Welcoming the Class of 2021!

PLUS:

Innovation Propels University Hospital
Father and Son Share Dream to Save Children with Cancer
IT Boosts NJMS Research to New Heights
Look around University Hospital and it is apparent that remarkable changes are afoot there. From the newly renovated lobby, unveiled in August, to its heightened attention toward providing world-class service to patients and to all who enter its facilities, there is no denying that this Newark mainstay is positioning itself as a premier academic medical center for our region and beyond.

For decades now, New Jersey Medical School and University Hospital have enjoyed a close relationship. Some might even call it a symbiotic one rooted in a shared commitment to providing our patients with top-notch care; to ensuring that future generations of doctors receive superior training; to conducting research aimed at eliminating illnesses that are a scourge on our society; and to serving the community in our mission to improve health outcomes for those who live in and around the city of Newark.

Our alliance goes back to 1968 when our school, then known as New Jersey College of Medicine and Dentistry, assumed operation of the hospital. Although University Hospital is now a standalone institution, I have had the good fortune of personally bearing witness to its growth throughout the years—first as a medical student, then as a resident, and now as a physician and Board of Directors member.

Over the decades, our primary teaching hospital has been on the leading edge of patient care and scientific study with NJMS serving as the source of much of its clinical faculty. It is where research by esteemed NJMS physician and alumnus James Oleske, MD’71, led to the discovery of pediatric AIDS. It was among the first in the state to establish a division of adolescent medicine, a personal passion of mine. And it has served as the bedrock of the community’s well-being by seeing it through various public health crises like drug and lead poisoning epidemics and by pioneering responses to conditions like stroke, heart disease, and cancer, among others.

In recent months, announcements have been made concerning new and exciting clinical collaborations that will allow our school to expand its reach beyond the borders of Essex County. One collaboration has us poised to manage acute-care activities at Bergen Regional Medical Center, Bergen County’s public hospital. The other establishes a partnership between RWJBarnabas Health and Rutgers that will ultimately lead to the creation of the largest academic health care system in New Jersey.

Indeed, great things are on the horizon for our school and that is in no small measure to our long-standing relationship with University Hospital. It is an alliance that has helped to solidify both our reputations as leaders in health care, not just for today but for the foreseeable future.

In health,

Robert L. Johnson, MD, FAAP’72
The Sharon and Joseph L. Muscarelle Endowed Dean
Rutgers New Jersey Medical School
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Nonprofit Students 2 Science, Inc. (S2S) aims to inspire elementary, middle and high school students to pursue careers in science, technology, engineering and math (STEM). Through S2S, science professionals from a variety of backgrounds volunteer as teachers and mentors. Graduate students and postdocs from NJMS and Rutgers School of Graduate Studies (SGS) participate in the program under the guidance of SGS program director Doreen Badheka, PhD. In the essay below, SGS PhD student Aminat Saliu-Musah describes her experiences with S2S.

**Inspiring Young People to Pursue STEM Careers**

Engaging young students in science activities may seem a daunting task. For many, the memories of science class are painful: you were required to sit still in a classroom and pay attention, with little or no interactive learning. With this teaching method only a handful of students retain any interest in pursuing a STEM career. This approach does not reflect the true culture of research and the scientific work environment.

S2S volunteers come from a wide range of professional backgrounds, from industry to academia—all with a common mission to debunk the perception of science and engineering as unattainable career paths. I had the exciting opportunity to volunteer with S2S for a day of experiments. What I found most fulfilling was the opportunity to get students excited about science and solving problems.

Mentors, lab instructors, and volunteers create fun, age-appropriate experiments for middle school and high school students to perform using real laboratory equipment. The experiments all relate to aspects of daily life. For example, an oil spill in the Gulf of Mexico in 2010 polluted the ocean, endangered marine life, and closed many beaches. So one of the experiments performed by students measured the level of contamination in beach sand.

Participating in S2S offers many benefits to volunteers as well. Strong medical communication skills are a must for science professionals. Teaching scientific theory to middle school students is a great way to build communication skills. Because many S2S volunteers work in the pharmaceutical industry, volunteering offers opportunities to network with other science professionals. S2S’s facility is a state-of-the-art lab, so all participants gain the experience of working with industry-grade high throughput equipment.

Of course, not every young student who participates in this program will end up becoming a scientist, but the scientific thinking mode is surely a transferable skill that can be applied to any chosen field. —Aminat Saliu-Musah

**Hot off the Press: Second Issue of Student Literary Journal**

The second issue of *Ars Literarium*, NJMS’s student-run literary journal, features creative writing and artistic work of students and faculty. The journal includes short stories, poetry, digital photography and art, all with a focus on the art and science of medicine. The issue, co-edited by NJMS students Emily Moore and Shanen Mulles, is available online at njms.rutgers.edu/about_njms/pulse_ebook/Ars_Literarium_Spring_2017.

For information about contributing to the journal, email ars.literarium@gmail.com.
Rutgers School of Health Professions (SHP) and NJMS are improving care for patients in Newark through a new physician assistant (PA) faculty practice—the first of its kind in the U.S. The faculty practice, located at Newark Beth Israel Medical Center, has hired four of its anticipated five physician assistants to work with faculty surgeons from the NJMS departments of orthopedic surgery and neurosurgery.

While it is standard for medical schools to hire full-time clinical physicians who practice in hospitals and work with students doing clinical clerkships, Rutgers is the only school in the U.S. to apply this model to PAs. The physician assistants serve in the operating room, perform consultations in the Emergency Department and see patients in the NJMS offices and affiliated surgical centers. In addition to improving efficiencies in serving patients, the model also allows for guaranteed clinical placement for students, who will be placed in rotations by early 2018.

Above: Rachid Assina, MD, Department of Neurological Surgery, consults with physician assistant Sylvia Ardeljan-Savic at Newark Beth Israel Medical Center.

New PA Faculty Practice First of Its Kind in the U.S.

Success When ‘It’s Never the Same Job Twice’

NJMS chief operating officer Walter Douglas was the subject of a feature article in the May 2017 issue of The Positive Community magazine. The profile provides an overview of Douglas’ long career at NJMS, describing his unique skill set that “fits diverse pieces of a complicated puzzle together and makes everything work.” Among his most noteworthy accomplishments, Douglas cites his involvement in NJMS’s Student Training & Education Program, or STEP, which offers students from high school through graduate school a look at the business side of an academic medical center. He’s also proud of his role in the integration of UMDNJ with Rutgers. The Positive Community is a faith-based lifestyle magazine targeted to the African American market in the New York/New Jersey area.

Read the article here: https://issuu.com/thepositivecommunity/docs/may2017

‘TOPS’ in Her Field of Pathology

Valerie Fitzhugh, MD, was named an American Society of Clinical Pathologists (ASCP) 40 Under Forty TOP FIVE honoree for 2017. She is among five high-achieving pathologists and medical laboratory professionals under age 40 who were selected for this recognition.

ASCP first identifies 40 outstanding pathologists, pathology residents, and laboratory professionals who have made significant contributions to the profession and exemplify leadership. From this group, the TOP FIVE honorees are then selected.

Fitzhugh, an associate professor of anatomic and clinical pathology, did her residency at NJMS and completed a fellowship in cytopathology at the Mount Sinai School of Medicine. Her special interests include bone and soft tissue pathology, resident and medical student training, and pathology education through social media.

Mark Granick Named to National Leadership Position

Mark S. Granick, MD, has been selected to join the Education Board at the American Health Council, an organization dedicated to improving Americans’ physical and mental health. Granick, a professor of surgery and chief of plastic surgery at NJMS and professor of surgery at RWJMS, is nationally recognized for his outstanding skills, particularly in the areas of surgical wound care and complex reconstructive surgery from injury and cancer. At NJMS, he’s developed an outstanding plastic surgery residency program. He has authored more than 150 peer-reviewed publications, edited nine textbooks, and written more than 50 book chapters. He is a founder of the Journal of Wound Technology.
NJMS Serving Communities

With an endless capacity for caring and helping others, volunteers from NJMS and other RBHS schools and units give their time generously to help those in need.

Big Grins, High Fives!

UH, RBHS Volunteers Provide Health Screenings at Back 2 School Store

“I got the coolest stuff!” said one young boy to his father after attending the ninth annual National Council of Jewish Women (NCJW)/Essex Back 2 School Store (B2SS) on July 30. “My new backpack makes me feel smart and important!” said another child.

With walls lined with coats, rows of brand-new sneakers and racks of clothing, the B2SS outfitted nearly 800 economically disadvantaged children with the help of 475 volunteers. While the children shopped cost-free for new clothing, school supplies, and personal care items, their parents and caregivers were able to take advantage of health screenings and education offered by University Hospital (UH), volunteers from NJMS, and other RBHS staff and faculty members.

“University Hospital provided meaningful health services, including blood pressure and glucose screenings for almost 400 individuals,” said Sara Peña, senior community outreach coordinator at UH. “Our volunteers also offered financial counseling and information on women’s health and smoking cessation to hundreds of attendees.” Volunteers from the NJMS Student Sight Savers, an organization dedicated to eliminating preventable eye disease, performed approximately 300 vision screenings. In addition, volunteers from Rutgers School of Dental Medicine and the Cancer Institute of New Jersey at University Hospital were on hand to provide education and information.

By the end of the spree, each child had a big bag of clothing and a backpack filled with personal care items and school supplies. Their parents and caregivers were healthier too. “All the information we provide is in both English and Spanish and most of our volunteers are bilingual,” adds Peña. “Our goal is to empower families to live healthier lives.”
NJMS Clinical Research Center Celebrates PRIDE

Models—male, female, and transgender—strutted their stuff at STRUT|Redefine Runway Realness, a fashion show held on July 15 at the Paul Robeson Campus Center. NJMS’s Clinical Research Center (CRC) was a co-sponsor of the event, along with Newark Pride, Inc., an annual celebration of diversity across the LGBT spectrum. The fashion show presented safer sex messages and information on HIV care and treatment services, hormone therapy, and clinical research studies conducted at the CRC and Infectious Disease Practice. Mobile units from community agencies were on hand to test for HIV, hepatitis C, and sexually transmitted diseases, and students from the Rutgers School of Nursing provided blood pressure screenings and glucose checks. See video footage and photos from the event on Facebook: @THEAMP STUDYNJ.
Running to a Crisis

In the aftermath of Hurricane Harvey, physicians, nurses and other medical professionals from across the country rushed to Houston to provide much-needed support. Adam Fox, DO, assistant professor of surgery and section chief of trauma, was one of them.

Fox is a member of the Trauma Critical Care Team (TCCT), a government disaster team providing surgical and critical care services wherever they are needed. “We’re prepared to respond to disasters both nationally and internationally,” says Fox. “My specific role on the team will depend on our mission. It might involve operating, or providing critical care, or both. We have a complete team and specialized equipment that supports this mission, including a full operating room and ICU that are sent wherever we go.”

The team was deployed to Houston to fulfill two missions: providing surgical and critical care services to hospitals that needed them; and providing critical care for patients being evacuated. “We were here for almost a week, working out of a hangar at the George Bush International Airport along with an Air Force medical evacuation team. While there was no need for our surgical skill set, we provided critical care support to patients with needs such as ventilator management and dialysis patients with metabolic derangements.”

TCCT, as part of the U.S. National Disaster Medical System (NDMS), helps fill in the gaps to supplement health systems and response capabilities in times of crisis. NDMS is a federally coordinated health care system and partnership of the Departments of Health and Human Services, Homeland Security, Defense, and Veterans Affairs.

Fox is a member of TCCT-East, one of the three TCCT divisions. “I’m lucky enough to have a relatively unique skill set that is beneficial in times of disaster and crises. When the opportunity to join this incredible group of people presented itself a number of years ago, I couldn’t resist. The commitment, compassion, and drive of this team is truly exciting and makes me happy to participate. To help people at what is often the worst time of their life is an extension of the job we do every day in Newark and creates an immense feeling of satisfaction.”
Surgeon Travels World
Training Peers in Developing Nations

Richard Agag, MD’04, oversees microsurgeries in Nepal on latest volunteer mission with ReSurge International.  

Richard Agag’s hands have healed hundreds around the world. The NJMS-trained surgeon, who is an associate professor of surgery and the chief of the Division of Plastic Surgery at Rutgers Robert Wood Johnson Medical School, has reconstructed the mangled limbs of accident victims facing amputations, performed complex burn surgeries and repaired the cleft lips and palates of ostracized children from New Brunswick to Katmandu.

But the work Agag considers most valuable are the surgeries he can hand over to other surgeons.

Those, he said, are the signs of successful ReSurge International missions that reflect the time he’s spent training surgeons in developing nations so they can better care for their communities.

“I’m not there to show them that I can do the surgery, but to stand back as much as I can and help them so they can do the surgery when I am not there,” Agag said. “It’s great to go in, help people and leave, but the reality is that is not a long-term solution. The long-term solution is empowering people.”

ReSurge International (formerly Interplast) was founded in 1969 to provide reconstructive surgical care and build surgical capacity in developing countries. Today more than 80 percent of the nonprofit’s surgeries are performed by developing world surgeons with ReSurge oversight, training and support.

Agag, who lives in Manhattan, joined the organization in 2010. He spent that year hop-scotching the globe—Zambia, Mali, Bolivia, Ecuador, Peru, Taiwan and beyond. For a portion of the trips, he traveled with different volunteer teams of surgeons, pediatricians, and nurses from ReSurge. The rest were solo missions where he spent time and operated with local ReSurge outreach surgeons—teaching and learning.

Since that fellowship, Agag has participated in ReSurge missions to the largest pediatric hospital in Hanoi, Vietnam, and most recently, spent 10 days in Nepal this January. He was part of a small team that ReSurge will be sending to the South Asian country every six months to teach them microsurgical reconstruction techniques.

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See, Test & Treat
Free cervical and breast screening program brings benefits of diagnostic medicine to Newark’s uninsured and underinsured. BY GENENE W. MORRIS

Fact: When it comes to fighting—and overcoming—the bane of breast and cervical cancers, early detection is crucial. But it’s also an uncomfortable truth that for many uninsured and underinsured women, early detection can be a nebulous notion, an elusive luxury reserved only for those who can afford regular visits with their doctors.

These are the women who go years without breast and cervical screenings, only showing up in their local emergency departments or at the offices of gynecologists like Damali M. Campbell-Oparaji, MD, when they no longer can deny that something is exceedingly wrong. “I frequently see women when it’s too late,” explains the Rutgers New Jersey Medical School assistant professor of obstetrics, gynecology and women’s health.

“They already have abnormal bleeding. They already have a mass. They are fearful.”

It is these experiences that spurred Campbell-Oparaji along with colleagues, Debra S. Heller, MD, and Basil Hubbi, MD’03—with the encouragement of Mark H. Einstein, MD, chair of obstetrics, gynecology and women’s health—to team up and bring the benefits of diagnostic medicine to women of Newark and surrounding communities through a program called See, Test & Treat.

A nationwide project of the College of American Pathologists (CAP), See, Test & Treat is a free cancer screening and health education program that aims to save women’s lives through early detection; empower families through preventive health care; and connect communities with health care providers.

Current statistics by the American Cancer Society (ACS) show how much programs like these are needed. According to the society’s “Cancer Facts & Figures 2017” report, invasive breast cancer will be diagnosed in about 252,710 women in the United States this year and approximately 12,820 new cases of invasive cervical cancer will be identified. And while an estimated 40,610 women will die from breast cancer and around 4,210 deaths from cervical cancer will occur in 2017, the ACS report shows that—thanks partly to improvements in early detection through increased awareness and screenings—mortality figures for both cancers have decreased over the years, with female breast cancer deaths dropping by 38 percent from its peak in 1989 to 2014 and cervical cancer deaths being less than half that in 1975.

But there’s an additional benefit to catching the disease early, notes Hubbi, an assistant professor of radiology. “Early detection doesn’t just confer benefits for mortality in that it detects cancer for women who do not know they have it, but it also confers, I think, a morbidity benefit where the treatment will be easier and less disfiguring.”

Made possible through a $20,000 grant from the CAP Foundation and additional support from the Foundation for University Hospital, the day-long event was held at Rutgers Cancer Institute of New Jersey at University Hospital in Newark on Saturday, October 14, providing dozens of women with a seamless flow of health care services. Participants received free pelvic and clinical breast exams as well as Pap tests by Campbell-Oparaji and other New Jersey Medical School obstetrician-gynecologists. Once cervical samples were collected and placed in vials, they were ferried by New Jersey Medical School students to screeners who prepared and studied the slides, referring abnormal or high-risk cases to Heller for further evaluation. What’s more, women 40 or older or with a family history of breast cancer, were referred for free mammograms.

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Powerful Partnerships Benefit New Jerseyans

Across the state, Rutgers clinicians and faculty bring the highest quality health care to an ever-widening population. See how we’re growing.

Creating NJ’s Premier Academic Health System

Rutgers and RWJBarnabas Health are joining forces to create the state’s largest academic health care system dedicated to providing the highest quality patient care, leading-edge research and world-class education to improve the lives of New Jerseyans.

This partnership aligns RWJBarnabas Health, New Jersey’s largest health care system; Rutgers; and Rutgers Health Group, a faculty practice of some 1,000 physicians, dentists, psychologists, nurses, pharmacists and other professionals. The alliance will create a multi-specialty group comprised of more than 2,500 practitioners—one of the largest medical groups in the country. The exciting venture will enhance the delivery and accessibility of clinical services across the state, boost the recruitment of outstanding faculty, and advance health science innovation and education.

Patients throughout New Jersey will benefit from increased access to providers offering medical and dental care as well as behavioral health and addiction services. Eventually they will have access to newly developed centers of excellence offering groundbreaking clinical innovation, and to clinicians who are leaders in their fields.

Through the partnership’s unique structure, RWJBarnabas Health and Rutgers will remain separate corporations. Rutgers faculty will remain Rutgers faculty and Rutgers will provide clinical services to RWJBarnabas Health through Rutgers Health Group. Rutgers and RWJBarnabas Health are recruiting leading academic, research and clinical practitioners, with a shared goal of developing centers of excellence; investing in clinical, academic and research innovations; educating health professionals; and improving health through coordinated patient outreach, prevention and treatment of disease.

“Our new alliance will better enable us to educate the next generation of health care professionals and offer the top-tier health education and training necessary to provide health care in an ever-changing environment, developing one of the best academic health systems in the country,” said Rutgers Biomedical and Health Sciences Chancellor Brian Strom, MD.

NJMS has teamed up with Bergen County mental health care provider Care Plus NJ and Integrity, Inc., to oversee the management and operations of Bergen County Regional Medical Center, a 1,000-bed facility providing acute care, behavioral health, long-term care and other services. The new entity, named Care Plus Bergen, further expands NJMS’s clinical reach.

The three partners, all standouts in their respective fields, have collaborated through the years. They share a vision for management of the hospital, which has traditionally served as a safety net for those requiring mental health or substance abuse treatment. While the hospital’s core mission—treating people with mental health and substance abuse problems—will remain, the new leadership plans to extend addiction treatment and offer enhanced medical services.

NJMS’s role in the partnership is to provide acute care and clinical leadership, as well as support the growth and expansion of ambulatory services. Care Plus NJ will assume oversight for behavioral health services. Integrity, the state’s largest substance abuse treatment and recovery agency, will manage substance abuse services, including inpatient detox, residential and outpatient care.

An important aspect of the plan is the integration of medical and mental health care and enhanced support services for patients after they are discharged. To increase the availability of specialists in inpatient services, CarePlus Bergen expects to add approximately 50 new physicians to the medical staff over the next three years.

The vision is to provide a medical home of specialty care services for residents of Bergen County and northern New Jersey, treating patients across the entire continuum of care to keep people well at home.
Researchers and IT
Perfect Together

The IT Department is at the ready to help NJMS researchers face the challenges and reap the benefits of the brave new world of technology. BY TY BALDWIN

Computer technology has changed greatly in the last two decades. The refrigerator-size mainframe gave way to the personal computer. The desktop was pushed aside by the laptop, which itself has been largely supplanted by the smartphone in our pockets. And now computing power and information live in “the cloud.”

These innovations have transformed the way we bank, shop, and even find love—and have also altered the terrain for researchers. No longer are they required to dig through stacks of journals to find the article they need. A few words typed into a search engine, and the information is at one’s fingertips. Data is gathered, stored, and searched by a computer in a fraction of the time such tasks used to take an ordinary mortal.

Researchers at NJMS reap the benefits, but also face the challenges of this brave new world. Fortunately, the IT Department can help them make the most of this new technology.

“I’ve had the splendid cooperation of the folks in the IT Department,” says Jacob Lindenthal, PhD, professor of psychiatry. “I’m very, very grateful to them.”

“Any time we have an issue, the folks in IT are right there,” adds Robert Donnelly, PhD, professor of pathology and laboratory medicine and director of the Molecular Resource Facility. “If we crash our server because we try to give it too much data, they’re able to fix it right away.”

Jim Boyce, director of the IT Department at NJMS, gives all credit to his staff (see box at right). “They’ve put together several tools to help researchers,” he says. “We have dedicated research storage, both regular and encrypted. Cloud storage and file share allow colleagues to transfer documents and share and store data. We’re here to help researchers use these new technologies to enhance their work.”

Lindenthal’s technology needs actually began back in the Dark Ages (i.e., before the Internet). “I completed my PhD in history in 1973,” he says. “My dissertation included a chapter on health conditions of American Jews. I had this information amassed and I
decided, well, maybe the thing to do is to go into this much deeper.”

He spent the next three decades reviewing literature in American medical journals, community health reports, conference proceedings, dissertations, and insurance and hospital reports. “Many medical students assisted me in compiling this compendium,” he says. “They learned a lot about epidemiology and biostatistics.” By the time he finished, Lindenthal had created the first ethnic database of disease. Appropriately enough, it’s called The Lindex.

“To publish all of this would require multiple volumes, so we decided to put the Lindex on the Internet. But with the evolution of computers—when we started, everything was on five-by-eight-inch discs—we needed help.”

“With the Lindex, we got involved on the programming end,” Boyce explains. Any project that had been in the works since the 1970s was going to require work to make it compatible with today’s computing standards. “We were able to improve the search interface and host the application on a server.”

“Because of the efforts of the IT Department, the Lindex is a much more valuable tool,” Lindenthal adds.

For Donnelly the challenges were different. He didn’t have 30 years worth of scholarly material to search, but rather terabytes of data about the human genome that needed to be shared and analyzed among colleagues.

“At the Molecular Resource Facility, we’re sequencing RNA, which tells us in a particular sample what genes are actually being expressed,” he explains. “Let’s say you take a tissue from a healthy individual and a tissue from a diseased individual. We sequence the RNA in each of those samples, and we want to know what’s the difference. It’s critical that we analyze this data weekly, if not more frequently.”

“We generate enormous data files, terabytes in size,” he adds. “To utilize that data, we need a lot of computing power. About five or six years ago we purchased a data-analysis package and a server to run this package. The IT group set up the server for us, and they maintain it so that we’re able to provide the investigators with data they can use, as opposed to a gigantic data file that they would never use.”

“Dr. Donnelly and other researchers push large data sets back and forth through various devices to analyze and store it,” Boyce explains. “So we installed a high-speed network that provides one gig throughput horizontally and 10 gig vertically.” However, because the Medical Science Building network didn’t support that capacity, the IT Department had to find a way to make it work. “We knew there were some niche users, so we were able to target that capacity to the core facility group that Dr. Donnelly’s a part of. That way we could do it for a much more effective lower cost to get sort of a bang-bang return.”

“This is such a new technology,” Donnelly says, “and it’s constantly changing. There are updates to the software at least quarterly, and often monthly. Whenever the company notified me that they have a new version of the software, I contact IT and they go in and clean up the server and put in the new version. Any time we have an issue with that server, the IT Department is right there.”

Left to right: Robert Donnelly, PhD, Jacob Lindenthal, PhD, and Jim Boyce

IT @ NJMS

Members of the IT Department include:

cloud and server technology, Arnold Rodriguez and Juan Rodriguez; academic systems, Courtney Terry and Stephanie White; audiovisual and web, Raj Arumugam, Darryl Carrington, Trevor St. Hill, Bryan Klucharits, and Audrey McNeil; programming, Yongmin Shen, Matt Wolfman and Yihua Ye; and user services, Keston Harewood, Elaine Hughes, Nelson Pared and Barry Wise.
“They may be a small country but they have very complex surgical problems,” he said. “Every day we’d see two, three, four patients with significant reconstruction dilemmas. Any of which would be difficult even to manage in the U.S.”

During his time in Nepal, Agag participated in multiple free flap surgeries—a complex procedure where healthy tissue and blood vessels are transferred from one part of the body to an area where there is a defect. Each of these surgeries can take an entire day to perform. Among those treated was a woman with a recurrent tumor of her forearm facing amputation; a teenage girl who lost her scalp in a tragic accident on the playground; and a little girl whose previously unsuccessful cleft palate surgery had left a hole the size of a silver dollar in the roof of her mouth.

Agag said these surgeries can drastically alter the course of these patients’ lives. “People who have cleft palates (especially large ones like the girl in Nepal) have difficulty speaking—they don’t go to school, they stay home,” he said. “And in a developing country, if you get an amputation, you are almost guaranteed to be begging for money in the street. Having a prosthesis is almost unheard of.”

One look at the before and after pictures of ReSurge patients and the impact of Agag’s work is obvious. But what is his takeaway? With each mission, he said his passion for medicine is reinvigorated by the dedication displayed by local surgeons and the connections he makes with families.

“It’s like you’re stripping away all the fluff in medicine. It’s just you, another surgeon and a family. There’s no one else involved. It’s pure and rewarding for us,” he said. “We are helping people but also the local surgeons provide better care for their patients. When I come back to the United States and Rutgers, I know I will be able to take better care of my patients from what I have seen and learned from these doctors.”

See, Test, and Treat

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performed by a mammography technologist working with Hubbi, who read the images for signs of cancer.

One of the remarkable aspects of the program, says Heller, a professor of pathology and laboratory medicine at NJMS, was that by the end of the event every woman was provided with her results and, where necessary, given follow-up appointments. This is a critical component of the program, explains the CAP member, because it “means that you can immediately get a patient who may not have been screened for years, if ever, into the system in case they need additional care.”

In addition to the screenings, numerous booths— or what Campbell-Oparaji called “pitstops”— were set up to offer participants with health education information while they waited for their results.

As one might imagine, such an undertaking requires a great deal of support to pull off. That support came from a cadre of more than 40 volunteers, who—in addition to New Jersey Medical School faculty, staff, and students— included patient navigators from University Hospital who helped arrange follow-up appointments for those needing them; pathology residents who conducted seminars on Pap tests; students from Rutgers School of Dental Medicine who provided free oral screenings; students from Rutgers School of Health Professions who counseled attendees on healthy eating habits; and a certified smoking cessation counselor. Other “pitstops” included booths staffed by the American Cancer Society, Susan G. Komen Foundation—North Jersey, the New Jersey Commission for the Blind; Essex County Family Justice Center, and the Partnership for Maternal & Child Health of Northern New Jersey, among others.

Having already applied for another CAP grant for next year, the organizers hope to make See, Test & Treat an annual occurrence. For Heller, this kind of outreach all boils down to one thing: “If we have identified even one woman and prevented one case of cervical cancer then we’ve done a wonderful thing for patients.”
In every recipe for success, there is a mix of ingredients. At Matheny Medical and Educational Center, a special hospital and school for the developmentally disabled, two NJMS alums are right in that mix, perfect together...again. This isn't the first time Matheny's chief executive officer Kendell Sprott, MD, JD, and chief medical officer Vincent Barba, MD, have worked side by side. But for the past “two years and two months, and who's counting?” Barba laughs, they have clearly relished the task of making Matheny “a high reliability organization that delivers exceptionally safe, quality care to every patient, every day. Here, we see a problem, we fix the problem,” says Barba, who is also vice president for patient care and safety.

The drive from Newark to the grassy, tree-filled hilltop in rural Peapack and the Matheny complex that serves individuals with autism, blindness, brain injury, cerebral palsy, Down syndrome, intellectual/cognitive disabilities, psychiatric/mood disorders, speech/apraxia and substance abuse, is not that far. But when Sprott arrived three years ago, he was in a new world. “I had spent almost all of my career in Newark: my medical education, my pediatric residency,” working at Beth Israel Hospital, United Hospitals, Children’s Hospital of New Jersey, teaching at NJMS, chairing the pediatrics department, as chief of service at University Hospital (UH) and on the integration team merging with Rutgers. Sprott has a medical, clinical, educational and financial background but is also a lawyer with hands-on governmental and social service agency ties. For him, Matheny “was an opportunity that presented itself where I would have the ability to make decisions and get things done. That journey you take is extremely important,” he emphasizes. “And all that I had gone through in Newark was extremely helpful in dealing with the practical issues here.”

With a preschool, middle school, high school, unique art program, a special hospital for acute and long-term care as well as five group homes, transportation services, and transitional programs for clients ranging in age from 3 to 71, Matheny was a puzzle Sprott was uniquely qualified to solve. “You need to understand how something works, whether it’s a body, the organs within that body, or an organization,” he says. “The best thing about this place is the clientele we serve. Our patients are very special individuals, the most medically complex of the developmentally disabled, and on ventilators, feeding tubes, urostomies, and prone to respiratory and skin infections. Two-thirds don’t have family support so our staff, very dedicated and caring, becomes like family.”

But after his first winter and spring, seven months into the new job, as he faced tough financial issues; a joint commission accreditation challenge; concerns about patient care; with no logical infrastructure or organizational chain of command to pull it all together, Sprott says, “I called Vinnie and said, ‘I need help.’”

The two men first met when Barba was a third-year medical student and Sprott was his teacher. Their ability to work well together became apparent later while collaborating on NJMS management and administrative teams. Both men are still on the NJMS faculty. “When I became an educator at the medical school 18 years ago,” Barba says, “I even adopted Kenny’s Socratic method of teaching. He has an incredible fund of

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Kendell Sprott, MD, JD (left), and Vincent Barba, MD
Battling Lymphedema

This NJMS alumna’s mission is to improve quality of lives and raise awareness. **BY GENENE W. MORRIS**

Up to 10 million Americans, and hundreds of millions worldwide, suffer from lymphedema and lymphatic diseases. In fact, more people experience these conditions in the U.S. than those living with multiple sclerosis, muscular dystrophy, ALS, Parkinson’s disease and AIDS combined.

And yet, says NJMS alumna Kathleen Francis, MD, few doctors recognize lymphedema, much less know how to treat it. “I would say, in the entire country, there are probably 25 to 30 physicians whom I would consider experts in lymphedema,” she estimates. Luckily for Garden State residents, Francis is one of them.

For nearly 25 years, the widely respected lymphedema physician has devoted her entire practice to caring for patients grappling with this oft-overlooked illness. “The fact is these patients are so unlooked-after in the general medical world,” Francis says, marveling at how frequently the condition is labeled as something else or dismissed as just a case of swelling. But there’s more to the chronic disease than that.

Lymphedema occurs when protein-rich fluid collects in the tissue beneath the skin causing edema. The disease usually develops when lymph vessels are damaged or lymph nodes are removed. In Francis’s Livingston, NJ, practice “maybe 20 to 25 percent of my patients have cancer-related lymphedema. For the rest, the lymphedema, typically, has no identifiable cause except obesity and sometimes repeated infections.”

Francis points out that while there is no cure for the disease, many patients respond well to what she calls the “gold standard” in lymphedema treatment: complete decongestive therapy. “It basically involves a type of lymphatic massage, short stretch bandaging, really attentive skin care to reduce skin problems, and leg or arm exercises to help facilitate lymphatic pumping,” Francis says.

The key, Francis says, is to catch the disease early because “as the lymphedema becomes more severe, people can get really bad skin ulcerations and leaking of water out of their legs. These terrible skin changes can make the skin hard, bumpy, red, dry and crusty. It can be enormously disfiguring.”

Trained as a physiatrist, Francis credits a phone call some 24 years ago from the medical director of the Cancer Center at Saint Barnabas, Richard Michaelson, MD, with changing the course of her career. Having just completed her residency in Physical Medicine and Rehabilitation at NJMS/Kessler Institute for Rehabilitation, she was working for Kessler when Michaelson called her department and said, “Why are we sending our breast cancer patients with arm lymphedema to New York? Why can’t we treat them here?” From there, she says, “I got together with the rehabilitation department and we initiated a program of lymphedema treatment,” making it one of the first such therapy departments in New Jersey.

“I started seeing patients pretty much right off the bat without knowing very much about lymphedema at that point. I went to conferences and I got involved in education,” she says. Today, Francis serves as medical director of the Saint Barnabas Lymphedema Treatment Center. She was also a member of the National Lymphedema Network Medical Advisory Board for many years and is the medical director of Klose Training and Consulting, a training course for lymphedema therapists. Her work in the field has garnered her the respect of peers, the admiration of patients, and numerous awards and accolades. In fact, on March 6, 2017, or World Lymphedema Day, Francis was honored with a Joint Legislative Resolution from the New Jersey State Senate and General Assembly acknowledging her “outstanding advocacy of lymphedema awareness, research and education.”

It was a huge honor that, 30 years ago, the former stay-at-home mom would have never envisioned: “I was 35 and had three children when I went to medical school.” It had been a long-held dream of hers when Francis’s husband, Sam, encouraged her to pursue that ambition. “Neither one of us was very confident it would happen,” she says, chuckling. “But it did happen, thanks to NJMS, she says. “They took a chance on me.”

Now in her practice where Sam serves as office manager, Francis offers patients a chance at an improved quality of life. She hopes her efforts will inspire other doctors to become more knowledgeable about lymphedema. “If we have more awareness and more treatment, it’s great for patients.”

“We need more clinicians who look for lymphedema, diagnose it, and know how to treat it, or who, at least, know how to send people for appropriate treatment.”

KATHLEEN FRANCIS, MD’89

**PULSE** FALL 2017

KEITH B. BRATCHER, JR.
Guiding ‘Shining Stars’ at NJMS

BY MARY ANN LITTELL

“I have one of the best jobs in the world: working with our students and being involved with community outreach,” says Tanya Norment. “Whenever the students come up with an idea for a project — some way to help others — the answer is always yes.”

As program administrator for the NJMS Healthcare Foundation Center for Humanism in Medicine, Norment cherishes her close ties with the students, calling them “our shining stars. They’re so special, all of them.” She mentors the humanism fellows — a few are selected from each incoming class — and always seeks opportunities for students to engage their communities. The Humanism Center promotes the human dimension of medicine: respect and kindness in the delivery of care.

People who work behind the scenes don’t always get the recognition they deserve. But recognition came knocking at Norment’s door last spring when she received Rutgers University’s 2017 Clement A. Price Human Dignity Award “for her tremendous commitment to NJMS students, her dedication to community service, and her efforts in advancing the work of the Center for Humanism.” Norment is the second recipient of the award, named for the legendary Rutgers professor and historian who had a lifelong love affair with the city of Newark—a love Norment shares.

“I was honored to receive this award,” she says. “I had the opportunity to meet Clement Price many years ago when he visited here. He was an inspiration. He always said yes too — anytime you asked him, he’d come to NJMS and speak to the students.” The award included a cash prize that Norment donated to the Student Family Health Care Clinic. “It was nice to be able to pay it forward.”

“Tanya has a gift for bringing people together…She offers meaningful experiences that make students gravitate to her. It’s no small feat in the age of cellphones, Facebook and Twitter.”

— DORIAN WILSON, MD

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“I have a certain passion for poisonous plants,” says Lewis Nelson, MD, who joined NJMS last year as the inaugural chair of the Department of Emergency Medicine and chief of service in the Emergency Department at University Hospital. “That probably isn’t really surprising, given that I’m also a toxicologist.”

Passion might be putting it mildly: Nelson has not only co-authored a book on the subject—“The Handbook of Poisonous and Injurious Plants”—he’s even grown a few specimens in his backyard. “It’s not like it’s cocaine or marijuana,” he says, laughing. “It’s nothing I can’t talk about. I’ve grown foxglove, monkshood, jimsonweed. Crocuses, castor beans. They’re all relatively easy to grow, as long as you’re in the right climate.”

Nelson grew up on Long Island and in Queens, the son of an orthopedist father and a schoolteacher mother turned homemaker. “Growing up in a medical family, medicine sort of seemed like the path I was supposed to take,” he says. “I never really thought about doing anything else.”

After obtaining his undergraduate degree at Emory University in Atlanta, Nelson returned to New York for medical school at SUNY Health Sciences Center in Brooklyn. “I started out planning to go into surgery, but during my surgical internship I spent some time in the emergency department and I really liked it. I decided it was probably a better career for me. After my internship year, I opted to switch to emergency medicine.”

After completing his residency at Mount Sinai, Nelson did a fellowship in medical toxicology at New York University. “I spent more than twenty years at NYU,” Nelson says. “I was vice chair of emergency medicine, I ran the medical toxicology fellowship program, and I was an editor of the primary textbook of human poisoning. But I felt that this job at NJMS was the right job for me. NJMS is an impressive institution and I really appreciate the talented and committed people I get to work with.”

Nelson is board-certified in emergency medicine, medical toxicology, and addiction.
medicine. “My particular area of expertise is pain management and the adverse consequences of opioid use,” he says. “Many people who are currently addicted to or abusing opioids started out by getting a prescription from a health care provider. There are many reasons why the opioid epidemic has occurred, but a large part of it is the somewhat irrational expectations for the management of pain by both doctors and patients. If you have an injury, it’s going to hurt and that is normal. I think the idea that you ‘have to’ give a patient a pain-free recovery leads some doctors to prescribe more opioids than they probably should. Although opioids are fairly effective in the short term, there are some risks. They are not effective for long-term use, and they carry tremendous personal and societal risks.”

One of Nelson’s favorite things about emergency medicine is that “every day is different. There is a tremendous variety of experiences.” He adds that emergency physicians “have a very wide range of knowledge and expertise, so we know enough about anything to diagnose and manage every patient, regardless of their underlying illness or injury.”

Nelson says he’s proud to have joined the NJMS community. “Residents who complete our program are fully prepared to provide emergency care in any setting,” he says, “and we have an outstanding group of faculty skilled in every subspecialty of emergency medicine. It’s our mission to be both a steward of academic medicine and a provider of health care for the greater Newark area. That’s important, I think.”

“I spent many years at NYU. But I felt that this job at NJMS was right for me. NJMS is an impressive institution, and I really appreciate the talented and committed people I get to work with.”

Together Again
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knowledge and the ability to boil down a problem into digestible bits. He knows how to ask the right questions, to work through the list of problems. That’s a lot of what he does here today as CEO.”

As an internist, Barba has a lot of clinical management and administrative expertise. “I grew up in my career in hospital administration, an area that some physicians call ‘the dark side,’” he jokes. Everything from personnel leadership to finance, risk management and quality improvement are in Barba’s bag of tools. Sprott says, “His knowledge, experience, expertise and manner were things I knew would be valuable here.” All Matheny medical staff, from the doctors to nurses, aides, therapists and social workers, report to Barba. “This is a very different patient population but with just as many needs as the acute care I gave to the poorest of the poor in Newark,” he explains.

“So have you figured this place out yet?” Barba asks his boss.

“It’s like peeling an onion,” Sprott laughs. Together they have. Matheny passed its joint commission accreditation test with flying colors, “probably the best I’ve ever gone through,” Barba admits. Then, because their financial picture depends upon insurance and governmental funding, the Centers for Medicare and Medicaid Services (CMS) required additional, rigorous validation of everything that happens at Matheny.

The next step is to take what they’ve done at Matheny and share it with government, state and private agencies for the developmentally disabled. “Medicine is no longer based on a simple fee for service. You need data to demonstrate that you are providing a valuable service,” Sprott explains, in order to be reimbursed. “You have to document what you are doing for patient safety and quality of care,” he explains. If this duo can show others how this works, “it would be an extremely important legacy.”

Guiding NJMS
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“Tanya has a gift for bringing people together—whether it’s in her travels to Newark public schools, her interaction with the pipeline students attending summer programs at NJMS, or her extraordinarily unselfish interactions with the medical students,” says Wilson. “She offers meaningful experiences that make students gravitate to her. It’s no small feat in the age of cellphones, Facebook and Twitter.”

“I have a special bond with the students,” admits Norment. “I think it’s because I listen. Sometimes they just need that. I understand what they’re going through, what they’re feeling.” These bonds bring students back to visit her. “They pop in all the time,” she adds. “I go to weddings, christenings, and birthday parties. I feel like I’ve affected a lot of young lives.”
PARTNERS IN CARE

University Hospital’s new president and chief executive officer, John N. Kastanis, MBA, FACHE, has a bold vision to transform UH into northern New Jersey’s premier academic medical center. To pull off, it will take the collective efforts of all stakeholders, including its long-time partner in care, Rutgers New Jersey Medical School.

BY GENENE W. MORRIS

For almost a half-century, NJMS and UH have worked together as sentinels, of sorts, guarding the health of all who dwell in and around the city by treating maladies, curing illnesses, and surveilling potential threats to the well-being of the region’s citizens. A partnership born of a shared commitment to providing high-quality clinical care, conducting cutting-edge research, serving the community and training future generations of physicians, their alliance has rendered both institutions powerhouses in health care and education.

NJMS dean Robert L. Johnson, MD, ’72, remembers fondly this union’s early days. A first-year student in 1968, Johnson was present when NJMS assumed operation of Newark City Hospital, eventually renaming it University Hospital. And although UH is now an independent, standalone medical center, that partnership persists with NJMS supplying most of UH’s medical staff and UH serving as the school’s primary teaching hospital, providing invaluable hands-on training for students and residents.

“I have been around the hospital for many, many years,” says Johnson who now serves on the hospital’s Board of Directors. “I’ve seen it develop… I’ve seen it evolve.”

That ability to “evolve” has been central to the hospital’s survival, especially during the unprecedented changes in health care in recent years.

That’s where Kastanis comes in. This highly accomplished executive is a game-changer, recognized for his work with other safety-net hospitals and ability to steer them toward national prominence. With similar ambitions for UH, he says, “Since my appointment last year, I have had two areas of focus: leading the financial, operational, and clinical aspects of the hospital and advancing the regional health care needs of the city of Newark, Essex County, and beyond.”

Toward that end, Kastanis and his leadership team have undertaken several initiatives designed to make this vision a reality, firmly establishing UH as a nationally recognized destination where doctors treat, patients heal, scientists explore, and future generations of health care professionals train and become proficient.

From recruiting outstanding talent or helping units make sound decisions, to embarking on a “Graduate to University Hospital. Smart Hospital. Smart Choice” advertising campaign, these leaders are resolute in their commitment to implementing programs that will make UH more competitive in health care’s ever-changing field.

One such initiative involves the modernization of UH’s labor and delivery suites as well as its lobby. In fact, Kastanis and Johnson helped to unveil the newly renovated lobby at a ribbon-cutting ceremony in August. More than a facelift, the lobby is a declaration to visitors and...
patients that, says Kastanis, “they’ve arrived at a facility that is welcoming and warm.” Featuring new furniture and flat-screen televisions, the lobby also houses Patient Information and Guest Relations centers, where visitors can get assistance with things like wayfinding, faxing, or even calling a taxi.

The lobby project is one of many initiatives overseen by UH’s first-ever chief experience officer, Joan Dauhajre, LCSW, MS, who was recruited to start the Patient Experience Office as a way of improving “the patient experience at every level,” says Kastanis. “Whether it’s how we answer the phone or serve a lunch tray, we’re really listening to our patients.”

Since joining UH’s administration, Dauhajre has, among other things: introduced the staff and faculty to best practices that positively shape patient experience; rolled out new uniforms that help visitors easily identify each employee’s role; initiated an At-Your-Service internship program for college students who plan to work in health care; and developed the hospital’s Healthcare Chaplaincy program, complete with a brand new chapel. She is also working with different units to improve scores by Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), a survey measuring patients’ perspectives on hospital care.

To improve patient experience, Dauhajre and other Executive Leadership Group (ELG) members place great emphasis on employee communications and on creating an environment where employees have a voice. Which is why, on the third Monday of every month, through a program called ELG Rounding, members of the executive team disperse throughout UH in search of employees. Working in pairs, the administrators—including Kastanis—round the floors before settling at different worksites and politely requesting a moment of employees’ time.

While conversing, these executives don’t shrink from complaints or sugarcoat concerns. On the contrary. They encourage them, recognizing that to achieve national prominence, UH’s more than 3,500 employees are hospital ambassadors whose opinions matter.

“Those rounds are about connecting the C-Suite and senior leadership with our staff, with their needs, with their vision,” says Dauhajre. “They’re the eyes and ears of the institution. So, it behooves us to listen to them.”

Of course, at the heart of UH is its mission to “improve the quality of life for all those we touch through excellence in patient care, education, research and community service.”

One of three Level 1 Trauma Centers in the state—and the only one in northern New Jersey—it is home to the Center for Liver Diseases and a Comprehensive Stroke Center. It has tertiary and quaternary services and provides inpatient and outpatient services at five locations. With 690 medical and adjunct physicians on its staff and 616 residents, the 519-acute-care-bed hospital, in fiscal year 2016, saw more than 90,000 emergency department visits and 172,000 outpatient visits. Furthermore, it conducted 14,000 surgical procedures and provided 109,000 Newark EMS and 411 NorthStar responses.

In another exciting initiative, UH will soon be the site of a new Vascular and Wound Care Center. When it opens next year, says
Michael Curi, MD, MPA, an associate professor of surgery and chief of the Division of Vascular Surgery at NJMS, it will represent one of the great advances at UH, providing both clinical care and research into novel therapies for vascular disease and chronic and complex wounds. “Our medical staff has many of the leaders in the treatment of complex pathology and University Hospital sees some of the most challenging cases in the state with patients who have significant comorbidities,” Curi notes.

In addition to his roles at NJMS, Curi is also president of UH’s medical staff, serving as a conduit between the faculty and the hospital’s administration. Each year, he and his wife help organize the University Hospital Golf Classic, an annual event that has raised more than $600,000 since its inception in 2012. Curi, who serves on the newly formed Foundation for University Hospital, says the medical staff is committed to working with the hospital “to achieve the kind of changes the hospital is undergoing as it transforms into a national leader in academic health care.”

Other major initiatives Kastanis notes as being key to UH’s transformation include:

- **Working with RWJBarnabas Health** to develop a Population Health Strategy for Newark and surrounding areas that, Kastanis says, would be “designed to improve access to health care and find the most effective ways to deliver it.”

- **Initiating the integration of the Doctors’ Office Center** with its Ambulatory Care Center, which will be rebranded as Rutgers Health at UH. “We’ll be consolidating about 190,000 outpatient visits into the ACC,” says chief administrative officer Annette Hastings, who oversees the project and the Population Health Strategy.

- **Partnering with Rutgers Cancer Institute of New Jersey** to bring to Newark an integrated cancer program that includes medical and radiation oncology, clinical trials, community outreach and education. The partnership makes UH part of the state’s only National Cancer Institute-designated Comprehensive Cancer Center.

Programs like these are paramount not only in caring for patients but in serving Newark’s residents. Over the years, the approximately 650,000 Newark residents—of whom 30 percent live under the U.S. poverty level and 25 percent are uninsured—have come to rely on the hospital for more than primary care. Working with more than 90 community partners, UH intends to meet their needs. “We’re extending our mission beyond the walls of University Hospital,” says Kastanis.
THE EUREKA! MOMENT arrived with $4 million. That financial vote of confidence, the largest in a series of grants, confirmed Pranela Rameshwar’s conviction that stem cell therapy will change the way we age. This professor of medicine recalls, “I said, ‘Wow, this is going to work.’ But honestly, we just knew this mechanism would work from our very first studies. What if we could live a healthy, productive life, not costing the health care system so much as we age? What if we could have better surveillance immune systems to deal with infection? What if we could reduce cancer and make vaccinations work better as we get older? And in terms of cancer, with the growth of all this immune therapy for treatment, wouldn’t it be better if the population of people being treated had better immune systems?”

Pranela Rameshwar, PhD, the girl from Georgetown, Guyana, who came to New Jersey by way of the University of Wisconsin, where she earned her BS in medical microbiology in 1985, is thinking big and for very good reasons. With hundreds of research publications to her credit, breakthrough discoveries aimed at saving lives, numerous awards, accolades and honors, worldwide liaisons in the stem cell community, and students who have grown up to become respected scientists, Rameshwar is not kidding when she says, “We hope to use this stem cell therapy as preventive care. And what is important to me is that it must be cost-effective. Everyone, rich or poor, should be able to get it. We want to send this technology to third world countries.”

The funding from Advanced Regen, a division of Black Beret Life Sciences, LLC, a biotechnology company with a focus on developing cellular therapeutics, totals “about $4.7 million,” according to Steven Greco, PhD, a research associate who earned his doctorate in 2007 under Rameshwar’s wing. “The first round of funding back in 2012 was $150,000 to cover proof of concept, and in late 2013, we received $450,000 to validate our results and perform animal safety studies.” By 2015, with compelling data, the lab was ready to expand the project and delve into what was happening at the cellular level in terms of aging and regeneration. That was Eureka! “With the big grant,” Greco explains, “we were able to purchase advanced equipment and bring on more staff.” Other Rutgers labs and the university itself are now benefitting from the discoveries and techniques of this team.

“Essentially, the crux of this entire project is that as we get older, starting in middle age, our immune system becomes less competent and as a result we develop age-related disorders and diseases,” Rameshwar says. This project, restoring the aging hematopoietic stem cells, and perhaps other stem cells in the bone marrow, using secreted factors from young stem cells, “can restore the immune system,” she explains. Her team has already proven that it works safely with in vivo models.

This remarkable woman is a lifelong research adventurer in the world of immunology, stem cells, cancer, and especially bone marrow. Look inside any bone marrow operation and you’ll find a veritable biological hive of human cellular activity. You can actually see this now with modern technology, but when she began her PhD in immunology at Rutgers, she simply followed her instincts to go straight to that bone marrow. “We didn’t even know then that all organs, not just bone marrow, have stem cells. But when I started studying stem cells, I soon realized they touch every single area of life. They really do.” While embryonic stem cells were once considered precious for their research potential, one of the more common areas to extract stem cells now is adipose, or fat, tissue. How things have changed.

Rameshwar believes she has “the smoking gun,” that piece of evidence clearly showing how something—in this case, aging—happens, as well as how to restore function to older hematopoietic and immune systems, making them better able to fight off cancer and infectious diseases.

Using young tissue to regenerate old tissue is not a brand-new idea. Scientists have been carrying out projects since the 1950s and 1960s and even further back, sometimes grafting young animals’ blood systems right onto old ones to prove their theses. But the time for legitimate regenerative medicine has now arrived. And like Rameshwar, researchers at Harvard, Stanford and the University of California at San Francisco have demonstrated recently that a young circulatory system contains restorative factors that can rejuvenate old tissue and cells. In Rameshwar’s lab, “We have developed an in vitro model that allows us to measure the effects of these factors in young blood cells on the function of aging cells.” By exposing the old to the unique mix of stem cells—hematopoietic stem cells (HSCs), HSC progenitors, mesenchymal stem cells (MSCs), endothelial progenitor cells (EPCs), and mature immune cells collected from the healthy young—Rameshwar boosts immune function and safely achieves a process she calls “cellular restoration.”

“We are not going to make people look like they are 16 years old,” she cautions. It has nothing to do with beauty at all. In fact, Greco points out, “This is modern science, not snake oil, which is what so much of the anti-aging field has been in the past.” Rameshwar agrees. “This is very important, very serious. Whatever life you live, let’s make it healthy and productive.”
The two doctors, father and son, sit across from each other talking about medical careers that can break even the coldest of hearts and make surgeons cry. Both are mildly reserved. Both are self-assured. Both are brilliant. One is experienced. One is not there yet. Neither come across as a hero but truly, they are heroic as they look across the table knowing what may lie ahead: children living, children dying. It’s up to them.

Michael P. LaQuaglia, MD, (Mike), is chief of pediatric surgery at Memorial Sloan Kettering Cancer Center (MSK) in New York and has been saving children’s lives for decades. “Taking care of critically ill kids,” he says — and often, the inoperable cases no one else will tackle — “is a very emotional thing. These kids...well, you get attached to them and when you lose them, it’s terrible.” He has wanted to kill himself the five times it’s happened in the past 30 years. His son, Michael LaQuaglia, MD (Michael), a fourth-year surgical resident at Albert Einstein Medical Center in New York, hopes to follow in those footsteps. He’ll be applying for his next two-year pediatric surgical residency but there are no guarantees he’ll get one of the 50 competitive spots available. You can sense both are nervous but hopeful about this next step. “I don’t know if there is a genetic component to this,” Michael admits. “I know children’s lives are high-stakes situations. It does make me wonder but I just know I want to do the same thing he does.” That he is his dad, of course.

“No, I wasn’t really groomed for this at all,” Michael explains.

Mike adds, “There were no other doctors in our family. Actually I’m the first in my family to go to college.”

All in the Family

Michael LaQuaglia, MD’76 & Michael LaQuaglia, MD’12

By Maryann Brinley
"I decided against full-time research after spending one post-college year studying neuroblastoma at the Children’s Hospital of Philadelphia," Michael explains. “I enjoyed working with the kids and was leaning towards medical school after. I like patients,” this son says. So does his father, who admits, “In our field, I always say that one of the greatest parts of the job is that you can play with your patients. Obviously, you are dealing with serious illness, but what stands out is the attachment to these kids.”

In May 2016, Mike was nudged, encouraged, or maybe even forced by his hospital’s marketing department to be interviewed by Brandon Stanton for Humans of New York (HONY). “I don’t know why they’re always asking me to do these kinds of things,” says this world-renowned pediatric cancer surgeon. “Do I really have to?” he remembers asking. Founder of the HONY website, Stanton is a gifted interviewer, Mike recalls: “Sitting with Brandon is really interesting. He’s able to elicit stuff from you that you normally wouldn’t share.”

The HONY story went viral. There he was, surgically masked, wearing scrubs, sharing deep, and yes, dark thoughts. “The worst thing that can happen is telling a parent that I’ve lost their kid…those parents trusted me with their child. It’s a sacred trust and the ultimate thing that can happen is telling a parent that I’ve lost their kid…those parents trusted me with their child. It’s a sacred trust and the ultimate decision I made. And every time I lose a child, I tell the parents: ‘I’d rather be dead than her.’ And I mean it. But I go to church every single day. And I think I’m going to see those kids in a better place someday. And I’m going to tell them that I’m sorry. And hopefully, they’ll say, ‘Forget it. Come on in.’” (For more of this interview, go to humansofnewyork.com/series.)

"I didn’t see the copy beforehand,” Mike says, “then, people were talking about it.” Thousands of responses, and still counting, from former patients, and especially grateful parents, recalled this doctor with awe and tenderness. Many posted pictures and intimate details, including how he carried their infant from the operating room out to them. “His tears will be forever etched into my memory, he truly got our pain,” one mother wrote. They remembered kindness and expertise in the face of difficult diagnoses of Wilms’ tumors, neuroblastoma, liver tumors, desmoplastic small round cell tumors, sarcomas, melanomas and thyroid tumors. “Even if nobody else wants to try, I will try,” he explains. Another parent wrote: “You are an angel—in and out of the operating room.”

When reminded of that last comment here at the kitchen table, Mike says, “Well, yes, that makes you feel good. My concept has always been that we are curing a lot of people. We don’t cure some and that’s more of my focus. It is always the focus. You remember the ones that got away.” No longer able to dodge media requests, he’s starring in an MSK ad now.

Surgeons, who are sometimes criticized for appearing heartless, are anything but, according to both Drs. LaQuaglia. “We may seem tough on the outside but when you’re a surgeon, you are like the captain of a ship, leading a team so everybody has to be moving ahead all the time, especially when things go south. You have to stay in control,” Mike explains. At the same time, his soft-touch approach reassures patients’ parents. There is nothing they have done to cause cancer which is a “very complex genetic story involving a lot of different things at different times.” It’s not the glass of wine during pregnancy, their neighborhood’s pollution index or their care. “Pediatric cancer is a very rare phenomenon. I tell them we are going to work as hard as we can to cure their child and they are probably only going to have to worry about paying for that child’s college education,” this father says.

Both doctors do a lot of listening on the job. As Michael explains, “All that classroom stuff can only prepare you so much. Bad news? You have to talk to the patient and it can be scary. You make sure you have enough time. You just can’t walk in and walk out.”

The LaQuaglias believe NJMS provided the best preparation possible. In 1976, Mike went on to an internship, residencies and fellowships at Mass General, spending more than 10 years in Boston, where he also taught at Harvard. “I was ahead of the curve when I first got there because of rigorous training. NJMS pushed me to study, and to get the technical experience to do good procedures. As a med student, I remember being on the trauma team, working on a liver in the middle of the night, putting in chest tubes, getting really great clinical exposure.” Mike met his wife, Joanne, a nurse, and their first son, Michael, and his sister were born while in Boston. In 1987, he joined MSK and has been chief since 1994. “My plan is to step down and get more involved in the research, especially the mathematical and bioinformatics side of it.” Standing on his feet for “the 12 hour surgeries is starting to become difficult.” He’s 67.

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Research Roundup

It’s been a banner year for research at NJMS. Researchers at the schools garnered significant funding from the National Institutes of Health (NIH) and other funding sources for their projects. In 2017, NIH grants climbed to their highest level in the school’s history. These awards promise to spur the development of laboratory findings into usable therapies, devices, and preventatives in record time.

Work Locally, Think Globally

Purnima Bhanot, PhD, associate professor of microbiology, biochemistry and molecular genetics and a member of i3D, was recently awarded two NIH grants totaling over $2.5 million to discover novel drugs to combat malaria. She will collaborate with colleagues at Rutgers School of Pharmacy and Montclair State University. The team will synthesize potent inhibitors of the protozoan parasite Plasmodium and test their ability to block infection of the liver by the parasite before damage occurs. In humans, Plasmodium first infects the liver.

Bhanot’s prior research also focused on the malaria parasite Plasmodium, which is transmitted to humans by mosquito bites. In recent years, the availability of more sophisticated technology has given rise to new research methods and models that have led to novel drug targets.

Malaria is estimated to kill almost 1 million people, many of them children, and infect another 500 million yearly. There is no vaccine against malaria, and current drugs are expensive and have significant side effects. Improving malaria prevention and finding new therapies for treatment are urgent needs.
Worms, Immunity, and Autoimmunity

Worms and their damaging effects on human health are finally getting their due. Unbeknownst to many, worms (also called helminths) are a major cause of deadly disease in the developing world.

George Yap, PhD, NJMS associate professor of medicine and a member of the Institute for Infectious and Inflammatory Diseases (i3D), and William Gause, PhD, NJMS senior associate dean for research, director of i3D, and professor of medicine, recently received a $3 million R01 grant to study how worms prevent vaccinations from bolstering the immune system.

When worms travel through tissues in the body, they damage the tissues. These damaged tissues release “danger signals” that can trigger immune responses. It’s extremely difficult to eliminate parasitic worms, Gause says. They’re rampant in areas where sanitation is poor and are thought to infect 1.5 billion people globally. While drugs to eliminate helminths are available, people are often re-infected after an infection clears; and over-treating populations for worm infections may lead to the development of drug-resistant strains.

The ultimate goal of this research is to discover how CD8 cells are impaired by worms and how to re-engineer vaccines to circumvent worm-damage.

Gause and George Hasko, PhD, NJMS professor of surgery and a member of i3D, are conducting a tandem study on worm infection. This second five-year, $3.2 million study will examine how the immune system actually detects the helminth infection, and then becomes activated to protect against the parasite while weakening the very immune components that protect humans against microbes, such as those causing TB.

The combined results of the two NIH-funded studies will provide scientific data on the role of these worms in damaging immunity. Parasitic worms likely also play a beneficial role in the human immune system. Scientists theorize that in areas of the world where hygiene is good, the immune system may not develop normally. They believe that without worms to attack it, the human immune system may turn on itself, causing allergies and autoimmune diseases.

Vitamin D Takes Center Stage Again

Vitamin D has long been the research-focus of Sylvia Christakos, PhD, professor of microbiology, biochemistry, and molecular biology and a member of i3D, who has attracted more than three decades of uninterrupted NIH funding for her work focusing on the mechanisms by which inadequate vitamin D contributes to osteoporosis and possibly to cancer, immunity, and autoimmune diseases. Now Christakos is taking her research in a slightly different direction.

In July 2017, she and Michael Verzi, PhD, from the Department of Genetics, Rutgers-New Brunswick, were awarded an NIH grant to study the nutrigenomics of intestinal vitamin D action. They will use a genomic approach, coupled to physiology studies in novel mouse models, to test their hypothesis that both the proximal and distal segments of the intestine have unique regulatory pathways controlling vitamin D receptor expression and vitamin D action.

Christakos says the most important function of vitamin D is the regulation of intestinal calcium absorption, which is critical for bone health. While most calcium absorption research has focused on the proximal small intestine, preliminary data from her lab reveal an essential role for VDR (a gene that ultimately allows the body to respond appropriately to vitamin D) in the distal intestine.

She hopes their findings will reveal new approaches to prevent bone loss due to faulty calcium absorption for those at high risk, including gastric bypass patients, those with small intestinal resections, post-menopausal women, and older adults.
that various types of dendritic cells play in activating the immune response. There are many types of dendritic cells and they activate a range of different immune cells. Understanding how these different types of cells function is thought to be critical to delineating how the body responds to pathogens and to greater insight into the causes of various skin diseases, including autoimmune diseases.

In July 2017, Kumamoto was awarded an RO1 grant from the NIH/National Institute of Allergy and Infectious Diseases for his research into dendritic cells.

Launch of New TB Test Backed by WHO Recommendation

Molecular diagnostics company Cepheid, NJMS, and the nonprofit FIND launched a new version of the Xpert MTB/RIF test—called the Xpert® MTB/RIF Ultra (Ultra)—for the diagnosis of TB and rifampicin resistance. The World Health Organization (WHO) issued a recommendation that Ultra can be used as an alternative to the currently used Xpert MTB/RIF test for the diagnosis of TB and detection of rifampicin resistance.

TB killed 1.8 million people in 2015 and caused TB disease in 10.4 million. An estimated 580,000 TB patients were also resistant to rifampicin, a first-line TB drug. However, less than 70 percent of new TB cases and only 25 percent of drug-resistant cases were diagnosed or treated in 2015.

The WHO evaluation concluded that the new Ultra test performed better than the prior test in detecting TB in difficult-to-diagnose and vulnerable populations, such as children and people living with HIV. The Ultra assay was redesigned to boost analytical sensitivity more than tenfold and to improve the reliability of detecting mutations associated with rifampin resistance.

Research News at NJMS

William Gause, PhD, senior associate dean for research, authored an article recently published in Science, entitled Helminth infection promotes colonization resistance via type 2 immunity.

Mark Siracusa, PhD, assistant professor of medicine and a member of i3D, authored an article recently published in the Journal of Experimental Medicine, entitled Carbonic anhydrase enzymes regulate mast cell-mediated inflammation.

Selvakumar Subbian, PhD, assistant professor of medicine at the Public Health Research Institute received the “Young Investigator Award” for 2017 from the Theobald Smith Society, a branch of the American Society for Microbiology. His research focuses on human infectious diseases, particularly TB, using in vitro and animal models.

Teresa Wood, PhD, professor and Rena Warshow Endowed Chair in Multiple Sclerosis in the Department of Pharmacology, Physiology and Neuroscience, and Wendy Macklin, PhD, University of Colorado, were named winners of this year’s Senator Jacob Javits Awards in the Neurosciences, administered by the National Institute of Neurological Disorders and Stroke (NINDS). Wood’s research focuses on understanding signaling pathways regulating self-renewal, proliferation, and differentiation of epithelial stem and progenitor cell populations in the central nervous system, and also in mammary/breast tissue during development and related to disease.
About going to his dad’s alma mater, the younger LaQuaglia admits, “I was actually happy just to get in. I knew it would be a great experience and it was.” Michael also met his fiancée, Mary, that first year in Gross Anatomy though they didn’t share a cadaver. “We were in the same Physician’s Core group and bonded there.” Mary’s mother, Barbara Nahas, MD, is also an NJMS alum. Wedding plans are in the works for 2018 at the Newark Museum, where they hung out for the first time at the NJMS fall formal.

There is nothing funny about the worst day of your working life but both doctors laugh that as first-time residents, they questioned the sanity of their career paths the same time, just thirty-some years apart. Says Mike, “I was at Mass General’s Shriner’s Burn Institute, on my first rotation. It was Fourth of July, the bicentennial.” The only resident caring for many critically ill, severely burned children in their small suites, he recalls, “You had to put on all this stuff to go in and care for them. It was 2 a.m. and I had been working since 6 a.m. with no food. I’d had nothing to eat.” With the cafeteria too far and no one to cover, he finally grabbed a milkshake, gulped it and was soon gripped with diarrhea. He laughs now but remembers thinking, “Can I do this?”

Michael adds, “My first day of residency at Montefiore was the most abrupt transition ever. You go from having no responsibility in med school to covering a hospital floor. It was just a little traumatic.” He recalls…the chief of pediatric surgery performing a first time laparoscopic procedure in one suite…not yet having clearance to simply get scrubbed…running up flights to find environmental services for help…his residency chief in another OR…being late to surgery…being reamed out…being chastised for not monitoring a fever…and a full day of non-stop drama. At the end, a pediatric surgeon shared, “It’s not always like this.”

And that, he says, “calmed me down. I also thought of something my father told me that can help. The second day is always better.”

“We talk about these things and his career,” his dad says. “He wants pediatric surgery so it was important for him to do that research. We have talked about writing and presenting and learning and practicing his technical skills. Have an attitude of not being too crazy about things, not taking things too seriously, as well as the importance of taking time off.”

In truth, his dad knows the ropes and what comes next.
Dear alumni,

The Alumni Association’s Career Nights are one of the most enjoyable events of the year for both alumni and students. Career Nights provide an invaluable experience for second-year medical students, who have the opportunity to rotate through different specialties and engage with alumni in informal discussions. The Alumni Association hopes to expand on the success of this program. With input from both current students and the Office of Student Affairs, we have identified additional meaningful ways in which alumni and students can connect.

One way is through research opportunities. While many students are eager to perform research, there are not always enough opportunities at NJMS. Also, during their third and fourth years, many students would like to connect with recent graduates at places where they plan to participate in ‘away’ rotations or interview. These interactions can be quite helpful to the students as they begin the residency match process.

Additionally, students also benefit from supplementary career advisement: both general career advice and specialty-focused insight. The new ‘systems-based’ curriculum is in place at NJMS. Ideally, as students learn about each system, the school tries to arrange for a panel of doctors with specialties relating to that particular system to speak with the students. There are opportunities for physicians to serve on these panels.

If you are interested in any of these opportunities, please contact the Alumni Office at 973-972-6864 or email: njmsalum@njms.rutgers.edu. While this project is in the early stages, we hope to be able to make a difference and provide additional resources for the students.

Join the Alumni Association of New Jersey Medical School

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Visit njms.rutgers.edu/alumni, click on Alumni and Alumni Association and then Online Membership Payment to pay your membership online.

Alumni Association Hosts Awards Dinner

On September 9 the Alumni Association-NJMS Board of Trustees held its first awards dinner at the Green Brook Country Club in North Caldwell, NJ. Alumni board members, faculty, family and friends gathered to honor the awardees and enjoy performances by a talented student violinist and the NJMS a cappella ensemble, the Vocal Chords.

Chantal Brazeau, MD, interim chair of family medicine and professor of family medicine and psychiatry, received the Charles L. Brown Award. This award, named for the first dean of the medical school, recognizes an individual who has made outstanding contributions to NJMS. Brazeau, who is also director of medical student education, received a grant in 2011 that enabled her to expand the services of the NJMS Student Family Health Care Center to the Fairmount Shelter and the Apostle House in Newark.

Kenneth Klein, MD, professor of pathology and laboratory medicine, was presented with the Distinguished Professor Award, which recognizes outstanding teaching and dedication. He recently retired after nearly
40 years as a member of the faculty. During that time he has earned 31 Golden Apple awards and several achievement and teaching awards.

Marvin Rubinstein, MD, a cardiologist in Edison, NJ, is the recipient of the Honorary Alumnus Award. He will be honored at the Alumni Association Scholarship Awards Dinner on October 25.

Congratulations to all! ●

1960s
Thomas W. Kiernan, MD’67, is currently interim chief of gastroenterology/hepatology at the Medical College of Georgia.

Carl J. Minniti, Sr., MD’60, notes that his grandson, Carl J. Minniti, III, (son of Carl Minniti, Jr., MD) graduated cum laude from Rutgers Law School, earning a dual JD/MBA degree.

Leo M. Pisciulli, MD’60 continues to practice psychiatry at age 83.

Jose Luis Rementeria, MD’62, celebrated his 40th wedding anniversary in July 2017.

1970s
Robert L. Johnson, MD’72, NJMS dean and a 1964 graduate of New York’s White Plains (NY) High School, will be inducted into the high school’s Hall of Fame this fall.

William A. Rough, MD’74, retired on December 31, 2016 from private practice of vascular surgery.

1980s
Deborah K. Miller, MD’80, writes on medicine, health care issues and policy.

Evelyn Montalvo-Stanton, MD’81, is chief of the Division of Pediatric Pulmonology at Saint Barnabas Medical Center, NJ.

Sam C. Masarachia, MD’85, is six years retired from family medicine. He recently attended his 50th college reunion at the University of Chicago.

1990s
Rotem Friede, MD’97, writes that he enjoyed reconnecting with classmates at the Class of 1997 reunion.

Rosanne F. Giannuzzi, MD’93, practices with Montclair Anesthesia Associates, which now provides services at Newton Medical Center in Newton, NJ, in addition to many other locations.

2000s
Natasha R. Chinn, MD’05, was recently recognized by Continental Who’s Who as a 2017 Top Doctor in the NY/NJ metropolitan area. She is the medical director at Brescia and Migliaccio, MD, PC, in Hoboken, NJ.

Leigh Anne Daniels, MD’06, serves as co-director of the UNC Center for Bronchiectasis Care, Chapel Hill, NC. Her daughter Anna Leigh Lentz was born in 2016.

2010’s
Kevin J. Edwards, MD’11, was appointed director of the Emergency Department at Saint Michael’s Medical Center in Newark, NJ.

Revolutions for 250 Years
In honor of Rutgers’ 250th Anniversary, Lionel Corporation has produced a limited-edition, functional trolley motorized with bumper-controlled back-and-forth operation. Features include interior lighting, maintenance-free motor, traction tire, operating LED headlights, window silhouettes and two adjustable trolley poles on roof. The purchase supports NJMS student scholarships. To purchase the train, visit: http://250.rutgers.edu/shop.

Top: NJMS faculty members (standing, left to right): George Studzinski, MD, PhD; Kenneth Klein, MD; Seena Aisner, MD; Qing Wang, MD; Diana Castro, MD; Zarina Arutyunova, MD; and (seated) Robert Fede, MD.

Center, left to right: Paul Bolanowski, MD, Alumni Association president; Barry Maltzman, MD; Celeste Marchione Maltzman; and Mrs. Claire Bolanowski

Bottom: A special performance by the NJMS Vocal Chords (left to right): Maxine Chan, Thayer Mukherjee, Grace Ro (violinist), and Hoa Pham.
Still Strumming That Guitar

BY TY BALDWIN

“I’ve wanted to be a doctor ever since I was a child,” says Barry Wasserman, MD’92. “I grew up in Livingston, NJ, where Saint Barnabas is. I played soccer in high school and also volunteered at the hospital, trying to get some experience.”

It might seem odd, then, that Wasserman, a board-certified ophthalmologist with a practice in Princeton, who is also an associate professor at Sidney Kimmel Medical College at Thomas Jefferson University in Philadelphia, would refer to himself as an “epic fail.” He laughs and explains: “When it came time for college I didn’t apply to any schools north of Virginia because I hate winter. I went to Emory University in Atlanta, and from Georgia I was heading south to Florida. I swore that I would never end up in New Jersey.”

But he failed to stay away from his home state. The ties of family and familiarity pulled him back to New Jersey and to NJMS. And despite his youthful misgivings about the Garden State, Wasserman says NJMS was a wonderful experience. He graduated in the same class as his brother Mark.

“The class of 1992 had an amazing group of people who were very, very bonded,” he says. “We studied hard and we partied hard.” At his 25th class reunion this past June, Wasserman got a chance to relive some of his fond memories.

“I’m a guitar player,” he says. “In med school I made my pocket money by going to New York City and playing acoustic sets at a bar in the Village called the Red Lion. I planned my gigs around tests. They were on Monday, so you could study all weekend. We’d have a test in the morning, and I’d have a gig that night. So on Monday night when the Red Lion was completely dead, 150 med students would come in and the place would be rocking. It became kind of a bonding thing for our class, and that’s why, twenty-five years later, we had our med school reunion at the Red Lion, and I played.”

While his repertoire varies along the lines of classic rock and roll, Wasserman says that he always plays “Sweet Melissa” because his wife is named Melissa.

After med school and residency at NJMS, Wasserman did a fellowship in pediatric ophthalmology at Indiana University Medical Center. Today, he says, his practice “is split in two. I’m fellowship trained and often work with children and adults who have strabismus, misaligned eyes. So I uncross cross-eyed children. That’s super rewarding. I do ROP work at Cooper University Hospital, in Camden, at St. Peters University Hospital, in New Brunswick, and University Medical Center of Princeton. I run all over the state!” he says.

All in all, Wasserman says that life in New Jersey hasn’t turned out badly. “I’ve got a lot to be thankful for,” he adds. “A great wife, four great kids, and I get a lot of joy and a lot of reward out of my work. Twenty years in, I feel incredibly privileged to do eye surgery for a living.”

He’s still playing music too: following his performance at the 25th reunion, the managers at Red Lion invited him back to play in October. “Reliving those memories again,” he says with a smile.
Class of 2021 Celebrates White Coat Day

The White Coat Ceremony is a cherished rite of passage for first-year students nationwide who are entering a career dedicated to service, healing and research. On August 10, 178 incoming students at NJMS donned their white coats in the presence of family, friends, and faculty.

As they do every year, the students read the Hippocratic Oath in unison, symbolically taking the first step in their medical education.
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