cutting-edge clinical care. Giving opportunities are unlimited. If something in this edition does not match your interests, I encourage you to pull up the school's website (smhs.gwu.edu) and see what else is taking place at SMHS.

Warmest regards,

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MAKING THE ROUNDS



Welcoming Walter Harris

The GW School of Medicine and Health Sciences (SMHS) has tapped Walter

Harris, M.B.A., PMP, as the senior associate dean for administration and operations, a new position within the Office of the Vice President for Health Affairs and Dean of SMHS. Harris comes from the U.S. Food and Drug Administration, where he served as the deputy commissioner for operations and chief operating officer. At SMHS, he will spearhead business and management efforts designed to balance strategic and operational initiatives. He will also be responsible for SMHS operations and administration, including communications, strategic planning, financial planning and accounting, information technology, human resources, facilities, and safety and security.

Harris has won multiple awards and honors, including the Executive Leadership in Government Award from the Association for Federal Information Resource Management, the Top Blacks in Healthcare Award from BlackDoctors.org, and the Centers for Disease Control Directors Award. He also served as a sergeant in the United States Air Force and was selected as the Pentagon liaison to Secretary of Defense Caspar Weinberger.

"Coming to the GW School of Medicine and Health Sciences is a wonderful next step in my career," Harris said. "I am pleased to be joining a dynamic team." ■

The Next Chapter

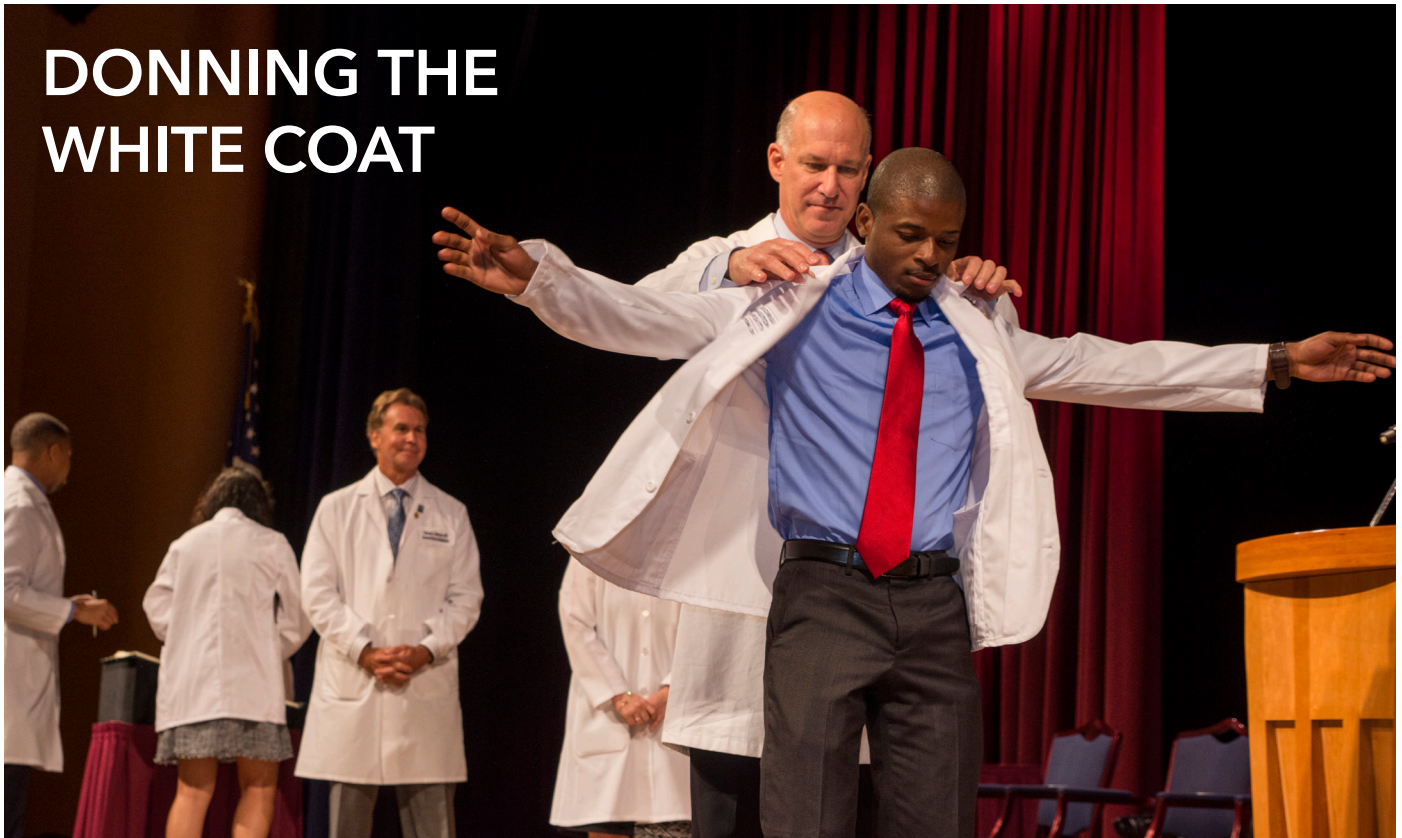
It's an oft-used metaphor, but in the case of GW School of Medicine and Health Sciences students, it's apt: Graduation is the end of a chapter in a long story of health care. For medicine and health sciences students, it's a narrative of intense study, little sleep, and immense personal growth.

As the graduates of 2016 learned, the next act of their professional lives hinges on their ability to build on their skills and knowledge, and their

compassion and collaboration, as they move to residencies, internships, and clinical care.

"[Your story] is only partially written, but it's off to a great start," M.D. program graduation keynote speaker Jonathan B. Perlin, M.D., Ph.D., M.S.H.A., MACP, FACMI, president of clinical services and chief medical officer of the Hospital Corporation of America. "Bravo!" ■

DONNING THE WHITE COAT



The white coat: a piece of fabric whose meaning belies its simplicity. It represents a responsibility to patients; a commitment to healing; and a passion for the craft of medicine. For new students, slipping into the white coat also signifies entry into the profession, a milestone treated with ceremony.

First-year M.D. program students formally donned their white coats in early August; physician assistants, as well as incoming residents, received their white coats in late June. Physical therapy (PT) students, with help from second- and third-year PT students, put on theirs in the fall.

"This has been the last eight years of my life, trying to get to this point, and it feels like a dream that I really don't want to wake up from," said first-year M.D. student Paola Mancera at her ceremony. "I'm on the verge of crying and trying not to cry this soon, but it is the most surreal experience." ■



Meron Rezene, a senior at E.L. Haynes Public Charter School in Washington, D.C., waits to deliver a baby in the Clinical Learning And Simulation Skills Center during the annual four-week DC Health and Academic Preparation Program (DC HAPP). The program, designed to immerse rising high school seniors in the field of medicine, includes lectures, poster presentations, and hands-on activities, such as lessons in suturing and CPR training. The DC HAPP cohort also receives white coats, a symbol of entry into health care, in a special ceremony.

Practical Medicine in the Historical Setting

Students in the GW School of Medicine and Health Sciences (SMHS) M.D. program could easily be spotted among the deluge of people eager to attend the opening of the National Museum of African American History and Culture, but they weren't there as spectators. Instead, the students and SMHS faculty were on hand to provide an important service during the historic event.

The GW Medical Faculty Associates (GW MFA) Department of Emergency Medicine was called upon to provide medical support at the event, and at least a half dozen medical students volunteered their time and services throughout the weekend, said Yolanda Haywood, M.D., RESD '87, B.A. '81, associate dean for diversity, inclusion, and student affairs at SMHS.

During the opening, students took blood pressure, attended to minor wounds, and assisted the medical team triaging the injured or ill attendees. The opportunity put students at the center of the action providing medical care at a large public event, Haywood said.

Jené Carter, a second-year medical student who volunteered at

the event, said she participated in order to put into practice the skills she had learned in class while also being part of "a huge, historic moment."

Washington, D.C. is a vibrant city full of events and festivals, and for GW medical students, volunteering at activities that only this city holds "is really valuable," Carter said.

She added that she felt a bit nervous about having the right skills required for whatever might come up, but found comfort in the sense of teamwork among the students, nurses, and providers. "Everyone was really collaborative," she said.

Occasions such as the museum opening, Haywood added, show students how much organization and skill is required to provide medical care at a large event. And with one so momentous, "just to be part of that was a great opportunity, no matter what your role was," she said.

GW students and staff will also play a role at an event that's completely unique to D.C.: the presidential inauguration.

The GW MFA Medical Reserve Corps (MRC), a medical response and disaster team, is gearing up for

the event, most recently holding an active shooter medical response drill in partnership with the U.S. Park Police, as well as D.C. police, fire, and EMS departments, among others, said Drew Maurano, PA-C, director of event and operational medicine and GW MRC, and associate clinical professor of emergency medicine at SMHS.

Faculty and staff took part in the drill, with about 15 medical and physician assistant (PA) students acting as responders, and more than 100 medical, nursing, and PA students playing the role of victims. Six SMHS faculty members were present to help lead the drill, Maurano said, praising the level of "involvement from the medical students and medical faculty."

Carter expressed interest in the drill, which she said is necessary because horrible things happen – and as an aspiring physician, it's important to be prepared for anything.

As for the part medical students and faculty will play at the inauguration and events surrounding it, that will come down to the needs of the inauguration committee put in place by the presidential transition team, Maurano said. ■



Service Learning: As part of the annual SMHS Community Service Day, first- and second-year M.D. program students, as well as doctor of physical therapy students, split into shifts to volunteer with a variety of organizations: Nourishment Now, Operation Smile, Best Buddies, the Children's Inn at the National Institutes of Health, and the Audubon Naturalist Society.

"I think [volunteering] is something not a lot of people take the time to step out of their comfort zone to do, so it was really nice to take that extra step and bring this to people's doorstep so they can see the impact that they're making in people's lives," said co-chair Robyn Frankel, a second-year medical student. "It's pretty meaningful."



Becoming “One GW”

From undertaking innovative research and treatment to educating health care professionals, the GW School of Medicine and Health Sciences (SMHS), the GW Hospital, and the GW Medical Faculty Associates have established a foundation of collaboration and achievement. Now, however, the three – under the umbrella “One GW” – are strengthening their bond with a new alignment and structure.

One GW has three goals: offering patients the most comprehensive and highest quality of care; training the next generation of medical professionals with technically advanced clinical techniques and modalities; and advancing biomedical, translational, and health services delivery research to improve patient outcomes.

This new approach will allow each medical entity to better combine its efforts and resources on key service lines and research opportunities. Additionally, One GW will empower

physicians to participate in a shared governance model, providing them with a more active role in decision-making and planning for success.

To celebrate the launch of One GW, the three entities welcomed nearly 4,000 employees, staff, residents, and students for a catered meal, complete with ginger-glazed pineapple and jerk pork, corn on the cob, and ice cream, held in the Eye Street Mall in mid-September. ■



Going Global on Regulatory Science

Industry experts, working professionals, and students from both the Regulatory Affairs Program at the GW School of Medicine and Health Sciences (SMHS) and abroad gathered in Foggy Bottom for the first international annual summer institute, “Issues & Trends in Regulatory Science.”

The event, organized through a collaboration between SMHS and the European Center of Pharmaceutical Medicine at the University of Basel, Switzerland, featured prominent industry leaders and discussions on topics like how health care products are cleared or approved for marketing; the future of drug and medical device innovations; how the reimbursement process works; pending legislation that might change the way health care is delivered; and the One Health Initiative that aims to improve health care for all.

“It was an invaluable experience,” said Emily Swanson-Parker, a class of 2017 student in the SMHS Regulatory Affairs program. “[This] wasn’t your run-of-the-mill professional conference, and I think that’s what made this conference stand out.” ■



MAKING THE ROUNDS



Yarne Glascoe poses in the gym where she works out, strengthening her body after surgery. A few months before, Glascoe received a kidney donation at the GW Transplant Institute at GW Hospital. Glascoe was one of several patients who received a new kidney this year. As of December 2016, the Transplant Institute, with surgeons J. Keith Melancon, M.D., chief of the GW Transplant Institute and professor of surgery at the GW School of Medicine and Health Sciences (SMHS); Thomas Jarrett, M.D., chair and professor of urology at SMHS; and Muralidharan Jagadeesan, M.B.B.S., associate professor of medicine at SMHS,

has performed more than 80 kidney transplants.

Working in concert with the GW Transplant Institute is the GW Ron and Joy Paul Kidney Center, which recently kicked off a major kidney health education campaign. Bus, television, radio, and digital media advertisements encouraging Washington, D.C. residents to check their kidney health will appear throughout the year. The campaign will also include information sessions and free screenings, particularly in Wards 7 and 8, where kidney disease is widespread.

New Head for Health Sciences

Reamer L. Bushardt, Pharm.D., PA-C, DFAAPA, tenured professor and chair of the Department of Physician Assistant (PA) Studies at Wake Forest Baptist Medical Center's School of Medicine, was named senior associate dean for health sciences at the GW School of Medicine and Health Sciences (SMHS). Bushardt will lead all health sciences departments at SMHS, including the departments of PA studies, physical therapy and health care sciences, clinical research and leadership, and integrated health sciences.

In addition to leading the Department of PA Studies at Wake Forest, Bushardt was a professor in the Department of Internal Medicine, professor and program leader in Wake Forest's Clinical Translational Science Institute, and professor in the W.G. Hefner VA Medical Center.

As an active researcher engaged in health workforce and educational research projects, Bushardt has published extensively on the education and training of health care professional

students and leaders, interprofessional education, and collaborative practice models. He also serves as editor-in-chief for the Journal of the American Academy of Physician Assistants.

Bushardt will assume the role of senior associate dean for health sciences on Jan. 1, 2017.

Stepping down from this position is Joseph Bocchino, Ed.D. '03, M.B.A., who served as senior associate dean for health sciences for the last four years. ■



Reamer L. Bushardt, Pharm.D., PA-C, DFAAPA



Passing with Flying Colors

Graduates from the GW School of Medicine and Health Sciences (SMHS) Physical Therapy (PT) Program have, for the seventh consecutive year, achieved a 100 percent first-time pass rate on the National Physical Therapy Examination (NPTE). The NPTE is a rigorous, comprehensive exam that all PT graduates must pass in order to be eligible for licensure.

"This level of success is exemplary and a testimony to our strong graduates, our excellent faculty, and a curriculum reflective of contemporary practice standards," said Joyce Maring, Ed.D., DPT, program director for the Doctor of Physical Therapy program and chair of the Department of Physical Therapy and Health Care Sciences at SMHS. ■

CELEBRATING A MILESTONE

BY CAROLINE TRENT-GURBUZ

The George Washington University Institute for Spirituality and Health (GWish), established in 2001 to promote whole-person care by integrating spirituality into health care and education, marked a milestone this year: its 15th anniversary. To commemorate the occasion, GWish welcomed members of the community, including political and academic luminaries, to a special dinner.

“I think 15 years is amazing,” said Kathryn M. Braeman, chair of the GWish Advisory Board, as she

acknowledged the work of GWish founder and director Christina Puchalski, M.D. '94, RESD '97, FACP, FAAHPM. “[Dr. Puchalski] has been a pioneer in creating awareness of the importance of spirituality in health. She is a visionary on a national and global scale.”

Thanks to Puchalski and GWish's efforts, spirituality is now recognized as a vital contributor to health — a prominent theme throughout the evening. In addition to Braeman's introduction, U.S. Representative Fred Upton from Michigan's 6th District and keynote speaker Robert Boisture, president and CEO of the Fetzer Institute, acknowledged the organization's work.

“We're here to celebrate a wonderful cause,” Boisture said. Those in attendance, he explained, though they may come from a variety of backgrounds, cultures, and religions, share a passion. “The common denominator, I think,” he said, “is compassion, is opening our hearts to the pain and suffering of the world with hope and a commitment to try to do something about it.”

With that compassion in mind, GWish presented its inaugural Excellence in Interprofessional

Betty Ferrell, Ph.D., M.A., FAAN, FPCN, CHPN



Christina Puchalski, M.D. '94, RESD '97, FACP, FAAHPM

Spiritual Care Award to Betty Ferrell, Ph.D., M.A., FAAN, FPCN, CHPN, director and professor in the Division of Nursing Research and Education, Department of Population Sciences, at City of Hope Hospital.

“I don't at all take this lightly, this recognition, because I know I'm in a room of many kindred spirits and people who are dedicated to ideas about love and spirituality,” Ferrell said. “I think for many of us in the room, there is the work we are asked to do every day, but deep within us there's the work that we were born to do.” That's the work, she said, that GWish does: attending to people's spiritual needs to help them heal and find hope. ■





KIMBERLY RUSSO:

On Learning, Goals, and Her New Role as CEO of GW Hospital

BY CAROLINE TRENT-GURBUZ

Kimberly Russo, M.B.A., M.S., pauses in the description of her hometown, White Hall, Illinois, population 1,100, to mock-gasp. “Everyone was like, ‘We have a stoplight!’” The flashing red light, which was installed when Russo was in high school, was “a very, very big deal,” she explains, laughing. But Russo wasn’t meant for life in a one-stoplight town, though rural health care has always remained near and dear to her heart. She did stay in her home state, at first, attending Illinois State University, then graduate school at Rush University and a fellowship in speech-language pathology at a Northwestern University affiliate, until opportunities steered her in another direction. Here, the new CEO and managing director of GW Hospital discusses the path that took her from clinical care to hospital management, what that means — or doesn’t mean — for women breaking through glass ceilings, and her vision for the hospital.

Q: Tell me about your transition from academia and clinical work to hospital administration.

A: I did my fellowship at a Northwestern affiliate for speech-language pathology/audiology and then my husband and I moved to the D.C. area for his career; I ultimately landed here at GW Hospital as a clinician and a bedside speech-language pathologist. I proceeded through the management path at GW, and I was actually in my Ph.D. program at the University of Maryland when I got some opportunities within GW; I really needed to take a leave of absence from my Ph.D. studies in order to pursue them. I made a critical decision and took a risk, which I think is sometimes part of leadership — you have to take those risks. I absolutely loved [going down the management path] and felt that I was making a larger impact and a difference in a very meaningful way.

I proceeded to administration and earned my M.B.A. during my first administrator role, feeling that I needed to go back and really continue to educate myself on the business and leadership philosophies. [I was then] chief operating officer for seven years and ultimately became the CEO following that stint in administration.

Q: What were you pursuing as your Ph.D.?

A: It was in speech-language pathology and audiology with a focus on neuropsychology and aphasiology. So, very interesting [laughs]. It really was on working memory, post-stroke, those types of things.

Q: What was it like switching from that to an M.B.A.?

A: You know, it’s a different animal, but I promised my husband it would be my last degree. I am very much an academician at heart and would be in school all the time if I could. I love higher education and learning, so for me, it was something I felt I needed for my own career path and also to

develop my knowledge and my critical thinking skills to really be successful in the administrative role.

Q: Do you miss clinical work with speech-language pathology?

A: I miss that direct patient contact and the clinical aspect of it. However, in this role, I feel that I'm able to fulfill that void by being out and about and rounding with the staff. I feel that my clinical background helps me not to be hesitant or nervous; I'm able to use my speech degree and communication to connect with patients in a more meaningful manner than is typical for administrators.

The staff are, to me, our most valuable asset, and we want to continue to develop and recognize and engage them to help us provide better service to our community.

Q: Does your clinical background make you, as an administrator, feel better able to handle whatever situations come up?

A: I think having the clinical background, coupled with the business education and the experience that I've been blessed to have throughout my career, has really shaped and prepared me for the role. I'm able to bring that clinical perspective and keep the patient in the forefront of all the decisions that we make. I pride myself on doing that. I do think it makes a little bit of a difference; I can understand some of the clinical "asks" as well as the business "asks" that come into this role, and it also helps me more easily navigate through the priorities.

Q: In terms of the hospital itself, what goals do you have?

A: GW Hospital wants to continue — and my vision is to continue — the real focus on our academic-quaternary-tertiary center and serving the community's needs during critical medicine and complex care. Being a quaternary center means that we are able to offer the D.C. region a level of specialized care that is not widely available elsewhere, including advanced technology and procedures.

As we continue to expand and increase our level of care, we remain committed to our alignment with the School of Medicine and Health Sciences as well as the GW Medical Faculty Associates. Together, we make up the GW clinical enterprise, and we are able to offer comprehensive, research-based care.

One area that we will focus on together in the coming years is our cancer program, which is a strategic initiative and growth imperative for the clinical enterprise. In addition to that, in order to really fulfill that academic-quaternary-tertiary vision, we have to continue to offer complex medical care, which

involves highly complex surgery, trauma, and transplants. That has to be [paired] with innovative research and bringing new technologies and new procedures to the region — that's really where the clinical enterprise is aligned, in pushing that vision.

Q: Why is the continued alignment with the GW School of Medicine and Health Sciences and the GW Medical Faculty Associates important to your vision?

A: As an academic medical center, we are committed to training the next generation of health care providers. The School of Medicine and Health Sciences is part of the fabric of who we are as a hospital. That strategic vision of alignment — being able to expand our footprint as an enterprise and provide the highest-quality service to meet the community's needs by offering greater accessibility — is key for that clinical enterprise.

Q: What valuable asset does GW Hospital bring to the table for that alignment?

A: We talk about the vision of the hospital, and we always have our business imperatives at the forefront of our mind — but I've been very focused on staff as well. I am committed to making GW Hospital not only a provider of choice for patients but also an employer of choice.

I think the staff are really the heart of this organization, and they are the reason we've been able to provide the care and the health care access to our patients. In an effort to engage staff, I've recently started an employee advisory council. They want to know that their voice is being heard, and it is my job as a leader to ensure that I am welcoming their ideas and addressing their concerns. The staff are, to me, our most valuable asset, and we want to continue to develop and recognize and engage them to help us provide better service to our community.

Q: There aren't too many female hospital CEOs. How do you feel about rising to this level? Do you feel like you've broken a glass ceiling?

A: I think it's important to constantly keep in the forefront of the mind that you're hired for your knowledge and skills and leadership to fulfill an objective. I have a pretty big objective to fulfill here as CEO. I don't think it's really about being male or female; it's about the skills that you bring to the table to fulfill those objectives at the time. It is absolutely a rare situation — between 1.6 and 2.6 percent of health care leaders are female CEOs, and there are about 5,700 hospitals in the nation — and I believe there are continued gender diversity issues within the health care industry.

It is, absolutely, a humbling experience. I'm very honored to be the CEO of GW Hospital and to be part of the clinical enterprise that I think is very strong, given that the medical school is one of the oldest in the nation and we have the largest faculty plan in the region. That, to me, is very humbling. ■



Going to Great Pains

The patient was addicted to heroin, recalls Katharine Hindle, M.D., assistant professor of anesthesiology and critical care medicine at the GW School of Medicine and Health Sciences (SMHS). GW Hospital staff screen all incoming emergency room patients for opioid and drug use — it’s standard operating procedure — and Hindle, in talking with the patient, found that he was actively using the drug. Digging deeper, she learned that he was self-medicating for hip pain.

“He was at the point where he was very candid about the fact that he didn’t want to continue,” she says. “His goal was to go home on no additional opioids.”

Managing his pain as part of that goal is precisely what Hindle and the Acute Pain Management Service, led by Paul Dangerfield, M.D. ’95, RESD ’02, B.S. ’89, assistant professor of anesthesiology and critical care medicine at SMHS, can offer. It is, Dangerfield says, the team’s small way of taking a bite out of opioid addiction.

Statistically speaking, opioid addiction has cracked the level of epidemic. Since 1999, sales of prescription painkillers — oxycodone, hydrocodone, morphine, fentanyl, codeine — have quadrupled, according to the Centers for Disease Control and Prevention. Four in five heroin users first become addicted by misusing painkillers, the American Society of Addiction Medicine reports, and drug overdose is the leading cause of accidental death in the country.

Using opioids, Dangerfield explains, is like treating pain with a hammer, rather than a needle: Opioids target pain “in a blunt way, in that they not only target the pain, but they target everything else,” he says, which can lead to undesirable side effects. Dangerfield also warns that bluntly targeting the pain doesn’t completely eliminate it, leading to an escalation in dosage, which puts the patient at higher risk for addiction and other negative side effects (nausea, vomiting, constipation, dysphoria). At GW Hospital, however, the Acute Pain Management Service is combining medications and techniques to more precisely target pain and reduce the need for opioids almost completely.

“We use a number of different medications that work in different ways on the pain, what we call regional anesthesia,” Dangerfield explains. “If people need it, they get opioids — but instead of that being the foundation of what we’re doing, our goal is, through this multimodal pain regime, [to give them fewer] opioids. If people aren’t exposed to them in the first place, they’re less likely to become addicted to them, and their pain is treated effectively.”

Multimodal Pain Management

- IV therapy (morphine)
- Anti-inflammatory
- Bupivacaine (epidural)
- Muscle relaxant
- Pills (opioids)

After being diagnosed with breast cancer, Robyne Doyle opted for the multimodal approach for her double mastectomy and breast reconstruction because, she says, “I know pain.”

Doyle was a nurse in the GW Hospital ICU for almost 30 years. “I think some people who are not in the medical field don’t have a grasp of how painful that surgery is,” she says. “I was fully aware. It’s not a walk in the park.”

Dangerfield treated Doyle with the paravertebral nerve block, a kind of regional anesthetic. Doyle had two small, flexible catheters inserted in her back, one on each side, that continually released medication over the course of a few days, a time period determined by the team. The catheters were connected to a softball-sized, portable bag of medication kept in pouches, which Doyle strapped around her waist.

Despite having opioids or painkillers on hand in case her postoperative pain became overwhelming, Doyle found that it was nearly nonexistent. “When I got home, I still wasn’t in pain. I mean, I’m toddling around — most people are down for the count for five to seven days, writhing in pain, can’t get out of bed, can’t move around; that’s just the nature of the mastectomy. Here, I’m hanging out with my kids, walking my kids to the bus stop, doing dishes the minute I get home.”

As Dangerfield explains, Doyle’s experience isn’t unusual: “Here’s someone who goes under, on a lot of different levels, a very significant surgery. She feels well enough to do [daily activities], as opposed to the patients who don’t get this [treatment] who are really laid up for a while and are not only miserable from the pain, but miserable from the side effects of the medication.”

Looking back, Doyle believes the multimodal approach was a kind of gift, a blessing even, that she learned was almost unique to her. “A few people — someone’s secretary or

someone’s sister-in-law — would get diagnosed, and I would tell them all about this procedure,” Doyle recalls. “Of course, they had never heard of it, and I almost felt bad talking about it because I felt like it was a special gift I had been given. I guess [although] GW does them, not every hospital does.”

GW Hospital, the Acute Pain team explains, is one of the few institutions using this multimodal approach — but not because it’s so “super-secret and super-special that we’re the only ones who can figure it out,” Dangerfield says. The issue, he says, is a lack of education on pain treatment options: combinations of the regional anesthetics, ketamine infusions, IV therapy, anti-inflammatories, and muscle relaxants.

To combat that lack of knowledge, SMHS has made pain management a component of the medical curriculum. Students rotate with the team for two to four weeks, and Marian Sherman, M.D. ’99, assistant professor of anesthesiology and critical care medicine at SMHS, lectures on the topic. Likewise, the team, says member Jessica Mersinger, an R.N. at GW Hospital, is “approachable and willing to educate, so we have residents who rotate through the service, who work with us managing the medications, and they take that back to their colleagues, [such as] the orthopedic team.”

“The Pain Cave,” as the Acute Pain team office is known, also has a reputation for luring in GW Hospital health care staff through treats — especially Oreos — in order to discuss pain management options. “Even if it’s not an official consult, people will know who we are and stop us and say, ‘What do you think about this? Could I try this, could I try that?’” Dangerfield says. “It’s being that Pied Piper to get as many people as possible to do what we do.”

The benefits of the Acute Pain Management Service extend far beyond just mitigating suffering for those undergoing surgery; surgeons who use the Acute Pain team find that their patients’ satisfaction increases, as does their practice, and patients feel cared for, thanks to the service’s 24/7 availability by phone and counseling options. It’s what makes the program special, Dangerfield adds: GW Hospital not only provides for the service, but also provides for support staff — four nurses and two nurse practitioners — to make sure patients receive comprehensive care at all times. “It’s truly what sets us apart,” he says. The team plans to add telemedicine soon, as well.

“If all hospitals had an acute pain service that treated those patients [addicted to opioids] effectively, there would be a lot fewer patients going out on the street with Price Club-sized containers of opioids or going out and getting street drugs to treat their pain because the doctors didn’t treat it correctly,” Dangerfield says. “One mistake did not get us here, and one correction is not going to get us out. But if every hospital adopted what we did, it would be a big step in getting ahead of the initial problem.” ■

SMHS Receives Full, Eight-Year Accreditation



The GW School of Medicine and Health Sciences (SMHS) received full accreditation for an eight-year term from the Liaison Committee on Medical Education (LCME), June 22. The accreditation process, which determines whether an M.D. program meets established LCME standards, involves an intensive three-day site visit. Programs must demonstrate that graduates exhibit professional competencies appropriate for the next stage of training, and those competencies need to serve as a foundation for lifelong learning and proficient medical care.

“This is an outstanding outcome — and I am grateful to the incredible team of students, faculty, staff, and deans who worked extremely hard to achieve this result,” says Jeffrey S.

Akman, M.D. ’81, RESD ’85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of SMHS.

The formal LCME report indicated that the SMHS M.D. program was in compliance with all accreditation standards, with two classified as “compliance in need of monitoring.”

“This was a remarkable accreditation survey that gives us much to be proud of,” says Richard J. Simons, M.D., senior associate dean for M.D. programs, who led the LCME accreditation effort for SMHS. “As we move forward, we will continue to strive for excellence on all levels of medical education.” ■

Translating OPPORTUNITY

GW's School of Medicine and Health Sciences, the Milken Institute School of Public Health at GW, and Children's National Health System Earn Renewal of their Five-Year Clinical and Translational Science Award

BY ERIC BUTTERMAN

What we learn about childhood diseases today can potentially affect present efforts in fighting ailments plaguing adults — and the partnership between the George Washington University (GW) School of Medicine and Health Sciences (SMHS), the Milken Institute School of Public Health at GW, and Children's National Health System (Children's National) is allowing for significant strides, thanks to the Clinical and Translational Science Award (CTSA).

The \$23 million grant represents not just a five-year extension to the original award the partnering institutions received in 2010, but it also is an expansion of the organizations' original goals: enhancing clinical and translational research; overcoming research barriers and promoting collaborative research; providing research training; and focusing on health disparities and childhood forerunners to adult diseases.

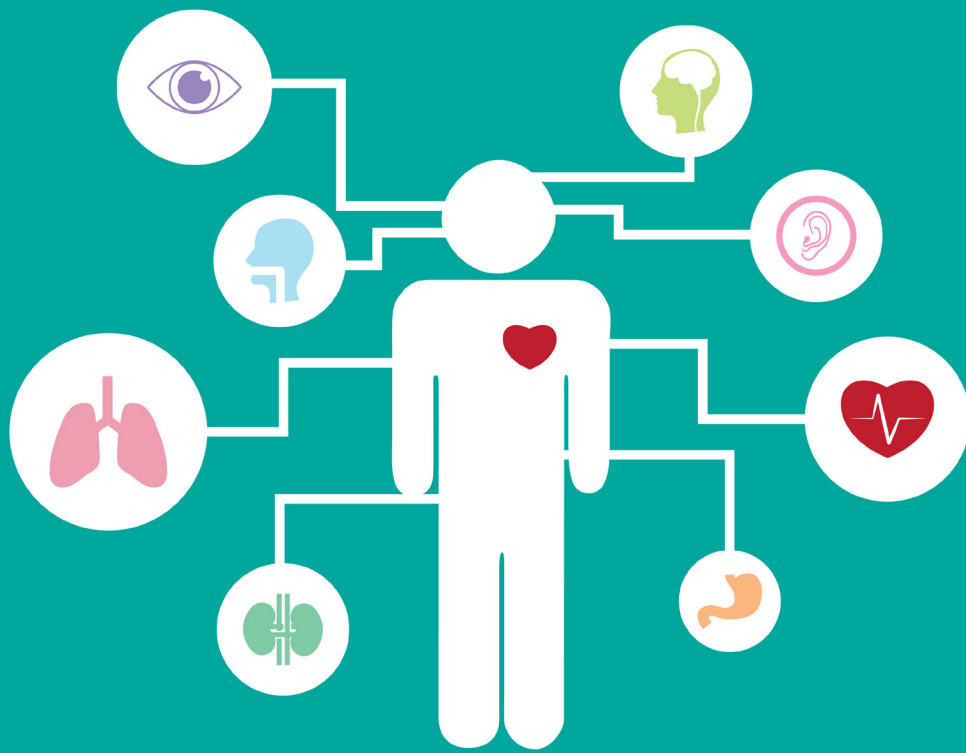
The partnership, known as the Clinical and Translational Science Institute at Children's National (CTSI-CN), continues

to be the only CTSA program out of the 64 in the nation with an emphasis on children, according to Robert Miller, Ph.D., senior associate dean for research, Vivian Gill Distinguished Research Professor, and professor of anatomy and regenerative biology at SMHS.

Lisa Guay-Woodford, M.D., director of the CTSI-CN, Richard L. Hudson Professor of Pediatrics at Children's National, and associate vice president for clinical and translational research at GW, says the second version of the CTSA will answer a few central questions: What are the challenges for child health in translational science? How can we help investigators who want to take them on? How can we help these investigators in developing studies that can be done across the consortia? And, from an extended perspective, how can we interact with other CTSA programs to develop best practices from which all can benefit?

"I think the CTSA program nationally is all about being sure that people are really prepared to do effective clinical and translational research, to do it an efficient way where we don't





WORKFORCE DEVELOPMENT: Develop a new generation of diverse, high-quality, child health-focused clinical and translational research (CTR) investigators through educational, training, and mentoring programs.



COLLABORATION + ENGAGEMENT: Create unique approaches and technologies to catalyze CTR, particularly in child health, through novel cross-disciplinary collaborations that engage multiple stakeholder communities.



METHODS + PROCESSES: Spark the development, evaluation, and dissemination of methods to enhance CTR, with an emphasis on the child-health CTR spectrum from conception to adulthood.



INTEGRATION: Foster multidisciplinary teams capable of conducting child-health CTR across the translational spectrum to address health disparities, fetal/maternal medicine, and rare genetic diseases.



INFORMATICS: Advance child-health CTR through a comprehensive, integrated information ecosystem, with user-friendly training in informatics methods and tools.

waste people’s time or resources, and where we really kind of get to the nut of the issue as quickly as possible,” Guay-Woodford says.

To maximize that efficiency, CTSI-CN will use the renewal grant to focus on informatics, workforce development, collaboration, and community engagement.

BY THE *NUMBERS*

Informatics, or the science of information, is right out in front in terms of the CTSA program’s focus. Informatics holds the power to advance care, but challenges remain in the collection and sharing of patient data, says Lawrence Deyton, M.D. ’85, M.S.P.H., senior associate dean for clinical public health and professor of medicine at SMHS, and co-director of the regulatory knowledge and science core for CTSI-CN.

“There are many disciplines crossing and in different kinds of research,” Deyton says. “It goes from basic lab research to genetics research to even public health research. But for all aspects, there are requirements in terms of ethics and transparency, and it’s important to do research in a way where patients and the community know what’s going on and that participants consent with full knowledge.”

A prime challenge is putting together an information system that allows the medical community access to informatics in a way that is effective and well-organized. “There’s a lot of data and you need to query those data efficiently and manipulate it efficiently so the information is in a safe and cyber secure environment — that’s the trick,” says Keith A. Crandall, Ph.D., director of GW’s Computational Biology Institute in the Milken Institute School of Public Health. “We have an exceptional team working on this. From bioinformatics platforms to tool developers to data analyzers to cybersecurity experts and

internet trafficking experts, we collaborated with the Division of Information Technology on this proposal because they know the ins and outs of data security and how to move data around from place to place efficiently and securely.”

FIELDING *YOUR TEAM*

Translational Workforce Development is another vital area, says Guay-Woodford. She compares it to choosing occupational therapists or psychotherapists to put on your research team. They can be a great asset, but it’s like asking a soccer player to make a game-day switch to baseball — the players are great athletes, but you need to show them how to play the game and give them the tools to succeed.

Just as there are different positions with unique roles and responsibilities on the athletic field, the CTSI-CN is customizing on-demand training to different groups to match their needs. One example is training for clinical research associates; they need to become savvy about regulatory, billing, and data management issues.

From Guay-Woodford’s perspective, if everybody on the team understands the game that is being played, what their role is, and what they need to do to work well together, you’ll end up with a winning team.

Amanda Kasper, M.P.H. ’09, director of operations for CTSI-CN, also likes how the award extends to a wide breadth of talent. “Educating and preparing the faculty reaches wide, to the nursing staff, clinical research staff, and beyond,” she says. “We want it to be across the workforce, using existing and new educational activities. A highlight is the number of internships being offered to scholars ... to spend time in prestigious organizations and get hands-on experience is very valuable.”

PLAYING TO YOUR STRENGTHS

The award also allows for the individual CTSA program to choose a pair of optional modules on which to focus. Orphan product acceleration, or the development of treatment options for rare diseases, is something about which many of the researchers involved with CTSI-CN are excited.

“We have a really strong history of drug development, particularly in the muscular dystrophy space and also pediatric device development,” Guay-Woodford says. The idea of this module was to provide an entry for an interested investigator to understand the steps needed to go down a path of drug development or device development, among them dealing with regulatory issues and business planning.

The other module, Child Health Research Acceleration through Multisite Planning, or CHAMP, focuses on how investigators from multiple institutions can work together on research and act on issues such as recruitment, ethics, and data collection. A team-building immersion boot camp to be held

annually at the University of California Irvine, focuses on the CHAMP themes, such as building a team through intrastream communication and how a team operates together.

Community involvement also remains an important feature of the CTSI-CN now that it’s shifted to the second version. A standout, Kasper says, is Science Café, a quarterly event held at Washington, D.C. staple Busboys and Poets, where community members participate in a discussion on medical topics. “It’s a chance to share research and help the community at large learn about a disease,” she says. “We’ve seen many people come to the event connected to the disease topic being featured in some way, [and] subjects have included sickle cell and asthma. The community engagement team works hard with the community to figure out their defined needs of what they want to learn about. Our advisory group of parents and community members are vital in giving us insight on possible programs for the community.”

Just as there are different positions with unique roles and responsibilities on the athletic field, the CTSI-CN is customizing on-demand training to different groups to match their needs.

LOOKING *DOWNSTREAM*

In a presentation to the SMHS Dean’s Council, Guay-Woodford says one strength of the CTSA is the opportunity to cross-train researchers and clinicians. “We will help investigators build their databases, recruit their patients, design their studies, prepare their IRB proposal, run their studies, and help them with community outreach,” she said during the talk.

It’s early, but Kasper sees the second round of this partnership flourishing since the award was given in July, and she is optimistic about what’s coming next. “Downstream, you see the effects of the clinical trials that are going through, and you see the infrastructure moving innovations that much more,” she says. “This is a great fusion of two institutions combining strengths.”

With empowering assistance to the medical community, Miller believes this second five-year cycle has a chance to lead to an incredible period of prosperity.

“So much of this builds through the community working together, but also among the CTSAs,” he says. “It makes us strong to have such a large number of people at the ready to share insights.” ■

CANCER ON THE MOVE

GW Cancer Center Moves into New Collaborative Space Atop the Science and Engineering Building

BY KATHERINE DVORAK

The days of basic scientists laboring in virtual isolation in their labs in search of the next discovery are well in the past. In today's research world, collaboration is key. That's never been more evident than in the sparkling new facilities on the eighth floor of George Washington University's (GW) newly built Science and Engineering Hall (SEH). The SEH reflects the importance of having a space dedicated to collaboration across disciplines.

The facility, which spans 500,000 square feet, is the largest academic building dedicated to the fields of science and engineering in Washington, D.C., and the very top floor is now home to a growing number of cancer research labs run by GW's School of Medicine and Health Sciences (SMHS).

Having the space allows SMHS to broaden its research efforts, especially when it comes to cancer and translational science, says Edward Seto, Ph.D., associate center director for basic sciences at the GW Cancer Center (GWCC) and professor of biochemistry and molecular medicine at SMHS.

Two areas of emphasis in the labs are cancer epigenetics and immunology and immunotherapy, says Seto, who provides leadership for the development, implementation, and evaluation of basic science-related programs and initiatives. He says scientists will also dedicate research to microbial oncology, work that will be done with the help of the Department of Microbiology, Immunology, and Tropical Medicine.

In addition, the space will better foster collaboration

between students and researchers in both SMHS and the School of Engineering and Applied Science, Seto says.

"A lot of non-scientists think research is [performed by] someone who's doing experiments alone in the basement or garage," he says. "But that's not how science is done. Scientists have to work together, where they can bounce ideas off each other and work in groups to do things beyond each [person's] expertise."

Every inch of the new floor, Seto goes on to say, "has been designed to promote collaboration and the exchange of ideas. With everyone working together, good ideas are bound to come out of it."

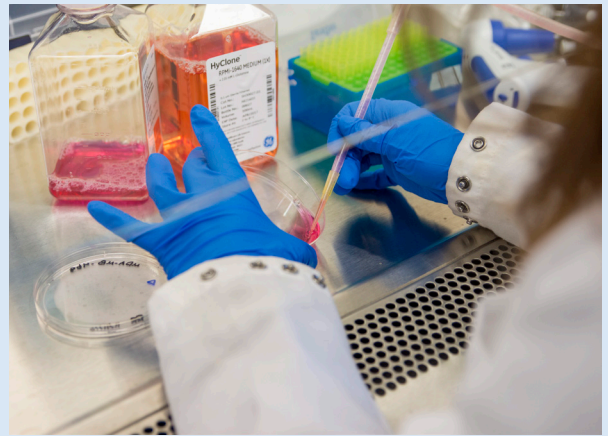
Currently, seven SMHS labs occupy the eighth floor. When the floor is completely filled, Seto expects to have between 12 and 15 labs in the space.

The floor also features 19 offices, 60 workstations, and common and meeting areas. It is outfitted with state-of-the-art equipment that will help researchers carry out their molecular biology, biochemistry, and cell biology work. In addition, the floor will house a new facility in which to perform patient-derived xenograft model studies, a preclinical platform that will help predict the effectiveness of novel chemotherapeutics for cancer patients.

Seto says the building and the eighth floor show GW's commitment to advancing both science and engineering, a strategic goal of the institution. ■



AT THE CORE



Within the 500,000 square feet of the new Science and Engineering Hall (SEH), researchers and students from the George Washington University (GW) School of Medicine and Health Sciences (SMHS) are hard at work not only on the eighth floor, but also in other areas of the building, including a specialized Nanofabrication and Imaging Center (NIC), operated by the Office of the Vice President for Research.

The NIC is one of the most pristine areas on campus. It houses a class 100 cleanroom equipped with a full spectrum of nanotechnology equipment that will be used to create devices that are tens of nanometers in size in an environment free from contaminants.

The neighboring microimaging suite is filled with modern microscopy instrumentation, allowing visualization of atomic structures, integrated microcircuits, neuronal circuits, and more. The advanced tools and technologies will allow researchers to study samples in ultra-fine detail and allow them to create large 3-D reconstructions of specimens.

For Anastas Popratiloff, M.D., Ph.D., adjunct associate professor of anatomy and regenerative biology at SMHS, combining all of GW's microscopy resources under one roof is a great approach.

"I believe in technology. I believe technology can change perceptions," he says. "This is the kind of thing that's going to move us forward."

The new labs and technologies allow for infrastructure that will expand the work and research GW does, he says. In addition, it encourages sharing of the equipment between students and faculty in the Columbian College of Arts and Sciences, the School of Engineering and Applied Science, and SMHS.

"I think collaboration now is becoming more and more important," Popratiloff says.







BELIEVE

grant

BY CAROLINE TRENT-GURBUZ

Brad Jones, Catherine Bollard, and Douglas Nixon were sitting around Bollard's office one morning, bouncing ideas back and forth. Other "collaboratories" — teams of researchers and institutions united under a National Institutes of Health (NIH) grant with a goal of curing HIV/AIDS — had devised clever, to-the-point names for their projects: CARE (Collaboratory of AIDS Researchers for Eradication), DARE (Delaney AIDS Research Enterprise), and the even more straightforward "defeatHIV." The trio wanted to do their mission justice.

“I guess maybe a week before that, I was having a conversation with a friend of mine who’s living with HIV, who has followed the research very closely,” recalls Brad Jones, Ph.D., assistant professor of microbiology, immunology, and tropical medicine at the GW School of Medicine and Health Sciences (SMHS). “He said, in a moment of weakness, that he wasn’t sure if he believed there would be a cure for HIV.”

The word stuck with Jones. Believe. He played around with possibilities and was surprised at how easily he could create a spell-out for the acronym reflecting the goals of the collaboratory: “Bench-to-Bed Enhanced Lymphocyte Infusions to Engineer Viral Eradication.”

“Our program goes all the way from basic science to the bench to the bedside: We’re taking these lymphocytes, which is another word for immune cells, so-called T-cells, and enhancing them, putting them back into the patient, and trying to eradicate infection,” he says. “It just clicked.”

Best Science

The BELIEVE grant, as it’s now known, is a multimillion-dollar grant awarded as part of the second iteration of the NIH Martin Delaney Collaboratory: Towards an HIV-1 Cure. Established in honor of late AIDS activist Martin Delaney, the five-year grant is designed to draw researchers out of their silos, pairing them with colleagues across the country. The grant also puts researchers together with private companies, in this case immunotherapeutic company Altor BioScience Corporation (Altor) as well as Torque Therapeutics (Torque), a biomedical engineering company, to accelerate the bench-to-bedside process.

“Part of the fun of this [grant] was finding partners that we think are doing really exciting, cutting-edge studies with products that we hope could also be of value in the HIV cure area,” explains principal investigator Nixon, M.D., Ph.D., chair of the Department of Microbiology, Immunology, and Tropical Medicine and Walter G. Ross Professor of Basic Science Research at SMHS. “It’s something important, for us to be working with industry partners.”

It’s just as exciting, he adds, to find other researchers doing the “best science,” a critical aspect of the inclusive, cooperative nature of the grant. “I think one of the things about this sort of team-type science is that no one group has all the expertise necessary, so you actually welcome the opportunity to reach out and find the best people.”

Driving the Research

To keep the research on track — and the communication flowing — the BELIEVE Executive Committee, composed of Nixon; Jones; Bollard, M.D., professor of pediatrics and of

microbiology, immunology, and tropical medicine at SMHS; and Alan Greenberg, M.D. ’82, M.P.H., director of the D.C. Center for AIDS Research, and professor and chair of the Department of Epidemiology and Biostatistics at the Milken Institute School of Public Health at GW, will track progress among the teams.

“The way we’ve structured this grant, all of the different objectives have milestones and timelines that they need to meet,” explains Jones. If all of those milestones are met, the grant value could reach \$28 million.

In essence, GW, in running the management and operations section, is the engine pulling the rest of the train. “Obviously,” Nixon adds, “you need all the parts to work together for a functioning unit. We have to keep all of our subcontracts in order, we have to keep the milestones on track, we have to have these compulsory meetings ... we’ve got a lot of administrative components that are really important.”

Armed Against Infection

With GW leading the way, the BELIEVE grant has several initial research foci: enhancing the killing capability of HIV-specific T-cells, expanding the functions of natural killer cells, helping the killer cells find HIV in the body more easily, and bringing the best combinations into clinical studies.

“The overall idea is that the different foci come together to turn the immune system into a kind of weapon against the HIV reservoir,” explains Jones.

Although antiretroviral therapy can help reduce HIV levels, it cannot reach dormant, or hidden, HIV in the latent cells, which can reactivate and start the infection cascade over again. Previous researchers have used “kick and kill” strategies to try to eliminate infected cells, but their efforts have been limited, owing to the inability of the immune system to reduce the viral reservoir, or kill enough of the infected cells. The BELIEVE teams will use their expertise — and the products of Altor and Torque — to define the mechanisms that have prevented the immune system from completely clearing the infected cells.

Enhancing the T-Cell

The investigations at GW and clinical partner Children’s National Health System, led by Jones and Nixon, focus specifically on the grant’s first research target: making the most of the T-cell’s killing power.

“My goal is to figure out how we can best aim killer T-cells against HIV-infected cells,” says Jones. “[HIV cells] have ways that they usually hide from the immune system, but we want to expose them. Other people have strategies they’re working on to send these T-cells to the right parts of the body and to directly enhance the function of the T-cells, but I’m really working on how to direct them properly.”

In other words, Jones is focusing more on the “kill” side of “kick and kill.” To accomplish his goal, Jones is working closely with Altor, which has developed a molecule known as ALT-803. This molecule reverses HIV latency in cells and, when given as a therapeutic, activates T-cells and natural killer cells throughout the body.

“What’s unique about Altor’s molecule is it actually wakes up hidden HIV and enhances the ability of the immune system to kill those reactivated cells, so we think it’s really unique and exciting,” explains Jones, adding that the company’s scientists also bring a great deal of enthusiasm and insight to the project. ALT-803 is currently in clinical trials for cancer, which makes establishing similar trials using the molecule for HIV/AIDS a faster, more efficient process.

Torque, on the other hand, has found a way to attach efficacy-enhancing drugs to cytotoxic T-cells via nanoparticle backpacks, a delivery method that can help the researchers precisely coordinate the “kick” with the “kill,” potentially leading to clearance of the HIV viral reservoir.

Jones is also focusing on a pair of preclinical systems. The first involves testing the cells of those living with HIV, in vitro. “We have assays that let us test different ways of eliminating HIV in the test tube,” he explains. “We need to pass certain milestones in that kind of controlled setting before we can expect to have success in the more complicated in vivo setting.” To connect the test-tube setting to patients, Jones and his team of investigators will use a unique mouse model as a stepping-stone to the clinical phase.

Historically, small animal models have proven a tricky prospect for HIV researchers because mice cannot be infected with HIV; rather, researchers create “humanized mice,” or mice carrying a human immune system. Jones is taking a different tack: “We’re taking those immune cells from people who have been on antiretroviral therapy for years, and [we’re] putting them into mice, so you already have that natural HIV reservoir.”

Bollard’s work, meanwhile, is more translational. Her research “involves the manufacture of HIV-killing T-cells and the administration of these novel T-cells to HIV-positive individuals on antiretroviral therapy given either alone or in combination with the latency reversal agent ALT-803,” she says. “We will evaluate the safety of this combination and the efficacy of this therapeutic approach to clear the viral reservoir.”

She will base the HIV-killing T-cells she’s developing on

the work Jones is conducting in the mice. Then, they’ll give those cells to patients.

“What’s unique about this grant is the rapid translation of novel ideas developed at the bench and then getting them to the clinic,” she says. “So much work is done that is focused on the mice or the monkey, and [it] never gets any further. It is refreshing to see such an emphasis on translation to the clinic.”

For Nixon, Bollard and Jones’ work exemplifies the greater goals of the grant. “We have an ambitious program in which we would like to be able to move into the clinic in Year Two,” he says. “We’ll have to see if that’s a possibility, but we’re certainly going to try and push for that. Our philosophy is best science plus getting into the clinic as rapidly as possible.”

Broader Conversations

Outside the labs, the grant will prioritize community engagement through local advisory boards and ongoing communication.

“[It’s not] just teaching the community, [it’s] listening to people’s expectations about cure research, their fears, their hopes, so that we can be sure that we’re responsive to the people that we’re trying to help,” explains Jones.

Washington, D.C., in particular, has had some of the highest rates of HIV in the nation, according to Greenberg, and the grant helps establish the nation’s capital as “one of the focal points for NIH-supported HIV cure research,” he says, which is vital for the community.

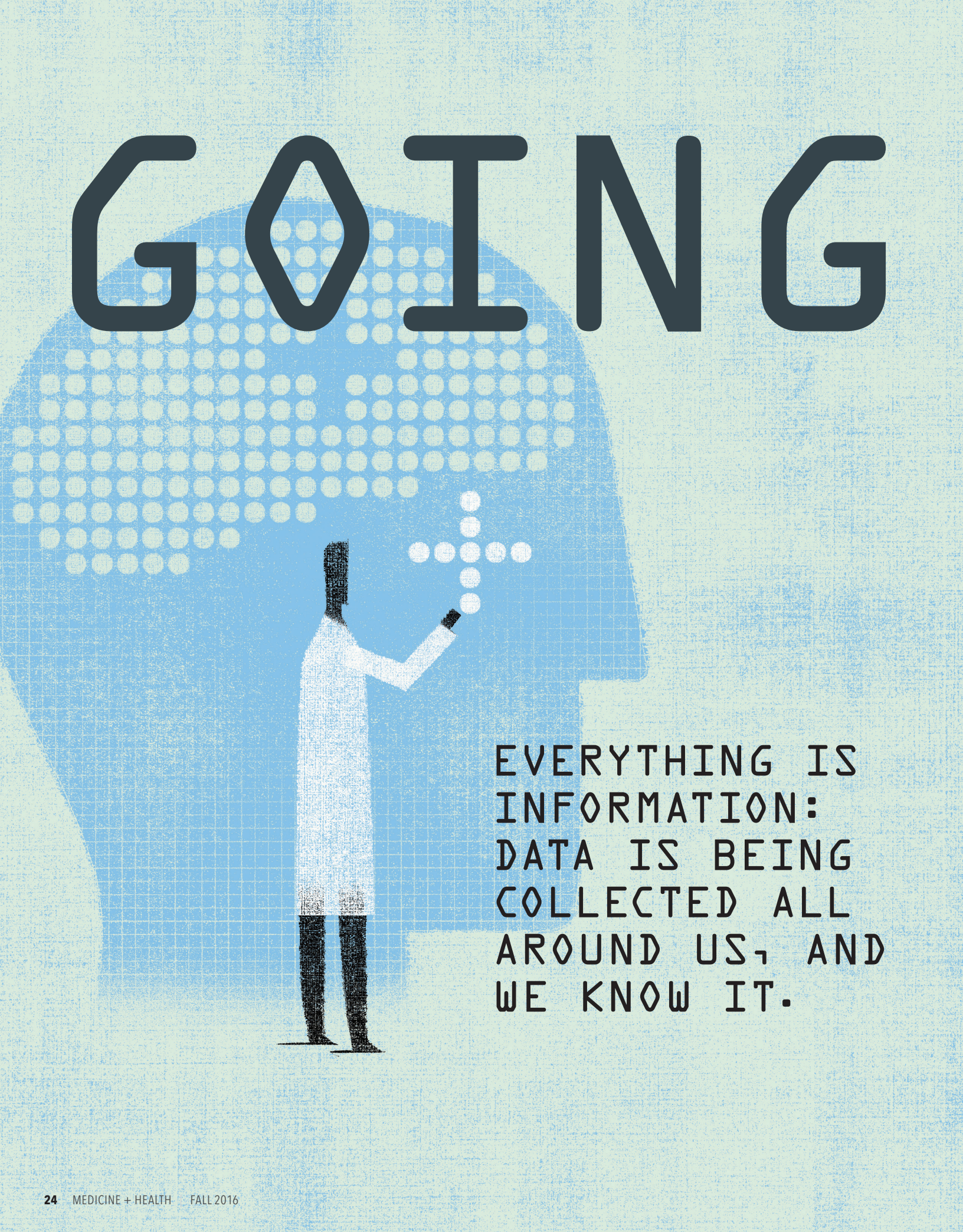
Working with the community will also help the team address misconceptions about what a cure could look like; taking a pill or two, Jones says, is not yet on the horizon. What is available now, however, are the highly customizable procedures that the BELIEVE grant is pursuing. “There are a lot of approaches, like ours, that involve donating cells that are manipulated and then reinfused into individuals,” he says. “We want to be responsive to the community to make sure that in their perspective, the cures that we develop are a significant improvement over the current option, which is daily antiretroviral therapy. We want to make sure that we’re engaging in a dialogue at all steps of the process.”

With that conversation in mind, Jones adds that his friend, representative of the community, isn’t quite a believer — yet. “He does [know about the grant and the work we’re doing],” says Jones. “He’s quite touched that his comment became part of this large effort.” ■



“We want to be responsive to the community to make sure that in their perspective, the cures that we develop are a significant improvement over the current option, which is daily antiretroviral therapy.”

GOING



EVERYTHING IS
INFORMATION:
DATA IS BEING
COLLECTED ALL
AROUND US, AND
WE KNOW IT.

BIG

BY ERIC BUTTERMAN

It's happening at the checkout line when we get that discount for using our grocery store rewards card — and the store is learning our preferences in return.

Health care services may not be marketed to us the way products in the grocery store are, but a mountain made up of medical records has appeared in the virtual world, and it's growing exponentially every year. At the core of that mountain runs a rich vein waiting to be unearthed — medical data — and that digital ore offers all of us the chance for a healthier future.

Important big data contributors at GW School of Medicine and Health Sciences (SMHS) are looking to mine that data and refine it into a most precious resource: innovation.

DEFINE BIG

Big data is a techno-term that frequently gets tossed around. But what is big data exactly? How big is big? With the expansion of technology into our daily lives, whether it's our smartphones; the radio-frequency ID tags that track our packages, our pets, and more; genomic data; or our electronic medical records, information is piling up at a dizzying pace. According to computing giant IBM, we've reached the point at

which society is generating between two and three exabytes of information daily. To put that into perspective, your top-of-the-line laptop might boast 500 gigabytes, or half a terabyte, of hard drive space; an exabyte is 1 million terabytes.

For Raja Mazumder, Ph.D., associate professor of biochemistry and molecular medicine at SMHS, what *big* means is *beautiful*. "Most of the time with big data, there are certain technologies such as next-generation sequencing, which produces a lot of data. But how much data? I heard in a talk that conceptually it costs millions of dollars to put a satellite into orbit producing x amount of data, but it doesn't cost millions of dollars to purchase a sequencing machine to generate an equivalent amount of genomic data."

And, when it comes to the medical field, where the data is coming from isn't the question. It's really where *isn't* it coming from.

"It's practically all over," Mazumder says. "Some of it still is coming the old-fashioned way — a health practitioner inputs medical information — but quite a bit is being generated by medical instruments working directly with software generating a vast amount of genomic data, for example."

GETTING "INFORMED"

At the core of big data in medicine are two vital disciplines, bioinformatics and medical informatics. Let's start with bioinformatics.

"Bioinformatics, in our area at the school, is dry lab technology, which means we analyze biomedical and biology-related data and use algorithms to analyze it and come up with methods to process, store, and compute it," explains Mazumder. "And we share the data and define security [protocols] to even work with it."

Mazumder co-directs the HIVE project, which stands for High-performance Integrated Virtual Environment, a collaboration between his group and the U.S. Food and Drug Administration. The project is a dynamic cloud system for bioinformatics sequence data analysis focused on harnessing next-generation data sequencing; more recently, his group has also been working on proteomic data analysis.

In fact, multiple bioinformatics projects at GW focus on trying to standardize computations. "Standardized means, for example, you have a vaccine sample and you are producing that vaccine in your company all the time," Mazumder says. "But how do you know from Batch 1 to Batch 2 that you still have just the vaccine and that contamination hasn't occurred? Once you analyze [gene-sequence data], then you can say in a particular sample that you have the all-important pure culture of vaccine and no mutations that are detrimental."

The biggest challenge for next-generation sequencing data analysis is the ability to scale up. This issue can come into play if, for instance, a patient has the hepatitis C virus and you want to know the genotype of that virus, Mazumder explains. Determining the genotype can be difficult because in the case of hepatitis C, the illness is chronic; it can create subclones of viruses in a patient, and the

same patient can be infected more than once in a lifetime. “Sequencing the virus from one patient one time isn’t tough, but when you get 50 to 100 samples, the computers and the algorithms available are not sufficient and, therefore, they require scaling up,” he says.

In other words, as researchers move to the high-throughput sequencing machines, the amount of data produced can be huge.

“With the bioinformatics we’re specifically working on — if, say, a patient has a mutation in position 53 in a specific protein, so what?” Mazumder says. “But the hope is that if we can have additional pieces of information through

complementary discipline.

“There are many definitions, but the gist of medical informatics is that it’s about using information technology to improve medical research, medical care, and health care delivery; basically applying data science, information science, and technology to improve health care,” says Zeng. “We use information science and computer science methods to improve aspects of the biomedical research or biomedical science, even clinical research.”

The amount of data to choose from is practically equivalent to the raindrops in an endless monsoon.

“You have to be amazed at all the

that you just don’t see in a clinical trial ... When looking at medical records, you can go back 15, possibly even 30 years.”

The numbers say medical informatics’ reach looks to be expanding. According to the 2014–24 projections on the Bureau of Labor Statistics website, medical records and health information technicians will see 15 percent growth in employment. “We’re just at the start of what can be done,” Zeng says.

In the end, how do medical informatics and bioinformatics best complement each other? “I think what will happen is hospitals will start having their own databases of genomic sequence data,” Mazumder says. “Then, the

“WE’RE JUST AT THE
START OF WHAT CAN
BE DONE,” ZENG SAYS.

comprehensive data integration for the hepatitis C virus, then we can say that this position codes for this protein and there is already a drug that targets that mutation. And if you have that, now you have actionable information from a research perspective. And then ... you can look at a treatment perspective.”

COMPLEMENTARY COMPUTING

Yet there’s still that other major player to consider in big data: medical informatics. Some may view it as a rival to bioinformatics, competing interests in a battle for health information. Medical informatics, to Qing Zeng, Ph.D., professor of clinical research and leadership at SMHS, isn’t a competitor to bioinformatics but rather a potential

data available for medical informatics,” Zeng says. “It’s the collection for routine clinical trial patients, it’s the medical record, and even a biosample collected.”

One form that medical informatics has taken at SMHS is the Otsuka Data Mining project. “Otsuka is a company in the pharmaceutical space,” she explains. “They were interested in psychiatric disease and wanted us to look at aspects such as schizophrenia and bipolar disease [to predict outcomes].”

The team identified more than 1 million patients who fit the criteria they were focusing on. “Remember that clinical data tends to be more diverse than clinical trial data because [patients in the latter group] tend to be younger and healthier,” Zeng says. “We do a retrospective analysis on data sets and can pick a large amount of information

medical informatics data will not only use electronic health records, it will use genomic health data that is continuous.”

RESPECT THE PATIENT

Still, when you combine a seemingly nonstop pipeline of statistics and something as personal as health information, there is risk. “I think we will see some changes in years to come in how patients have access to data, that they have access and can do what they want with data,” Mazumder says. “My perspective is I think the data should belong to the patient. We need to make strides, but we have to remember, at the least, the dignity of the patient and a sensitivity to what these statistics mean to them.” ■

FROM ITALY TO AMERICA

BY CAROLINE TRENT-GURBUZ

Carolina Panico, M.D., Ph.D., laughs as she describes telling her father she had become an American citizen. “I called my dad, I told him, ‘Dad, I’m an American today!’ and he said, ‘You were American before.’”

Panico, a native of Naples, Italy, originally came to the United States during her Ph.D. program, when she was a student at the Second University of Naples. “I had the chance to come to the States to visit Georgetown University,” she says. “After my visit, the director of the laboratory in the Department of Nephrology there became my co-mentor for my Ph.D. thesis.”

Panico conducted most of her research in renal and cardiovascular pathophysiology at Georgetown University, where she stayed until moving across town to work in the Department of Biochemistry and Molecular Medicine at the GW School of Medicine and Health Sciences (SMHS). It was there that she started exploring regulatory affairs.

“I heard about the regulatory affairs [program at GW] because this has become one of the hot topics in the last few years,” she says. “It sounded very exciting to me, and I applied, and I was accepted.”

The program was a good fit: “It integrates elements of global regulatory strategy across the entire curriculum, and you get an understanding of the regulation for the development of [a] spectrum of products, like drugs, devices, biologics,” she explains. “Also, you acquire the ability to work in an international environment, which is very important to me.”

The program also offered Panico insight, she says, into areas somewhat neglected during traditional education: entrepreneurial thinking and the rules and regulations of medicine development. The latter allowed her to gain greater understanding of the bench-to-bedside process, while the former is opening up new potential career options — possibly sooner rather than later.

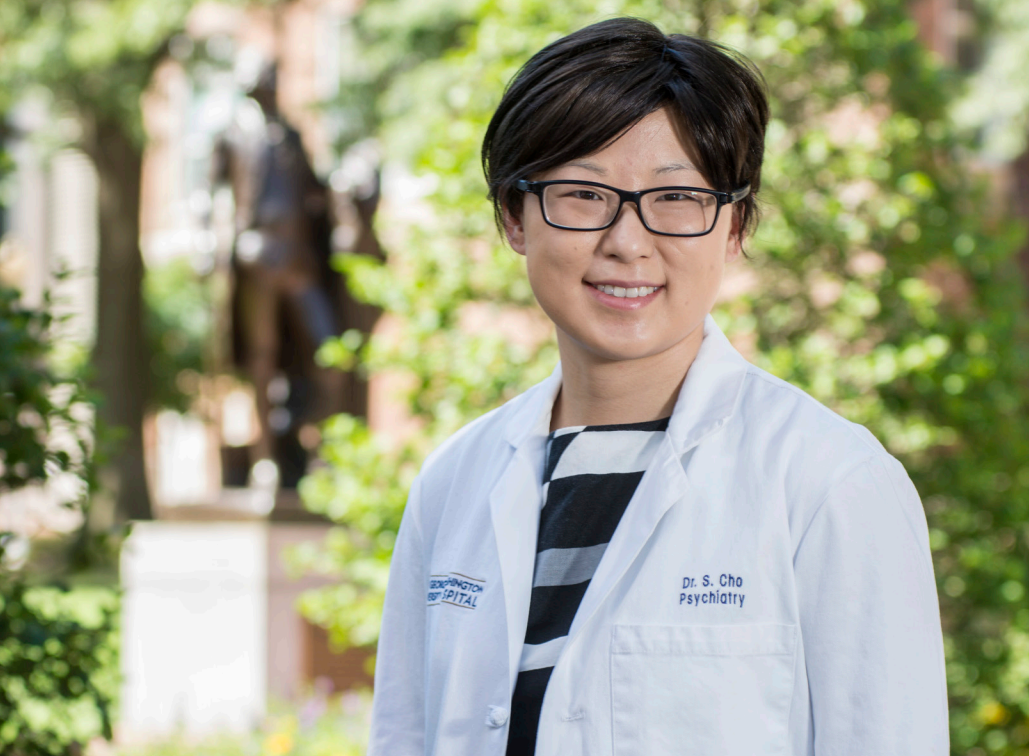
“I have some very good news,” Panico announces. “There is a fellowship I applied to, the Federal Drug Administration Commissioner’s Fellowship, which is in regulatory science, and I actually was selected.”

Panico attributes her selection for the fellowship directly to her experience in the SMHS Regulatory Affairs program; she was able to meet with several experts through GW, and her most recent classes, she says, helped her perform well during the interview.

The fellowship will keep her in the Washington, D.C. area, and although she continues to miss her family and best friends in Italy, she has found one bright spot in the city that has become her home: a Neapolitan pizza place in her neighborhood.

“There are great places now where you can eat very good Neapolitan pizza; there’s one in Takoma Park especially,” she says. “I’m a little picky about my pizza.” ■





life and the quality of life they have. That's what I've begun focusing more and more on throughout residency."

That kind of focus — how someone's health, mental or physical, affects quality of life — goes back to her early days at MIT, when she was rushing a sorority. "One thing that I realized when I went through the recruitment process was it's a really a stressful situation; you're being put into a social situation where you're not judging each other, but you're trying [to find] a really great fit," she says. "Especially in the beginning of college, in that age of adolescence, it becomes very much about, 'Am I good enough? Do they like me?'"

Cho, who joined Alpha Chi Omega, became a recruitment counselor and

The One Who Understands

BY CAROLINE TRENT-GURBUZ

Stephanie Cho's office, at the end of a long, U-shaped corridor, is calm and soothing. She speaks enthusiastically about her profession — she's a PGY IV chief resident in psychiatry at the GW School of Medicine and Health Sciences (SMHS) — and her goal is clear: to treat those in need.

"I knew from a young age that I wanted to be a doctor," Cho recalls, settling into a chair near her desk. The daughter of Korean immigrants, she grew up in the suburbs of Los Angeles. When she was younger, her father suffered from heart problems, an experience that "sparked [her] interest in medicine."

In pursuit of the "best science education" she could get, Cho moved from coast to coast: first, to the Massachusetts Institute of Technology (MIT) and then, following graduation, back to southern California, where she earned her M.S. and M.D. degrees from Loma Linda University. Now, she's nearing the end of her psychiatry residency at SMHS, and her next step is a fellowship in psychosomatic medicine.

"Psychosomatic medicine ... is basically psychiatry [for] the medically ill," she explains. More specifically, the discipline connects psychological and behavioral factors with their impact on health and disease. "That brings it all together for me," says Cho. "As I went through medical school and residency, I realized that this is what I always pictured as being a doctor: being aware of a patient's medical problems and how they are affecting their

reached out to MIT mental health. Together, they brought in psychiatrists and therapists to train counselors on how to help students process what could be an emotionally grueling experience.

A few years later, as part of a clerkship, Cho helped another group of students deal with a potentially draining undertaking: treating addiction patients with empathy. "This was very interesting to me in general, because it's not just psychiatrists who deal with it; really, all physicians need to address addiction in their patients," she explains. What she found was that medical students tended to be more empathetic to certain subsets of patients, such as veterans. With patients who grew up in more privileged environments, medical students were actually less empathetic. Cho is now working on a project to help address how students feel or don't feel empathy toward patients with psychosomatic illnesses.

"I feel very strongly that all doctors should have [empathy] cultivated in them and really developed in them as they go through medical school — and be allowed to identify and be honest about it when they don't feel empathy," she says. "[It's about] really being able to allow us as physicians to identify and maintain a strong sense of empathy without letting it drown us at the same time."

Cho plans to continue shaping empathy in all medical students, particularly when it comes to psychiatry. "I want to become a clerkship director and teach psychiatry to medical students," she says.

As she explains, she doesn't want to "preach to the choir"; she wants to make sure every student, regardless of future specialty, feels comfortable addressing patients' psychiatric needs. "Being able to give students that tool kit, to recognize their own levels of empathy and be able to address that to help people, that is what I want to do," she says. ■

THE POWER AND PROMISE OF MEDICINE

BY CAROLINE TRENT-GURBUZ

Marcus Mitchell, clad in green scrubs and his GW School of Medicine and Health Sciences white coat, has only a short break after finishing his rounds at GW Hospital to talk about the meandering path he's taken in medicine.

The D.C. native and fourth-year M.D. student initially planned on pursuing emergency medicine, but “although I have so much respect for the field, I quickly found out that it wasn't for me,” he says, laughing. “Had you told me I'd be applying to anesthesiology last year, I probably wouldn't have believed you. It's something that just kind of developed.”

Anesthesiology, he explains, pausing to sip from his to-go coffee, is procedural and hands-on, with moments of intensity. It incorporates pharmacology and physiology, which appeals to him, and it allows him to interact more closely with his patients, giving them his undivided attention. “I like that even though [during] your interaction with your patients, their conscious awareness is brief, it's really powerful, especially during the pre-op encounter.”

That kind of interaction is central to Mitchell's brand of medicine: He cares about his patients, about his community, and about his future clinician colleagues. “I want to be involved with and serve an underserved community; that's really important to me, that I have diverse patients who come from all over and have various socioeconomic statuses,” he explains. Already a veteran of medical mission trips to Haiti and Ecuador, Mitchell plans to bring his anesthesia skills to wherever they're needed most.

And at home, he plans to give back. When Mitchell first entered SMHS, he was awarded the Power and Promise scholarship, designed to alleviate the financial burdens for GW's best and brightest. It's helped relieve his student debt — and inspired him. “It actually encourages me to give back as an alumnus,” he says. “I definitely want to have my own scholarship fund so I can give back and help some [unsuspecting] student who's doing a good job.”

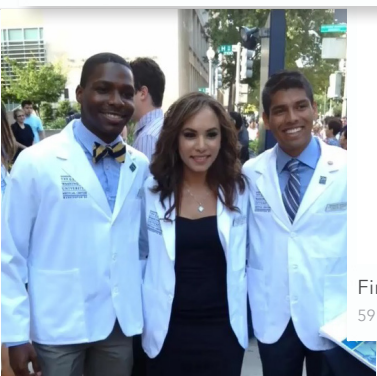
With that, Mitchell stands up, coffee cup still in hand, to head back to the hospital, where he'll remain on call until 9 a.m. the next day. ■



The fam. #gwmed #blackmeninmedicine 75 WEEKS AGO



First operation of MS3 was a success! 59 WEEKS AGO



I can truly say that I had some great times this year #gwmed 121 WEEKS AGO

Fourth-year M.D. student Marcus Mitchell is an avid Instagram user.

FACULTY NEWS



The Heart-Brain Connection

Between the heart and brain lie a series of connections – sometimes figurative, in this case literal – that researchers believe are the key to helping the millions of patients who suffer from heart failure. David Mendelowitz, Ph.D., vice chair and professor in the Department of Pharmacology and Physiology at the GW School of Medicine and Health Sciences, and Matthew Kay, D.Sc., associate professor in the Department of Biomedical Engineering at the GW School of Engineering and Applied Science, will examine that connection, thanks to a four-year, \$1.6 million grant from the National Heart, Lung, and Blood Institute.

The two will study ways to restore parasympathetic activity – which is cardiac protective – to the heart through oxytocin neuron activation, which could improve cardiac function during heart failure. Heart failure affects both neurologic and cardiac function; Mendelowitz will focus on the neuroscience behind heart failure, whereas Kay will use high-speed optical assessments of heart function to identify how oxytocin nerve activation benefits the heart. ■



Take a Breather

Asthma in children living in the inner city can be especially severe, and research by Stephen Teach, M.D., M.P.H., chair of the Department of Pediatrics at Children's National Health System and professor of pediatrics and emergency medicine at the GW School of Medicine and Health Sciences, shows there are distinct subgroups of asthma patients within that vulnerable population.

Funded by the National Institutes of Health, the Inner-City Asthma Consortium (ICAC), of which Teach is a member, consists of a group of investigators from across the country that focuses on improving outcomes for inner-city kids with asthma. After a year of observing more than 600 such children, Teach and his ICAC colleagues were able to identify five distinct asthma phenotypes.

The phenotypes found were lower allergy/inflammation with minimal asthma symptoms, which affected 15 percent of participants;

highly symptomatic asthma (even with treatment) and lower allergy and inflammation, which affected 15 percent; minimal asthma and hay fever symptoms, with intermediate allergy and inflammation, which affected 24 percent; higher asthma and hay fever symptoms and allergy inflammation, which affected 30 percent; and the most symptomatic asthma with the highest serum IgE, blood eosinophil count, and allergen sensitizations, which affected 16 percent.

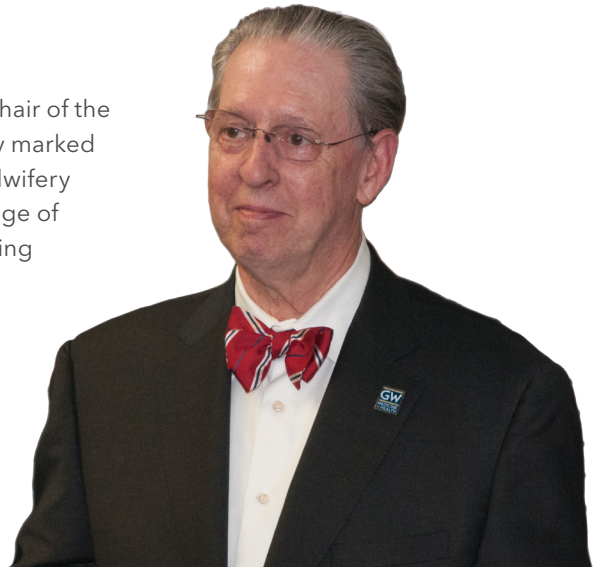
"For the first time, we've been able to describe in very elegant, very complete fashion various subgroups within this population, and going forward, these subgroups are likely to guide studies of targeted therapy," Teach said.

The findings were published recently in the *Journal of Allergy and Clinical Immunology*, along with two other studies by ICAC researchers on inner-city pediatric asthma. ■

Excellence in Care

John Larsen, M.D., professor of obstetrics and gynecology and former chair of the department at the GW School of Medicine and Health Sciences, recently marked his decades-long career with a prestigious award: the 2016 Hellman Midwifery Partnership Award. Larsen, who has been a fellow of the American College of Gynecology (ACOG) since 1976, received the ACOG recognition for having demonstrated outstanding support for midwifery through advocacy for women; excellence in clinical, education, and research endeavors; and leadership in collaborative practice. Larsen has played a leading role in integrating midwifery care into GW Hospital, and he helped expand access to evidence-based comprehensive care.

The award is jointly sponsored by the American College of Nurse Midwives (A.C.N.M.), the A.C.N.M. Foundation, Inc., and the Midwifery Business Network. ■



Health Equity and Cultural Sensitivity

With a pair of grants totaling more than \$1 million, the George Washington University Cancer Center (GWCC) continues to advance health equity across the Washington, D.C. area. From the Pfizer Foundation, GWCC received \$1 million to promote patient-centered cancer care and increase patient health literacy and cultural sensitivity. The project, which provides resources for patients and health care providers to have improved conversations, will examine how gender, gender identity, race, ethnicity, sexual orientation, and income affect the patient-provider

relationship.

The second grant, \$100,000 from Susan G. Komen, given as part of a local investment of more than \$1 million, will fund a multifaceted project designed to reduce cancer disparities in the lesbian, bisexual, and transgender (LBT) community in Washington, D.C. The goal of the project is to increase LBT individuals' health literacy and engagement in health care and help health professionals provide more sensitive care to LBT patients at risk of or diagnosed with breast cancer. ■

Section Selection

Pedro A. Jose, M.D., Ph.D., professor of medicine and of pharmacology and physiology at the GW School of Medicine and Health Sciences, was elected to serve as chair of the Hypertension and Microcirculation Study Section at the National Institutes of Health (NIH).

The study section reviews grant applications involving basic and applied aspects of cardiovascular regulation with a focus on microcirculation, the pathogenesis of hypertension, and the physiology of blood pressure regulation. Jose, in his role, will facilitate the review process, which includes summarizing the grant reviewers' discussion and calling for a final vote to determine the reviewers' opinion regarding the scientific impact of the grant proposal. Once the grant proposals are reviewed, the appropriate council conducts a second round of reviews, and a recommendation is sent to the NIH for a final decision.

Jose previously served as chair of the Hypertension and Microcirculation Study Section from 1996 to 1998, when it was known as the Cardiovascular and Renal Study Section B. The scope of the study section has since narrowed. ■

FACULTY NEWS



Teaching and Tuberculosis

Ian Toma, M.D., Ph.D. '11, M.S.H.S. '04, associate research professor of clinical research and leadership, and of medicine at the GW School of Medicine and Health Sciences (SMHS), was selected as a Core Fulbright U.S. Scholar to facilitate

bioinformatics and genomics education and to conduct a research project in Moldova.

Genomics and bioinformatics are at the forefront of molecular medicine and public health fields. Toma will collaborate with the State University of Medicine and Pharmacy of Moldova (SUMPH) to develop an educational program in bioinformatics and genomics for medical students, residents, and local scientists. By developing this program, Toma will not only help raise the capacity of SUMPH in this

area, but also foster the collaboration of students, faculty, and scientists with SMHS and other international partners.

Toma will also initiate a joint SUMPH/SMHS research collaboration between faculty and scientists on genomic aspects of tuberculosis (TB) and its multidrug resistant (MDR-TB) forms. The project, titled "MDR-TB Results from Unmasking of Resistant Strains from the Total Mycobacteria Population by Antibiotics," will look at the genomic profiles of patients diagnosed with TB and strains isolated from patients in Moldova. The goal of this research is to create an accurate and simple genomic test to determine how the patients respond to treatment and whether patients are at risk of developing the MDR-TB forms, which are often missed and hard to diagnose. ■

making
HISTORY

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Thymectomies and Myasthenia Gravis

Henry Kaminski, M.D., chair of the Department of Neurology and Meta Amalia Neumann Professor of Neurology at GW School of Medicine and Health Sciences, has found that removing the thymus effectively reduced myasthenia gravis (MG) patients' muscle weakness, as well as the need for immunosuppressive drugs and hospitalizations.

"While surgery is expensive and not without risk, this research will

empower patients and their doctors to make informed decisions regarding treatment," said Kaminski.

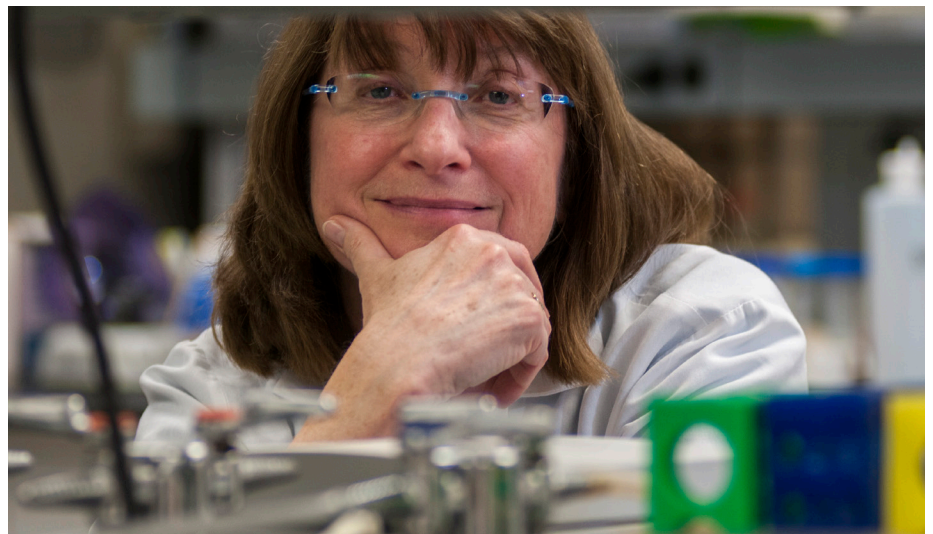
Previous studies have suggested that removing the thymus may reduce MG symptoms – droopy eyelids; blurred or doubled vision; difficulty talking, breathing, and swallowing; and neck and limb movement problems – but Kaminski's study, published in the *New England Journal of Medicine*, is the first randomized study of thymectomy in MG patients, providing clinical evidence of the benefits of the surgery. ■

A Culture of Collaboration

Gaetano Lotrecchiano, Ed.D., Ph.D., assistant professor of clinical research and leadership and of pediatrics at the GW School of Medicine and Health Sciences (SMHS), is spearheading a new seminar, "Creating a Culture of Collaboration at George Washington University," or C³@GW. The seminar brings together a cross-disciplinary community of GW expert faculty with an interest in scientific collaboration and connects them to regional and national partners and experts.

Elements of C³@GW include "think tanks," or communities representing GW, local institutes, and federal government stakeholders, as well as short- and long-term discussions emphasizing the mechanisms of scientific collaboration: developing and educating team scientists; measuring team effectiveness; technologies for collaboration and scholarship informatics; organizational supports; faculty reward and recognition for collaborative activities; and issues crossing cultural, ethnic, and gender boundaries in science.

C³@GW is a collaborative venture with the Clinical and Translational Science Institute at Children's National Health System, the SMHS Department of Clinical Research and Leadership, and additional experts from the GW community, other universities, and government agencies. ■



Leading the Charge

Sally A. Moody, Ph.D., professor and interim chair of the Department of Anatomy and Regenerative Biology at the GW School of Medicine and Health Sciences, is on the rise: She was recently elected to a two-year term as vice president, and later president, of the Society for Craniofacial Genetics and Developmental Biology (SCGDB).

Moody, who has held leadership positions both internally at GW and externally, including serving as program official in developmental genetics and genomics at the National Institutes of Health - Eunice Kennedy Shriver National Institute of Child Health and Human Development, will bring

invaluable experience to SCGDB. The international organization, established in 1975, is committed to advancing the knowledge, health, and prevention of craniofacial disorders through education and research. The goal of the organization is to decrease the incidence of birth defects affecting the craniofacial region.

Moody was also part of a team of researchers whose study, "Label-free Quantification of Proteins in Single Embryonic Cells with Neural Fate in the Cleavage-Stage Frog (*Xenopus laevis*) Embryo Using Capillary Electrophoresis Electrospray Ionization High-Resolution Mass Spectrometry (CE-ESI-HRMS)," was featured on the cover of *Molecular and Cellular Proteomics*. ■



Salute to Sarani

Babak Sarani, M.D. '97, associate professor of surgery at the GW School of Medicine and Health Sciences, has completed a neat hat trick: three awards in three years. In 2014, Sarani was the faculty inductee for the Gold Humanism Honor Society, which recognizes those who have demonstrated excellence in clinical care, leadership, compassion, and dedication to service. The next year, Sarani, chosen by third-year medical students, earned the Golden Apple Award for Teaching Excellence. This year, he was selected by the members of the Emergency Medicine Residency Class of 2016 as the recipient of the Residents' Choice Award, Off-Service Attending of the Year, for trauma surgery. ■



Taking Aim at New Targets for Myasthenia Gravis Treatment

Linda Kusner, Ph.D., associate research professor in the Department of Pharmacology and Physiology at GW's School of Medicine and Health Sciences, received a multi-year Muscular Dystrophy Association research grant of nearly \$300,000 to provide a new fundamental understanding of the basic mechanisms of autoimmunity and to

validate a new therapeutic target for myasthenia gravis (MG).

Kusner aims to develop a therapy for MG that might lessen or eliminate the need for corticosteroids, the current standard of care. With colleagues, she discovered a protein called survivin present in MG-affected cells that the group believes supports the presence of autoreactive immune cells by allowing them to escape cell death. In studies that targeted the protein, Kusner and her team observed a reduction in the levels of antibodies in the MG disease process.

In her new work, Kusner will analyze thymus tissue from MG patients as well as from healthy individuals to determine whether the survivin protein is present in both. Kusner's team also will evaluate survivin-based therapeutics in an MG rodent model to assess the therapeutics' ability to improve observable weakness, decrease the expression of autoreactive immune cells, decrease acetylcholine receptor-specific antibodies, and decrease damage to the nerve-muscle junction. ■

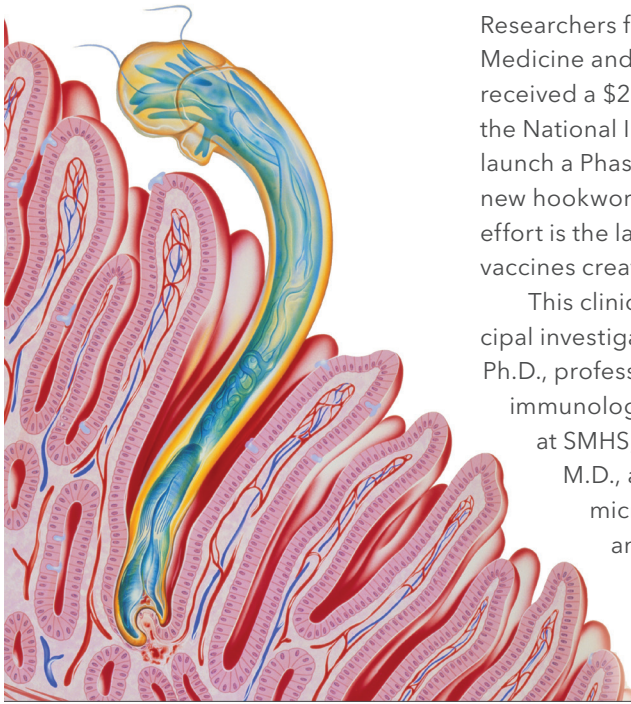
Getting On Board

Eduardo M. Sotomayor, M.D., inaugural director of the George Washington University Cancer Center, was elected to serve on the board of directors of the Association of American Cancer Institutes (AACI). Sotomayor began his three-year term in October 2016.

The AACI comprises 95 leading cancer research centers in North America – including National Cancer Institute (NCI)-designated cancer centers and academic cancer research programs that receive NCI support.

Sotomayor was elected to this prestigious group along with Karen Knudsen, Ph.D., B.S. '91, who is the third director of the Sidney Kimmel Cancer Center at Thomas Jefferson University in Philadelphia, an NCI-designated cancer center since 1995. ■

Support for Hookworm Vaccine Trials



Researchers from the GW School of Medicine and Health Sciences (SMHS) received a \$2.1 million U01 grant from the National Institutes of Health to launch a Phase 1 clinical trial to test a new hookworm vaccine in Brazil. This effort is the latest in a series of tropical vaccines created by SMHS researchers.

This clinical trial – led by co-principal investigators Jeffrey Bethony, Ph.D., professor of microbiology, immunology, and tropical medicine at SMHS, and David Diemert, M.D., associate professor of microbiology, immunology, and tropical medicine at SMHS – will be the first time immune interference has been tested using

new antibody profiling methods and B-cell immunology.

“We have two separate vaccines for hookworm that have each been tested on their own,” said Diemert. “We would like to combine them into a single product, so we have one vial offering the greatest protection against hookworm.”

A parallel clinical trial, funded by the European Commission, is underway in Africa; in this trial, all volunteers have been given both vaccines. In Brazil, some volunteers are given one of the vaccines, and others are given both vaccines, creating greater opportunities for comparison. For the clinical trial, GW is partnering with the Fundação Oswaldo Cruz in Brazil, University of California–San Francisco, and Johns Hopkins University, as well as the Sabin Vaccine Institute. ■

T-Cell Exhaustion and Toxoplasmosis

New research critical to treatment for chronic toxoplasmosis, one of the most common parasitic diseases worldwide, was published in the *Journal of Experimental Medicine*. A team of researchers from the GW School of Medicine and Health Sciences, led by Imtiaz Khan, Ph.D., professor of microbiology, immunology, and tropical medicine, identified a connection between CD8 T-cell exhaustion and CD4 T-cell exhaustion. They also determined that CD4 T-cells can be regulated by Blimp-1 protein expression. The discoveries could lead to new treatment possibilities.

Toxoplasmosis is a parasitic infection that in healthy adults does not typically cause symptoms. Among pregnant women and the immunosuppressed, however, the consequences can be severe. This disease is especially



prevalent in HIV/AIDS populations.

The study, titled “Blimp-1 Mediated CD4 T-Cell Exhaustion Causes CD8 T-Cell Dysfunction During Chronic Toxoplasmosis,” is funded by

a grant from the National Institutes of Health.

Khan recently received the SMHS Distinguished Researcher Award for his work on toxoplasmosis. ■

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Finding Promise in Cancer Research

BY CAROLINE TRENT-GURBUZ

When Milwaukee, Wisconsin, native Heather Levin, M.D. '15, starts talking about research, her enthusiasm and delight builds, and it's clear how much the work means to her.

"It's really exciting for me to have this research year," she explains.

Levin, with help from primary investigator Lopa Mishra, M.D., director of the Center for Translational Medicine and professor of surgery with the GW School of Medicine and Health Sciences, applied for the newly established Albert L. Tucker and Elizabeth T. Tucker Postdoctoral Fellowship earlier this year. The \$1 million grant, available through the Albert L. Tucker and Elizabeth T. Tucker Foundation, supports the postdoctoral training program for promising young cancer researchers. This year, that researcher was Levin.

"Having this award allows me to pursue a research year before I begin residency, which will allow me to strengthen my medical background and strengthen my science background before I start," she explains.

The fellowship is housed within the George Washington University Cancer Center, led by Eduardo M. Sotomayor, M.D.

"We are very grateful for the support that has been

provided by the Tucker Foundation," he says. "It will enable us to provide valuable training to a fellow who will make a difference in the field of cancer research."

Levin, working in Mishra's lab, is exploring liver cancer, one of the most common causes of cancer deaths worldwide. As she explains, there are two strands to her team's research, "Targeting E3 Ligases in Liver and GI Cancer." First, they identified the TGF-beta pathway, a cellular pathway that plays a variety of roles in liver cancer, including one as a tumor suppressant. Second, using the cancer genome atlas, a "huge catalog of genome sequencing and genetic mutations from cancer patients," Levin explains, they found that a specific enzyme — E3 ligase — was altered in more than 50 percent of patients with liver cancer included in the atlas.

"Looking at that specific enzyme, it actually targets part of the TGF-beta pathway for degradation," Levin says. "The TGF-beta pathway is playing a tumor suppressive role, and the E3 ligases are degrading a piece of that pathway [and] stopping that tumor suppressive role, so we believe that we can target those E3 ligase enzymes with various treatments. We can actually restore that tumor suppression role of that pathway in treating cancer." ■

Grateful to Give

Clinical Care Inspires Gendron Family to Support Cancer Research Innovation

Philanthropy has myriad motivations; there are as many reasons to give as there are causes in need of support. For Roger J. and Susan Gendron, the reasons are simple: first, their son Theodore is a recent graduate of the George Washington University (GW) School of Business, earning a bachelor's degree in business administration in May 2016; more significantly, however, Susan is a breast cancer survivor under the care of Robert Siegel, M.D., '77, associate center director for education

and training at the GW Cancer Center (GWCC) and professor of medicine at the GW School of Medicine and Health Sciences (SMHS).

"Dr. Siegel is a miracle worker and has been a comforting source of healing and inspiration," Susan says. She adds that her experiences at the GW Medical Faculty Associates and at GW Hospital were exceptional. "The staff, nurses, and physicians have made my journey much more bearable due to their compassionate care and professionalism."

In recognition of the treatment Susan received from Siegel, the couple made a \$2.5 million gift to GWCC to establish the Gendron Family Cancer Research Fund. The fund will support basic and translational science research,

as well as contribute to pilot research grants for residents and fellows. "Giving back is our way of saying thank you," Susan says.

"We're bringing innovative research to areas in need," explains Eduardo M. Sotomayor, M.D., director of GWCC, director of the Division of Hematology and Oncology, and professor of medicine at SMHS. "We are not just repeating what other cancer centers are doing — we're coming with our own set of unique ideas."

Thanks to the Gendron family's gift, he adds, the opportunities for collaboration around pilot funding resources will blossom, "dramatically increasing our capacity to impact both cancer research and clinical care." ■



For the second consecutive summer, John D. Evans and Steve Wozencraft welcomed members of the GW School of Medicine and Health Sciences (SMHS) to their Sag Harbor, New York, home for a special reception to benefit two SMHS organizations: The Research Center for the Eradication of HIV and The Rodham Institute for Health Care Provider Education to Eliminate Disparities. This year's event took place aboard Evans and Wozencraft's yacht, the Waterford.

As a select group of guests cruised Sag Harbor Bay, Jeffrey S. Akman, M.D., '81, RESD '85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of SMHS, as well as Douglas F. Nixon, M.D., Ph.D., Walter G. Ross Professor of Basic Science Research and chair of the Department of Microbiology, Immunology, and Tropical Medicine at SMHS, and Jehan El-Bayoumi, M.D., RESD '88, founding director of The Rodham Institute and professor of medicine at SMHS, offered updates on the latest developments at SMHS. ■

Support from Sag Harbor



CLASS NOTES

DISTINGUISHED AMONG US: GW School of Medicine and Health Sciences alumni, **André J. Nahmias, M.D. '57, M.P.H.** (left), and **Lieutenant General Nadja Y. West, M.D. '88** (center), were among the recipients at the 80th Annual Alumni Achievement Awards ceremony on Oct. 27.

Nahmias, an Emeritus Professor of Pediatrics and Public Health at Emory University, was honored for his contributions to research, clinical care, education, and child advocacy. West is the 44th Surgeon General of the United States Army and Commanding General of the U.S. Army Medical Command.



Alex Jeffrey Mechaber, M.D., RESD '97, FACP, professor of medicine and senior associate dean for undergraduate medical education at the University of Miami Miller School of Medicine, recently received the Dr. Bernard J. Fogel Chair in Medical Education for his 18 years of outstanding service to the school.

"Alex was my first chief resident," recalls Alan Wasserman, M.D., chair of the Department of Medicine and Eugene Meyer Professor of Medicine at SMHS. "I am very proud of his accomplishments."

Mechaber is just the second holder of the endowed chair, named in honor of former dean Bernard J. Fogel, M.D., who served from 1981 to 1995.

"I was both surprised and humbled when I was notified that I would be receiving the Fogel Chair," says Mechaber, who graduated from the Miller School in 1994. "Bernie was my dean when I was in medical school, so to hold the chair named for him is especially meaningful to me."

Mechaber's wife **Hilit Mechaber, M.D., RESD '98**, also completed her internal medicine residency at GW and serves as associate dean for student services at the Miller School of Medicine.

Luther W. Brady Jr., M.D. '48, HON '04, B.A. '46, A.A. '44, was recently awarded his seventh honorary degree, from Complutense University in Madrid, Spain.

Kenneth Fisher, M.D. '68, recently published a book, *Understanding Healthcare: A Historical Perspective* (Freedom in Health Care, 2016).

Ira Spar, M.D. '68, RESD '75, published his second book, *Civil War Hospital Newspapers: Histories and Excerpts of Nine Union Publications* (McFarland & Company, Inc., 2015). The book – a follow-up to his 2013 work, *New Haven's Civil War Hospital: A History of Knight U.S. General Hospital, 1862–65* (McFarland) – examines the founding and development of internal Union hospital newspapers, which were written and published by patients, during the Civil War. Spar is a U.S. Army Vietnam War veteran and is a board member with the Society of Civil War Surgeons. He is also president of the Hartford (Connecticut) Medical Society and a fellow with the American Academy of Orthopedic Surgeons.

Steven E. Cohen, PA-C '83, joined the SMHS faculty as a clinical instructor in the Physician Assistant (PA) Studies program. Previously, Cohen served as a senior neurosurgical PA at Suburban Hospital, a community-based, not-for-profit hospital serving Montgomery County, Maryland.

Scott Rifkin, M.D. '85, CEO of Mid-Atlantic Health Care, won the 2016 EY Entrepreneur of the Year award in the Maryland region in the growth category. The award recognizes entrepreneurs who demonstrate excellence and extraordinary success in such areas as innovation, financial performance, and personal commitment to their businesses and communities.

Lane R. Rosen, M.D., RESD '97, medical director of radiation oncology at Willis-Knighton Health System, was honored with the 2016 Louisiana State University–Shreveport Distinguished Alumni Award.

Mark R. Greenwood, M.D. '00, was selected as the new primary care clinical program medical director with Intermountain Medical Group. Greenwood is a board-certified family medicine physician who has been practicing at Sevier Valley Clinic in Richfield, Utah, since 2003, and he has also served as the medical director in the medical group's central rural region since 2012.

Samantha Brugmann, Ph.D. '05, received the Presidential Early Career Award in Science and Engineering (PECASE). Brugmann, an assistant professor of surgery at Cincinnati Children's Hospital Medical Center, was among 105 researchers to receive the 2016 award, the highest honor bestowed by the United

CLASS NOTES

States government on science and engineering professionals in the early stages of their independent research careers.

Jessica Langenhan, M.D. '05, recently earned an M.B.A. with honors from the University of California-Los Angeles Anderson School of Management, graduating from the Fully Employed MBA program in June 2016.

Langenhan was also named associate medical director of the substance abuse program at Laguna Treatment Hospital in July 2016.

Daniel O'Neill, M.D. '13, will practice general internal medicine at the Neighborhood Health Center in Portland, Oregon, serving as the anchoring internal medicine physician for the new clinic site for Portland's underserved populations. O'Neill is a primary care physician specializing in HIV and LGBT health, who recently completed his residency training in internal medicine at Virginia Mason Medical Center in Seattle.

Randall Owen, M.S.H.S. '13, PA-C '13, has been appointed as a research fellow in global health and social medicine at the Harvard Medical School for 2016-17. Owen, who completed his physician assistant surgical residency at the Norwalk Hospital/Yale School of Medicine, is a former medical operations specialist at NASA Johnson Space Center, where his research interests included the ethical and policy challenges surrounding the medical and surgical care delivery systems being developed to support long-duration space missions.

Andrace Deyampert, M.S.H.S. '14, was among the recipients of the 2016 U.S. Food and Drug Administration Outstanding Service Award.

Jeff Farnsworth, DPT '15, has been named director of physical therapy at the National Sports Medicine Institute in Virginia.

IN MEMORIAM

Nicholas A. Balsano, M.D. '65

Gilbert D. Barkin, M.D. '53, B.S. '49

James P. Burns, M.D. '49, RESD '52, A.A. '45

John Timothy Chapman, M.D. '55

Joseph Bernard Credle, M.D., RESD '72

Paul H. Daines, M.D. '58, RESD '78

Justin Adam Dalton, H.S. '05 (CERT)

Neilson T. Debevoise, M.D. '56

Andrew M. Diggs, M.D., RESD '53

Albert F. Esch, M.D. '54, M.A. '50, B.S. '49

Cynthia A. Evans, M.D., RESD '87

John S. Featherston, M.D. '46

Edward E. Gahres, M.D., RESD '59, M.A. '51

Joel S. Ganz, M.D. '61

Warren Gillette, M.D. '50

Thomas H. Gresinger, M.D. '61, RESD '66

William M. Kane, M.D. '54

Adolphe C. Kiczales, M.D. '55, A.A. '49

Jerome H. Komisarof, M.D., RESD '60

Harold Lichtenstein, B.S. '49

John Gage Mahaney, M.D. '54

Douglas B. McMullen, M.D. '66

Robert Mrkich, M.D. '63

Manfred R. Nelson, M.D. '62

Thomas M. O'Neill, M.D. '65

Beale H. Ong, M.D. '59, B.A. '55, A.A. '53

Ronald Ottenberg, M.D. '59, RESD '67, B.S. '56, A.A. '55

Frederick Turner Reuter, M.D. '44

Surendra R. Rishi, M.D., RESD '69

Allan Schonberg, M.D. '73

Albert L. Sheffer, M.D. '56

Leo H. Siegel, M.D. '43

Charles G. Wellso, M.D. '53

Save the Date!

REUNION WEEKEND 2017

September 15 -17, 2017

This year we are celebrating the reunions for the M.D. classes from

**1967, 1972, 1977, 1987,
1992, 1997, and 2007**

Get involved now by contacting
smbsalumni@gwu.edu or (202) 994-7511

School of Medicine
& Health Sciences

THE GEORGE WASHINGTON UNIVERSITY

*See you back
on campus soon!*

IN DEVELOPMENT



Scholarship support is helping many of our students fulfill their dreams of becoming health care professionals. Extraordinary, long-term financial sacrifices are often required to pursue degrees in medicine and the health sciences. The debt burden facing graduates across the country can be severe. Among GW's Class of 2016 M.D.

program students, more than half graduated with significant debt, some with obligations exceeding \$200,000. Those are daunting figures.

Likewise, students in the health sciences programs often leave campus with large debt loads. In a survey of the Class of 2016 physical therapy and physician assistant students, a sizable percentage reported six-figure debt.

The high cost of pursuing an education in an expensive city such as Washington, D.C. limits the school's ability to recruit top students, especially those from less affluent families. The availability of scholarships can address that situation. We want to ensure that when students face career decisions — such as which specialty to choose or where to practice — they are free to base those decisions on their passions and callings, and not on financial anxiety and pressure.

We need to tackle this problem by finding ways to reduce the debt load. Scholarships are one of the most effective tools for accomplishing this task. To that end, we are working to raise at least \$4.5 million in new scholarships this academic year through philanthropic contributions. Our website, smhs.gwu.edu, provides detailed information on this effort.

GW already offers more than 70 endowed scholarships in the School of Medicine and Health Sciences (SMHS). The benefactors who created those scholarships as well as those who contribute to them have always expressed satisfaction in being able to help others, particularly students pursuing their dreams in medicine and the health sciences.

We want to ensure that no qualified student is forced to pass up a career in medicine or the health sciences because the cost of education is too high. The goal of SMHS is not only to attract the best and brightest students to GW, but also to help reduce or eliminate the crushing financial burden that they can face upon graduation. All alumni and friends are invited to participate in the SMHS scholarship campaign. For information about supporting our scholarship fund, please contact Sumana Chatterjee at (202) 994-6724 or schatter@gwu.edu. Please join us in this cause.

Sincerely,

Dennis Narango, M.A., CFRE

Associate Dean, SMHS, and Associate Vice President for GW Medicine Development and Alumni Relations

P.S. If you are 70 ½ or older, you can take advantage of a simple way to benefit the GW School of Medicine and Health Sciences and receive tax benefits in return. You can give up to \$100,000 annually from your IRA directly to SMHS without having to pay income taxes on the money. These gifts count toward your IRA's minimum distribution requirements and benefit you regardless of whether you itemize deductions on your income tax returns. Visit gwu.planmylegacy.org/ira-charitable-rollover for more information.

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Ophthalmology, Ellsworth Uveitis & Retina Care

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OB/GYN; Founder, Center for Integrative Medicine, GW School of Medicine and Health Sciences

Smita H. Patel, M.D., DFAPA

Psychiatry, Assistant Clinical Professor of Psychiatry and Behavioral Science, GW School of Medicine and Health Sciences

Richard G. Popiel, M.D. '81, RESD '83, M.B.A., B.S. '75

Internal Medicine; Executive Vice President, Healthcare Services, Chief Medical Officer, Cambia Health Solutions & Regence Health Insurance Company

Rakesh C. Sahni, M.D.

Cardiology; Maryland Cardiology Associates

Mark W. Surrey, M.D. '72, FACOG, FACS

OB/GYN-Reproductive Endocrinology; Professor & Clinical Director, Reproductive Surgery, UCLA; Co-Founder and Medical Director, Southern California Reproductive Center

Allan B. Weingold, M.D., HON. '98

OB/GYN; Professor Emeritus, Former Chair of OB/GYN, Former Vice President for Medical Affairs and Executive Dean, The George Washington University

Art B. Wong, M.D. '67

Emergency Medicine; Founder, Emergency Physicians Medical Group, PC

The SMHS Board of Advisors offers the dean of the School of Medicine and Health Sciences recommendations on strategic priorities and important issues for the school, and provides generous support and advocacy.

School of Medicine & Health Sciences

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THE POWER AND PROMISE OF MEDICINE

Marcus Mitchell, a fourth-year medical student at SMHS and recipient of the Power and Promise scholarship, found himself relieved with the reduction of his student loan debt and inspired to give back. "I want to have my own scholarship fund," he says, "and help some [unsuspecting] student who's doing a good job."

Read more on page 29.