

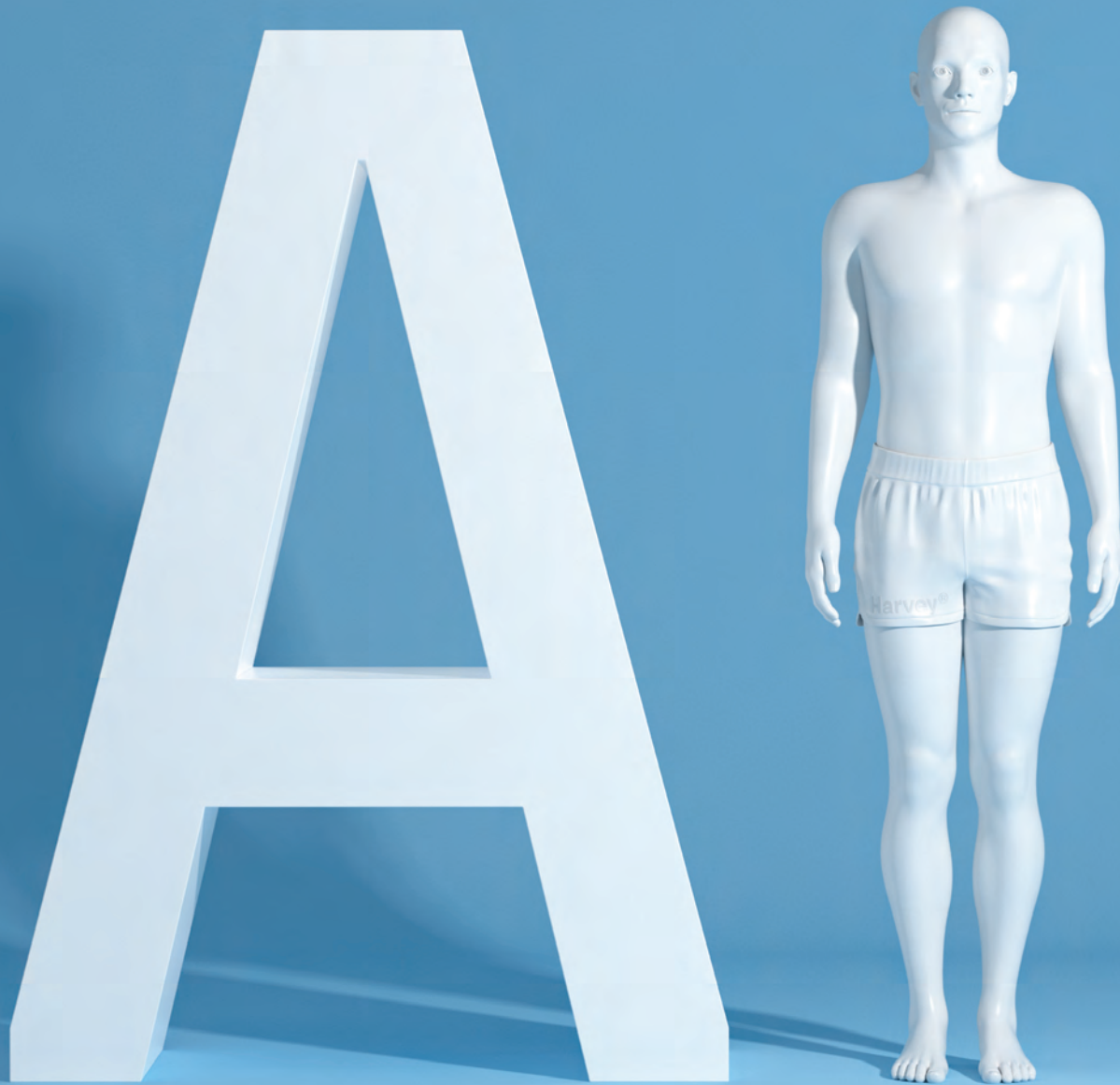
Inside: Kenneth C. Griffin's TRANSFORMATIONAL GIFT

UNIVERSITY OF MIAMI

Medicine

THE MAGAZINE OF THE LEONARD M. MILLER SCHOOL OF MEDICINE

SPRING 2024



SIMULATION GETS SMARTER

AI opens a new chapter in the Gordon Center's
medical training and education programs



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A Transformational GIFT

BUSINESS LEADER AND PHILANTHROPIST KENNETH C. GRIFFIN'S \$50 MILLION DONATION WILL ACCELERATE SYLVESTER'S CANCER RESEARCH IN A BUILDING THAT WILL BEAR HIS NAME

By ROBERT C. JONES JR.

From diagnosis and treatment to remission and recovery, the race to cure cancer has been a marathon, not a sprint — one filled with successes and setbacks, challenges and achievements.

Now, a landmark donation from a billionaire philanthropist to the only National Cancer Institute-designated cancer center in South Florida promises to quicken the pace in the race to defeat the disease.

Kenneth C. Griffin's \$50 million naming gift to Sylvester Comprehensive Cancer Center to fund the Transformational Cancer Research Building will allow the new 12-story, 244,000-square-foot facility on the medical campus to double its research footprint, accelerate efforts to develop new therapies, enhance care for patients and expand access to clinical trials.

In recognition of the gift, which is part of the University's \$2.5 billion Ever Brighter fundraising campaign, the facility will be named the Kenneth C. Griffin Cancer Research Building.

"Transformative" and "catalytic" are the words Stephen D. Nimer, M.D., director of Sylvester, Oscar de la Renta Endowed Chair in Cancer Research and executive dean for research at the Miller School, used to describe the gift.

"This gift is trajectory changing," Dr. Nimer said. "Ken Griffin has an incredible history of high-impact and effective giving. This naming will show the world that we are a luminary institution, worthy of incredible investment. It will help in our mission immensely and will also help us raise even more funds for important, lifesaving cancer research. Sylvester's outstanding researchers and clinicians are devoted to finding cures for cancer, and we have already made important strides. Powered by Ken's generosity and belief in us, our future is bright."

Griffin is the founder and CEO of the multinational, Miami-based hedge fund firm Citadel and founder of Griffin Catalyst. One of the country's leading philanthropists, Griffin has long been committed to pushing the frontiers of science and medicine to drive progress and



Kenneth C. Griffin, shown above, has long been committed to pushing the frontiers of science and medicine to drive progress and improve lives.

improve lives. His \$50 million gift comes as Sylvester renews its NCI designation, which it achieved in 2019, becoming one of 72 cancer centers nationwide to hold the distinction.

"Sylvester's team of physicians, scientists and health care professionals plays a leading role in our community's efforts to defeat cancer," Griffin said. "I am honored to support the transformational work of these incredible individuals in discovering, developing and delivering lifesaving treatments to those affected by this disease in South Florida and beyond."

For Griffin Cancer Research Building giving opportunities, email jesse.rodriguez@miami.edu.

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UNIVERSITY OF MIAMI Medicine

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Kiko Ricote

Dean's Letter



A Year of Transformation

What a remarkable start to the year for our community! First and foremost, please join me in celebrating a transformative \$50 million donation from philanthropist and businessman Kenneth C. Griffin to Sylvester Comprehensive Cancer Center. See page 2 for more on how this gift will propel groundbreaking therapies and advance unparalleled care for those affected by cancer.

But I would be remiss not to express my deepest gratitude to other generous donors whose support sustains our mission and propels our initiatives forward. Turn to pages 35–39 for just a few of these stories. Their generosity improves the lives of countless individuals, and we are profoundly thankful for their commitment to our shared vision.

I am delighted to share that several of our departments surged in the 2023 Blue Ridge Institute for Medical Research rankings, which are based on National Institutes of Health funding. We remain Florida's No. 1 medical school for federal research grants, and seven of our programs are ranked among the top 25 nationally.

The Class of 2024 recently achieved a remarkable 100% placement rate in the residency placement process and will soon be joining top-tier programs here and across the country. This outcome is a testament to their commitment and hard work, as well as the unparalleled education they received as #MedCanes. Read more about their successes on page 15.

Finally, I want to take a moment to laud the achievements of our alumni, whose exemplary leadership and dedication to excellence inspire us all. We were delighted to see many of them at the recent Medical Alumni Weekend. Turn to page 44 to see photos.

There are countless other exciting developments taking place at the Miller School, and I urge you to delve into this edition of *University of Miami Medicine* to read about artificial intelligence and simulation technology, gene editing and so much more. Together, we are truly transforming the future of medicine. 

Henri R. Ford, M.D., M.H.A.
DEAN & CHIEF ACADEMIC OFFICER



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Checkup

IDEAS INTO ACTION AT THE MILLER SCHOOL OF MEDICINE

Frequent Flier

As its 104th president, Dean Ford represents the ACS around the globe

When Miller School Dean and Chief Academic Officer Henri R. Ford, M.D., M.H.A., became president of the American College of Surgeons last fall, he described it as "a tremendous privilege." He represents the ACS at international meetings and conferences, contributing to advocacy efforts, partnering with other chapters and representing the interests of surgeons at the state/province and local levels.

That means Dean Ford is spending a lot of his one-year term in the air as he works to maintain a cohesive and influential voice for the organization nationally and internationally. To date, his travels have taken him to the Philippines, Puerto Rico, Sierra Leone, Japan and Germany. He will attend multiple events in the Caribbean, Trinidad, Barbados, Jamaica, Antigua and the Bahamas – in July, Brazil in August and Canada in September.

With 87,000 members worldwide, the ACS is dedicated to improved care of surgical patients and safeguarding standards of care. Dean Ford has been an ACS Fellow since 1996 and actively involved in its activities. "The ACS has a rich history of inspiring quality and guiding generations of surgeons," he said. "I am honored to step into this role and continue our essential work." – Robert S. Benchley



Illustration by Jonathan Carlson

Glioma Gig Ends on a High Note

A patient's guitar-playing skills assisted neurosurgeons removing his brain tumor



Christian Nolen usually plays guitar on stage. But last December, the professional guitarist played songs from the alt-metal band Deftones while a neurosurgical team at Sylvester Comprehensive Cancer Center worked to remove a tumor from his brain.

Doctors put Nolen to sleep at the beginning of the open craniotomy. Then, he was awakened during a delicate part of the two-hour procedure — called an “awake” craniotomy — to play the guitar. This helped doctors evaluate and protect his manual dexterity while being as aggressive as possible in removing the tumor.

Ricardo Komotar, M.D., the Sylvester brain and tumor neurosurgeon leading the team, explained that Nolen had a tumor called a glioma in the right frontal lobe of his brain near the area that controls left-handed movement.

“Our plan going into the surgery was that he would be awake and playing the guitar while we were taking out the tumor,” Dr. Komotar said. “We’d be examining him to be sure we weren’t injuring the part that controls hand movement, and the testing of hand movement would be done by him playing the guitar.”

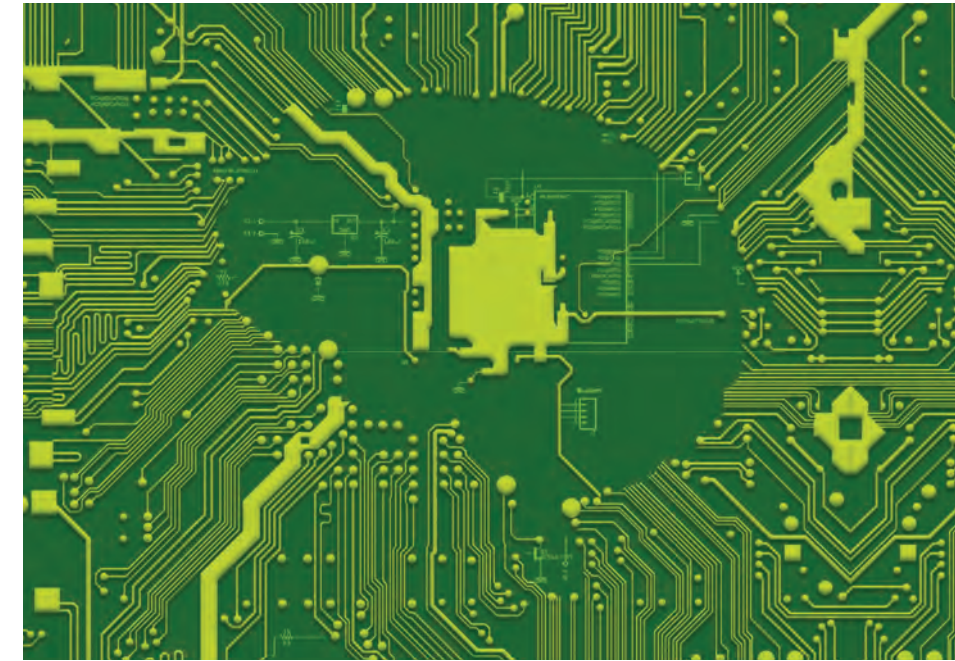
In an awake craniotomy, the patient is initially put to sleep, and regional anesthesia numbs the scalp for the invasive part of the operation, explained Arman Dagal, M.D., chief of Neuroanesthesiology and Perioperative Neurosciences at Sylvester, who provided Nolen’s anesthesiology care during the operation.

Nolen continues to undergo treatment, but he is playing guitar again — for fun, having passed his left-handed dexterity tests and ending 2023 on what might aptly be described as a high note. —Kevin McClanahan



Scan here to watch a video of the surgery.

Benedetto Cristofani



Exploring Brain Pathway Connections

A graduate student's platform aids in recovering cognitive health

When Olivia Osborne was 20, she lost her father, who was only 56, to glioblastoma. Her loss inspired her to study neuropathologies of the brain and find solutions to help families grappling with similar devastating diagnoses. The result? NeurOn, a platform that helps users regain control of their cognitive health.

“I think the brain is such a nexus of creativity, intelligence and beauty,” said Osborne, a fourth-year Ph.D. candidate in the Biochemistry and Molecular Biology program at the Miller School. “I want to protect this unique ability and teach others about it through my research and by exploring new avenues of therapeutic potential.”

While research remains a primary focus, Osborne is equally devoted to finding practical solutions for those experiencing neurodegenerative diseases.

“I decided to create an easy way to deliver cognitive exercises and aid in recovery efforts,” she said. “We are combining validated cognitive exercises with machine learning to

create a personalized and adaptable neurocognitive recovery platform.”

Osborne and her husband, Brett Colbert, an M.D./Ph.D. candidate at the Miller School, assembled a team of undergraduate computer science students from the University of Miami to code the NeurOn prototype. The enterprise secured funding by winning \$5,000 in the Jonathan Rothberg Catalyzer Award pitch competition.

NeurOn complements traditional medications. When patients open NeurOn, they undergo a cognitive assessment to predict where in the brain the injury occurred. Leveraging AI, Osborne and her team programmed NeurOn to tailor exercises to each patient’s needs, adapting based on performance.

NeurOn Therapeutics, the company she formed, aims to attract U.S. and international investors and forge strategic partnerships for marketing efforts. Version one is set to launch this year, and there is already a waitlist of interested participants. —Joey Garcia

Left: Raul Aria; Right: CLUTCH Content Partners

ONE TEAM, ONE FIGHT

Dolphins Challenge Cancer XIV has record-breaking participation and fundraising

For South Florida cancer survivors, family members and friends, the 14th annual Dolphins Challenge Cancer on February 24 at Hard Rock Stadium was a time to remember loved ones, celebrate personal victories and look forward to the future with hope.

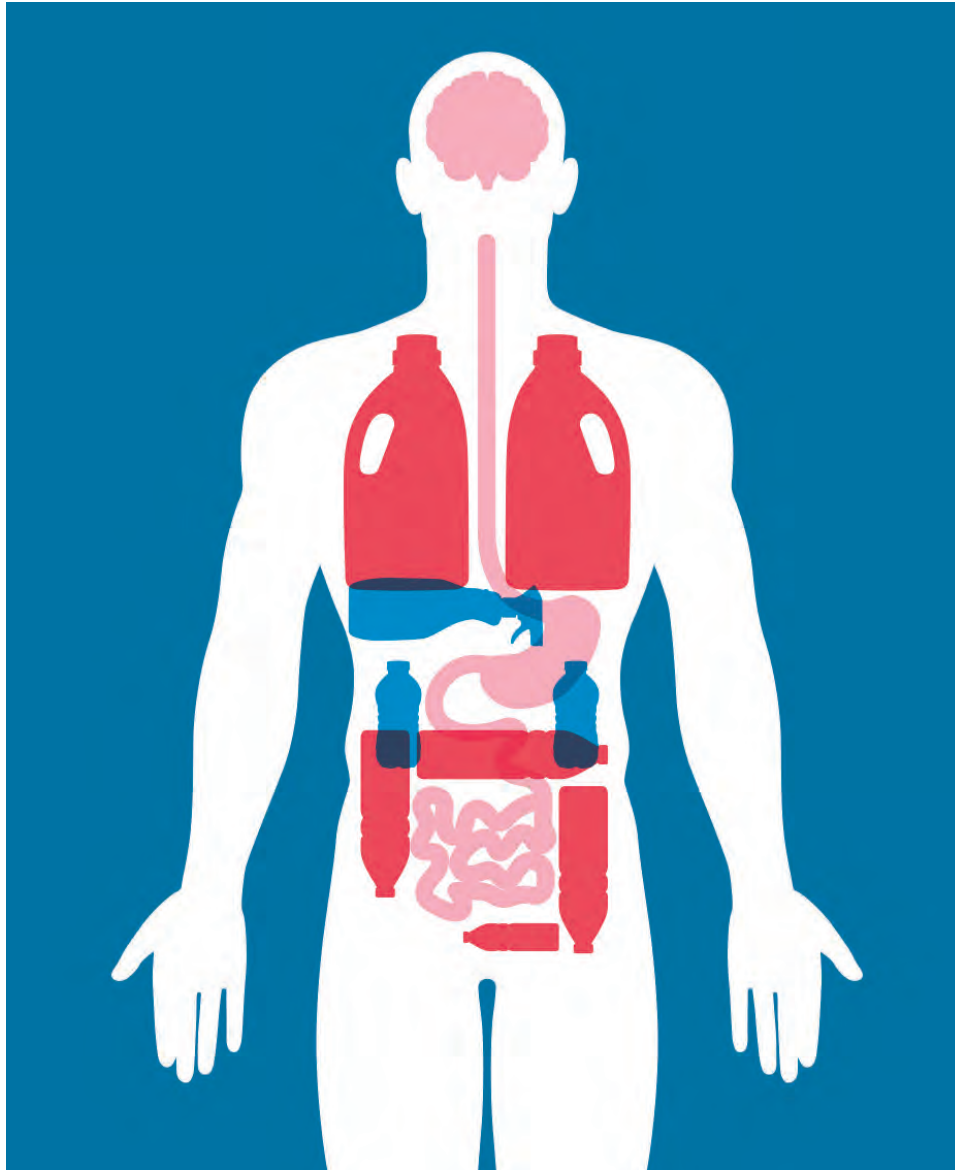
“We could not ask for a better teammate than the Miami Dolphins,” said Stephen D. Nimer, M.D., director of Sylvester Comprehensive Cancer Center. “Their dedication to supporting cancer research at Sylvester is unparalleled. Year after year, the funds that are raised by the DCC allow Sylvester to recruit and retain some of the world’s best minds in cancer research and provide them with the resources needed to make innovative discoveries and establish life-saving treatments, bringing us one step closer to a world without cancer.”

With the theme “One Team, One Fight,” DCC XIV broke last year’s record for the number of participants and surpassed the \$10.5 million raised in 2023. The final tally was 6,702 participants and more than \$12 million raised, fulfilling the program’s overall \$75 million commitment two years ahead of schedule. The Dolphins-led initiative is the NFL’s largest fundraising event, with 100% of the donations going to Sylvester. —Richard Westlund



TOP 25 NATIONAL RANKINGS

The Blue Ridge Institute for Medical Research ranked seven Miller School departments in the top 25 nationally for NIH funding in FFY 2023.



The Big Problem with Tiny Plastics

Neuroscientist David Davis’s research on the impact of plastics on cognition stars in an Emmy-winning documentary

In the PBS documentary *We’re All Plastic People Now*, scientists delve into the impact of plastics in the human body. While the environmental harm associated with plastic is no secret, scientists in the documentary

discussed outcomes related to the foods we eat, the water we drink and the air we breathe. Among the notable researchers featured in the film, which won a 2023 Suncoast Emmy and was accepted into the presti-

gious 2024 Santa Fe Film Festival, is David Davis, Ph.D., research assistant professor of neurology and associate director of the Brain Endowment Bank at the Miller School.

“Plastics are a growing public health concern because of their abundance in the environment and their ability to break down into smaller particles, increasing their toxicity,” Dr. Davis said. “We are on the cutting edge of knowledge regarding the effects of nanoplastics exposure on our cognition.”

At the Brain Endowment Bank, Dr. Davis and colleagues are investigating whether airborne plastic nanoparticles can enter the brain through the olfactory nerve, which spans from our nasal epithelium into regions of the brain involved in learning and memory. If particles can enter the nasal epithelium and gain access to this nerve, they can travel to and build up in the brain, causing toxicity. Damage to this nerve is one of the earliest signs of Alzheimer’s and Parkinson’s diseases.

“It is a great feeling to know the basic research we are doing in the Department of Neurology and in the Brain Endowment Bank will reach a broad audience,” Dr. Davis said. “This is one of the most critical environmental issues we face, and we urgently need a resolution. The bulk weight of plastics in our environment is increasing. Plastic debris can be found on mountaintops and in the deepest regions of the ocean, yet we know little about plastics and their impact on our health.”

The documentary presented testing results from blood samples showing an individual can have 80 or more plastic-related compounds circulating in their blood.

“Our goal is to see if the same holds true for the brain,” Dr. Davis said. “We selected well-characterized autopsy brain samples from healthy and cognitively impaired brain donors for similar testing. We anticipate publishing the findings from this research study later this year.” —*Joey Garcia*

Federico Gastaldi

Mission to the Middle East

A Miller School team traveled to Israel after the outbreak of the war with Hamas

At times, Enrique Ginzburg, M.D., looks more like a soldier than a surgeon. That’s because whenever the Miller School trauma doctor ventures into conflict areas as part of his role with a nonprofit to aid frontline physicians and medical personnel working in embattled countries, he often dons a flak jacket and helmet instead of scrubs.

But the doctor in Ginzburg is ever-present — such as the time late last year when he visited Israeli medics deployed near the front lines of the Israel-Hamas war, questioning them about what medical

supplies they needed most.

His brief visit there was part of a one-week mission to Israel to tour and assess the needs of a group of hospitals and trauma centers throughout the country, many of which have been treating a multitude of patients — both soldiers and civilians — who have been severely injured in the conflict.

“These are health care facilities where 40% of the health care personnel are Arab Israelis rendering care not only to Israelis but also to Arab Israelis, Druze and Palestinians. It’s a diverse patient population,” said



Brian Stauffer

Dr. Ginzburg, a professor of surgery who serves as the trauma medical director and chief of surgery at Jackson South Medical Center’s Ryder trauma unit.

He was part of a delegation of physicians that included Joseph D. Rosenblatt, M.D., professor of medicine and microbiology and immunology, and the William J. Harrington Chair in Hematology; Roy E. Weiss, M.D., Ph.D., professor and chair of the Department of Medicine and the Kathleen and Stanley Glaser Distinguished Chair in Medicine; and Pascal J. Goldschmidt, M.D., former dean of the Miller School who is now chief medical officer of Lennar, a Miami-based home-builder that, shortly after Hamas’s surprise attack on Israel on October 7, made a significant gift to Israeli health care facilities.

“We met the dedicated staff, which is uniquely diverse and includes Jews, Arabs and Druze,” Dr. Rosenblatt said. “The hospital’s leadership identified key areas for the University of Miami’s assistance, including the rotations of physicians and the development of their trauma center.”

In fact, a team of Miller School trauma physicians may soon begin volunteer rotations at Israeli hospitals, as officials have expressed the potential need for more critical care and burn specialists in response to the prolonged war and continued expansion of the conflict. The group includes Joyce I. Kaufman, M.D.; Howard M. Lieberman, M.D.; Mauricio Lynn, M.D.; Antonio C. Marttos Jr., M.D.; Brandon Parker, D.O.; Matthew Sussman, M.D.; Albert Varon, M.D.; and Barth Green, M.D., who is also executive dean for global health and community service.

Meanwhile, the first Miller School delegation has followed through on its promise to provide badly needed supplies to the area. Laparotomy trays and thoracotomy trays have been sent to Ziv Medical Center, a regional trauma hospital, and protective vests and helmets have been sent to medics serving in Gaza. —*Robert C. Jones Jr.*

Tumors in Disguise

To evade cancer, this brain cancer mimics neurons

Cancer cells are really good at playing dress-up. Tumors have developed many ways to evade being killed by drugs or detected by our immune systems by disguising themselves as different kinds of healthy cells. Incurable brain cancer glioblastoma, for example, can mimic human neurons, even growing axons and making active connections with healthy neurons in the brain.

Now, a new study from Sylvester Comprehensive Cancer Center and collaborating institutions has found that this neuron mimicry seems to be essential for the cancer's treatment resistance. The researchers also

identified a class of therapeutics, BRAF inhibitors, that could prevent the tumors' transition to drug resistance.

These findings were made possible by the researchers' unique approach to studying glioblastoma. The research team, co-led by Antonio Iavarone, M.D., deputy director of Sylvester and professor of neurological surgery and biochemistry and molecular biology at the Miller School, used a platform they designed to study glioblastoma cells' full set of proteins, also known as the proteome. The researchers looked for certain modifications on those proteins that indicate enzyme

activity in the cell.

"These platforms can provide you a landscape of alterations in individual tumors that you cannot get from genetics alone," Dr. Iavarone said.

The collaborative research team assembled what is now the largest dataset of its kind — matched tumor samples from 123 glioblastoma patients at the time of diagnosis and when their cancers recurred after initial therapy. By studying the tumors' proteomes and protein modifications in these samples, the researchers were able to spot important changes not previously seen in similar studies.

This study marks the first time that scientists have used proteomics to study how glioblastomas transition from treatable to treatment resistant. The researchers used their new dataset to identify therapies that could kill these resistant cancers. Looking at kinases — enzymes responsible for phosphorylating other proteins — the researchers used a machine-learning approach they'd previously developed to find the most active kinases in the neuron-like glioblastoma tumors.

One kinase popped to the top of their list: BRAF. The gene encoding for this kinase is commonly mutated in some cancers, including melanoma. But in glioblastoma, BRAF protein levels increase without corresponding changes in the gene. The team wouldn't have identified its importance in the brain cancer without looking at the cancer proteome. Now, Dr. Iavarone and his colleagues are in discussions to plan a clinical trial testing vemurafenib or another BRAF-inhibitor drug for glioblastoma. "Proteomics gives us a much more direct prediction of the proteins' activity," Dr. Iavarone said. "We hope that this type of analysis can be seamlessly translated into the clinic as a next-generation precision therapy approach for this very challenging disease and for other resistant cancers, as well." —*Rachel Tompa, Ph.D.*



Dan Page



The Envelopes, Please!

The Class of 2024 achieved a 100% placement rate on Match Day

Beneath the azure expanse of a quintessential Miami sky, 196 students from the Miller School's Class of 2024 learned where they will complete the next step in their medical training journey.

The Miller School has a history of an exceptional match rate, and this year was no different: The class earned a 100% placement rate on Match Day.

"We couldn't be more proud of all of you. The caliber of residency programs you will be entering is unprecedented," said Henri R.



See more from our Match Day festivities.

Jenny Abreu

Ford, M.D., M.H.A., dean and chief academic officer. "Be the best residents and doctors you can possibly be. You have the foundation you need to change the future of medicine."

The members of the Class of were the first to complete all four years of medical school with the revolutionary NextGenMD curriculum, which focuses on early exposure to the clinical setting, small-group learning and mentorship. All students choose a scholarly concentration pathway or a secondary degree as well.

"You did it! You are NextGenMD pioneers, and many of you are legacy students who joined our wonderful Class of 2024," said Hilit Mechaber, M.D., senior associate dean for student affairs. "You are prepared to serve patients throughout the world who greatly need you."

The students were highly competitive nationally, matching in 24 specialties across the country at top-tier institutions like Harvard, Johns Hopkins University, Yale and UC San Francisco.

The students — 62% of whom are women — will fan out to 30 states, with 53 staying in Florida for residency, including 35 at the University of Miami/Jackson Health System. Twenty-seven students will be attending programs in California, 17 in New York and 11 in Texas.

TOP SPECIALTIES FOR 2024

Internal medicine

34

General surgery

15

Pediatrics

14

Anesthesiology

14

FOUR TIMES A WINNER
UHealth IT won a CIO 100 award for the fourth year in a row for an AI-generated improvement in OR scheduling.

A Driving Force

First responder and Land Rover-lover Dr. Elizabeth Greig takes the wheel in a promotional campaign

If there's an exemplar of the nebulous expression "You are what you drive," it's Elizabeth Greig, M.D. '10. "I've had a real thing for Land Rovers since I was a little kid," said Dr. Greig, recalling her wonder years in England, where her family moved from Philadelphia. That's also where she nurtured a lifelong passion for the rugged, British-made Land Rover, introduced in 1948 as a precursor to the now-ubiquitous SUV. "It's my kind of car, and I've always driven one," she said.

Appropriately, Dr. Greig is a multipurpose rover herself. She landed back in the States for high school, majored in history at the Uni-

versity of Pennsylvania (while also coaching the men's water polo team and playing on the women's squad) and then worked as a global health care consultant in Philadelphia and Boston, an integral experience that shaped her career. "That's when I decided to go to medical school," Dr. Greig said.

She chose the Miller School largely for its global health opportunities. During her first year, she was part of a team that traveled to Haiti to provide medical assistance and subsequently conducted a research project on how to improve emergency management and disaster relief services on the island na-

tion. "We presented the report to the Haitian Ministry of Health and the prime minister in 2009," Dr. Greig said.

Around that same time, the Miller School established the Global Institute for Community Health and Development, an offshoot of Project Medishare, a nonprofit founded in 1994 to enhance health care in Haiti by faculty members Arthur Fournier, M.D., and Barth Green, M.D., currently executive dean for global health and community service.

In the days following the January 2010 earthquake that devastated Haiti, the two entities joined forces, sending dozens of medical volunteers to aid survivors. Among them was Dr. Greig, then in her fourth year, whose research paper was suddenly put into action. "We set up a field hospital in Port-au-Prince as part of a massive, emergency-response operation," she said.

Following an internal medicine residency at Weill Cornell Hospital in New York and a four-year faculty position at the University of North Carolina, Dr. Greig returned to the Miller School in 2017. Today, she's an assistant professor of medicine, treats patients at a UHealth facility on Fisher Island and at UM/Jackson Memorial Hospital, and, not at all coincidentally, is co-director of the Global Institute, which continues to manage programs in Haiti, as well as in the Bahamas and locally.

And yes, she's still behind the wheel of a Land Rover, specifically a 2023 Defender 110. Dr. Greig is such a devotee that she was recently selected by marketers of the brand (now part of India's Tata Motors) to appear in an ad campaign featuring owners. "There's a foldout with photos of me in the car and text about who I am, what I do and how I use my Defender," she said. "I've sort of become a literal poster child for Defender." —*Bob Woods*



Martin Juul Photography



A First for Multiple Myeloma

A new machine learning model gives a personalized prognosis for patients

For those with a diagnosis of cancer, the future can be dauntingly murky. That's true not just in a philosophical sense, but in a statistical sense, as well — most methods of predicting patient outcome are based on probabilities and averages, some of them not very precise.

Now, C. Ola Landgren, M.D., Ph.D., and a team of researchers at Sylvester Comprehensive Cancer Center and collaborating institutions have unveiled a computational model that aims to reduce that uncertainty for people newly diagnosed with multiple myeloma. The model is the first to offer a personalized prognosis based on the patient's tumor genomics and treatments.

The multiple myeloma field desperately needs better prediction tools, said Dr. Landgren, chief of the Division of Myeloma and director of the Sylvester Myeloma Institute. The number of treatments for the disease has dramatically expanded in the past two decades. That's great news for people who are now living much longer with

the disease than in decades past. But with so many options, clinicians need better ways to determine which treatment is going to work best for each patient.

"The future of the field will have to be focused on precision medicine," Dr. Landgren said. "There's no other way forward."

To build the model, the Sylvester researchers and their collaborators used genetic, treatment and clinical data from nearly 2,000 patients newly diagnosed with multiple myeloma. From sequences of the patients' DNA, the scientists identified 90 "driver genes" — genes bearing mutations in the cancer cells that appear to spur tumor growth. They then looked at the treatments each patient in their dataset received and how the patients fared with those treatments, matching treatment outcome to an individual's tumor genetic sequences.

The resulting computational model, dubbed the Individual Risk Model for Myeloma, or IRMMa, improves on previous prognostic tools because it takes into ac-

count the biology of patients' tumors. That's important in many cancers, but especially so in multiple myeloma, which is highly variable. In fact, their analyses identified 12 distinct subtypes of the disease, a classification which hadn't been made before. It is also flexible — a patient's prognosis from the model can be changed if, for example, they receive a transplant after a given treatment.

With newly developed therapies, especially immunotherapies, the amount of cancer is often less important than the nature of the cancerous cells. Different kinds of driver mutations in the tumor genome affect the cancer's growth, so certain subtypes of myeloma could have a very good outcome even if they're diagnosed when the cancer is widespread, assuming the right treatment is matched to the patient.

When new therapies become available, as long as there is data from at least a few hundred patients, the model can be updated to incorporate those treatments. And while the field isn't quite at the point of sequencing entire tumor genomes for every newly diagnosed patient, that might come in the near future as whole genome sequencing becomes more economical.

"More and more information will become available, and tools like this model are the future for optimized treatment and management," Dr. Landgren said. —*Rachel Tompa, Ph.D.*

'Historic' Decision

On April 12, following a presentation by Dr. Landgren and his team, the Food and Drug Administration's Oncology Drugs Advisory Committee voted 12-0 to recommend adopting a clinical trial endpoint called "minimal residual disease" to replace current requirements for accelerated drug approval. Dr. Landgren called the decision "historic," saying FDA adoption will speed new therapies to patients with multiple myeloma and other types of cancer.

Miller School scientists are studying how toxicants affect women's health and fertility | *By Louis Greenstein*

Plastics and Pregnancy

As go Superfund sites, so goes the overall environment. Toxic waste from former factories, processing plants, landfills and mining operations dot the U.S. landscape. Some of the waste seeps into groundwater and affects air quality in surrounding communities. Fifty-three of these Environmental Protection Agency-designated sites are in Florida, many of them close to high-density population areas around metropolitan Miami. For decades, scientists have been studying Superfund sites to learn about the effects of plastics as well as heavy metals and PCBs in the environment.

"There is a huge problem with the redistribution of toxicants in the environment when we have natural disasters," such as hurricanes, said Sylvia Daunert, Pharm.D., M.S., Ph.D., professor and Lucille P. Markey Chair of biochemistry and molecular biology at the Miller School. "We don't know the effects of the redistribution." Dr. Daunert and Michal Toborek, M.D., Ph.D., Leonard M. Miller Professor and vice chair of research, are the principal investigators on a multidisciplinary team for the University of Miami Superfund Program (UM-SRP), which combines research, training, community engagement and translation to study the effects of toxicants at the Homestead Air Force Base Superfund site.

"Plastics cause a lot of inflammation," Dr. Daunert said. "When the inflammation cycle

is started, there are a lot of different diseases that start, too." Little is known about the effects of plastics on health, she said, but recent research has revealed a correlation between plastics and inflammation in human metabolisms that has been associated with a host of diseases. According to the National Institutes of Health, autoimmune diseases such as rheumatoid arthritis, cardiovascular disease, gastrointestinal disorders, lung dis-

"Plastics cause a lot of inflammation. When the inflammation cycle is started, there are a lot of different diseases that start, too."

ease, asthma, high blood pressure and heart disease are all associated with inflammation. If plastics are at the root of inflammation, and plastics are everywhere, then risk assessment, detection and, when possible, remediation are increasingly critical.

The team has worked on Superfund projects for almost 30 years. "There is a lot you can learn, a lot of discovery, innovation, technology," Dr. Daunert said. UM-SRP gets seed money through U-LINK for idea development and preliminary data; the team is

now waiting to hear about funding from the National Institutes of Health to further their study of the redistribution of plastics from Homestead AFB, specifically to get a better understanding of how it affects women's health and fertility. Human fertility is declining worldwide, and the data suggest this can be traced to environmental toxins. "We want to continue working on it and get more data," Dr. Daunert said. "There is a lot to discover, a lot to be done."

UM-SRP's proposed project will provide data that should help with risk assessment and detection of plastics at other Superfund sites beyond Homestead AFB and hopefully help reduce the amount of toxicity in the environment everywhere.

COMPLEMENTARY EXPERTISE

The team benefits from expertise in a variety of disciplines including medicine, reproductive science, public health, chemistry, law, computer science and communications. "We wanted to take the program in specific directions," Dr. Toborek said. "We were looking for pieces of puzzles to complement each other. For example, we found scientists and physician-scientists with expertise in phthalates so we could look at changes related to pregnancy." Phthalates are chemicals that are added to plastics to make them pliable; they are in plastic food wrap, vinyl flooring, nail polish, hair gels and soaps. They can also be found in the air, in drinking water and in dust. Research suggests that phthalates disrupt hormones, leading to inflammation of the body's tissues. Because phthalates are ubiquitous in Superfund sites, data generated by this project should be applicable to other Superfund sites, other areas of the U.S. and globally.

"We have expertise in the health effects of environmental chemicals," Dr. Toborek said. "We need chemists who can detect and remediate phthalates and a huge team of people who can bring this to the public" and effectively communicate the risks.

"This is a perfect example of how to use mul-



tidisciplinary teams," said Dr. Daunert said. "We have strong infectious disease doctors and researchers, but they need to team with psychologists and go into the community."

BUILDING LOCAL CONNECTIONS

"Interdisciplinary team science is the way to go for future research," Dr. Toborek said. "I strongly believe grants should be community-oriented to make local residents interested in research and engage them in

the discovery process." The team is developing relationships with communities around Homestead AFB through the office of Councilwoman Patricia Fairclough-Staggers.

"Even more important, we are very actively engaged in outreach activities to predominantly Black Miami-Dade public schools," Dr. Toborek said. Miller School graduate students created the Biochemistry and Molecular Biology Graduate Student Government to introduce environmental science to high school

students by bringing them to the team's labs. The students are largely from underrepresented minorities and from schools that lack sufficient STEM programs. "In fall 2022, we hosted more than 60 students for a full-day field trip," Dr. Toborek said. Visiting students learn about resilience to environmental challenges and effective remediation methods. "You have to go to the young people and educate them about science and make them aware and excited," he said.

Involving the public is also a way to combat misinformation. "We have to start early in educating the new generation," Dr. Daunert said.

The Superfund program is one of more than 80 projects related to climate resilience that are being conducted under the banner of the University of Miami's Climate Resilience Academy. According to Executive Director Michael Berkowitz, there are two sides to the climate conversation. The first is mitigation, which is about stopping seas from warming and ultimately reversing the effects of climate change. The second is adaptation and resilience, which means helping communities manage the im-

pact. The academy, he said, is about the latter: "It's about building capacities. That could mean better infrastructure, better prediction methodology, stronger seawalls." It could also mean "more cohesive communities where neighbors check on neighbors," he added. "All of those things will help communities survive the next climate shock." 🌍

For more on research into the effects of plastics on human health, see page 10.

Genetic engineering could save thousands of lives

| By Josh Baxt

Ending the Transplant Organ Shortage

According to the federal Health Resources and Services Administration, more than 100,000 people in the United States are waiting for organ transplants, and 17 die each day. The vast majority — around 88,000 — need kidneys. Now, a research team at the Miller School may have developed a solution — transplanting donor organs from genetically modified pigs. If their research is successful, the use of such organs could shorten the wait and save countless lives.

The team leader, Alfred Tector, M.D., professor of transplant surgery in the DeWitt Daughtry Family Department of Surgery, is part of an intergenerational effort to improve organ transplants. His father, Alfred (Cy) Tector, M.D., was a pioneering heart surgeon in Wisconsin. The younger Dr. Tector has vivid memories of learning about heart transplants from his dad.

“I first got interested around 1984,” Dr. Tector said. “I used to follow my dad around the hospital where he had his transplant program. But I noticed most of the people waiting for transplants were dying.”

Dr. Tector’s father did everything he could to help his patients, including inventing new devices and being the first in Wisconsin to

implant the Jarvik artificial heart. But the math wasn’t their friend — there just weren’t enough donor organs to meet the need.

However, another promising source has gone mostly untapped: mammalian organs, or xenotransplants. In 1984, “Baby Fae” received a baboon heart and survived for around a month. The technology was crude, but the possibilities were tantalizing.

Now, Dr. Tector and colleagues are poised to make xenotransplantation a reality — not with primates but with pigs. Advanced gene editing and other techniques are making these organs more acceptable to the human immune system. In the next few years, this technology has great potential to alleviate chronic organ shortages.

THE POTENTIAL OF PIGS

On a technical level, organ transplants have become routine. However, the lack of transplantable organs has created a severe bottleneck. Porcine xenotransplants could be the solution. Pigs grow rapidly, and their organs are quite similar to those in humans.

“The pigs we are developing could potentially be used for kidney, liver, heart, lung or pancreas transplants,” Dr. Tector said. “The challenge has been the human antibody response.”

Human antibodies bind to sugars on pig organs, leading to rapid rejection. To fix this,

Dr. Tector’s team is using CRISPR-Cas gene editing to delete the offending sugars. By eliminating these antigens, the group could initially open up xenotransplantation to about 30% of waiting kidney patients.

Research Associate Professor Jose Estrada, D.V.M., Ph.D., has been working on xenotransplantation for more than 17 years. His goal is to make safe organs for human transplant, and as gene editing techniques have evolved, that job has gotten easier.

“With the first pig we produced, we used a technique called homologous recombination to edit its genome,” Dr. Estrada said. “To produce one pig with this system took between two and three years. Now, using CRISPR-Cas, we can make similar modifications in months or no more than a year. It makes a huge difference.”

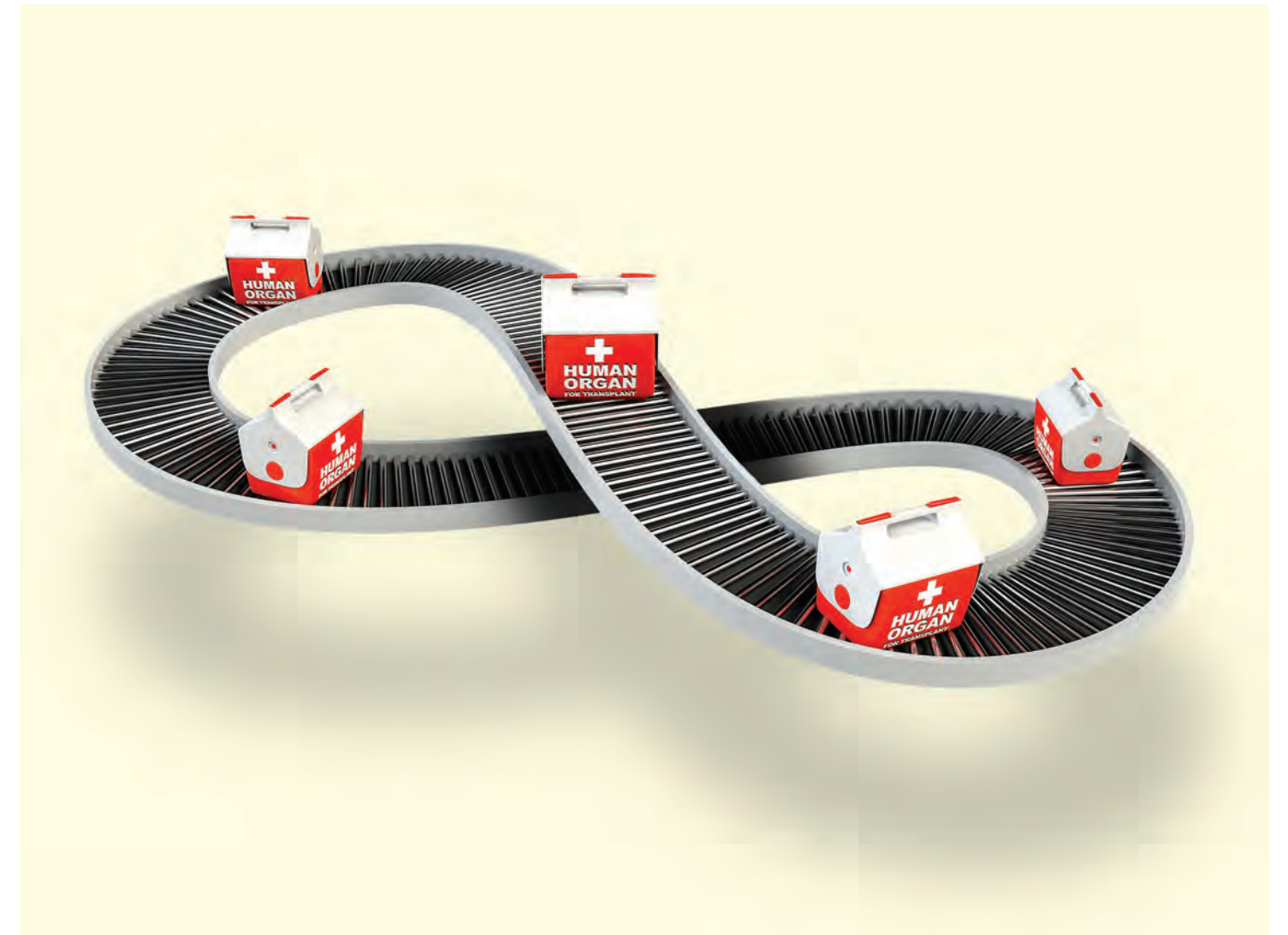
CRISPR-Cas is a two-molecule system that offers a fast and relatively easy gene

Advanced gene editing and other techniques are making these organs more acceptable to the human immune system.

editing tool. First developed in 2012, the CRISPR molecule acts as a guide, leading the protein complex to the gene of interest. The Cas molecule (often Cas9) acts as molecular scissors, cutting the gene.

Drs. Tector and Estrada are removing the genes that lay down antigenic sugars. Without them, the organs more closely resemble human versions. Patients will still need to take anti-rejection drugs, but their new organs likely won’t face the body’s destructive antibody response.

The group starts by editing porcine skin cell DNA. From there, the most promising



cells are isolated and their nuclei removed. These nuclei, and their all-important genetic material, are then placed in egg cells and implanted. Around 114 days later, the engineered pigs emerge. The results have been quite promising.

“We have knocked out three genes responsible for human immunological rejection,” Dr. Estrada said. “We are also knocking out histocompatibility genes (SLA 1 and 2) to make the organs more tolerable in the human body.”

A PHASED APPROACH TO HUMAN PATIENTS

The team is continuously refining their methods. Recently, they finished developing crossmatch testing to give these xenotransplants the highest chances of success. This

process alone took 10 years.

“That’s a big advantage,” Dr. Tector said. “It allows us to select the patients who have the best chance to do well, so we don’t lose people or transplant them unnecessarily when they’re not going to benefit.”

The researchers are now working with the U.S. Food and Drug Administration to rigorously test these xenotransplants before moving to human patients. Dr. Tector envisions a phased approach in which early patients are given pig organs as temporary stopgaps on the way to human transplants. In following years, the team hopes to carefully extend the time patients continue with their xenotransplants. Eventually, they would be used permanently.

While kidneys are the first step, Dr. Tector’s team is also pursuing liver xenotran-

plants. Pig livers pose a different biological problem than kidneys: They tend to destroy human platelets, dramatically increasing the risk of patients bleeding out. However, the researchers have identified the genes associated with this complication and are studying possible solutions.

The group hopes to engineer better-tolerated organs to expand the number of patients who might benefit from xenotransplants. In the distant future, they envision an even more exciting, personalized approach: engineering animals that are precisely compatible with individual patients.

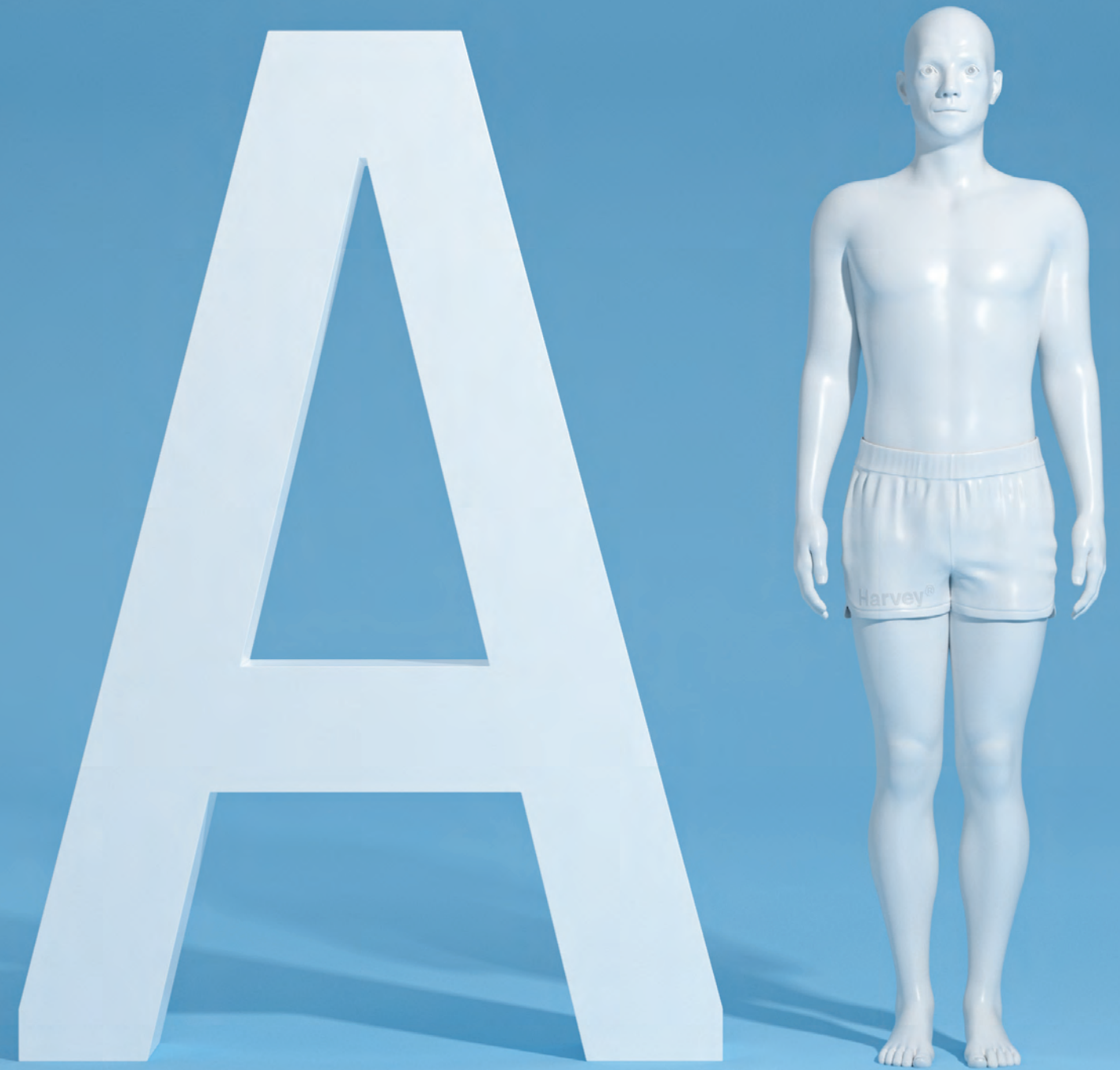
“If time allows, we could, hypothetically, produce a specific pig for each patient,” Dr. Estrada said. “It would be as closely cross-matched as we could make it. That is one of our long-term goals.”

SIMULATION GETS SMARTER

AI opens a new chapter in the Gordon Center's innovative medical training and education programs

BY CHAD HANSON

ILLUSTRATIONS BY SPOOKY POOKA / PHOTOGRAPHY BY JEFFERY SALTER



SINCE THE LAUNCH

in 2022 of OpenAI's ChatGPT and various other tools, the possibilities offered by artificial intelligence have been a source of fascination and speculation in the field of medicine. But underneath lurks a wary question: Will computers replace physicians?

Barry Issenberg, M.D. '95, director of the Gordon Center for Simulation and Innovation in Medical Education at the Miller School, says that's not a real threat.

"The discussions are actually about how AI can augment, not replace, the work of a practitioner," Dr. Issenberg said. "A lot of the applications of AI within simulation training and patient care are about augmenting human performance."

Dr. Issenberg and his colleagues are in the early stages of using AI and other new technologies to enhance the training the Gordon Center provides to more than 20,000 medical students, providers and emergency responders every year. He believes their application to the Gordon Center's simulation training will evolve quickly, and to the benefit of trainers and trainees alike.

A HISTORY OF INNOVATION

The Gordon Center's innovative use of simulation in training and education stretches back nearly 50 years, and its intellectual underpinnings even further. The designated Center of Excellence owes much of its international reputation to Michael S. Gordon, M.D., Ph.D., a cardiologist who, in the late 1960s, recognized the potential of simulation for creating realistic training scenarios for aspiring physicians.

Dr. Gordon was a pioneer in the early integration of technology and medical education, a techie before tech was cool. In 1968, he unveiled Harvey®, a cardiology patient simulator whose direct descendants continue to be a vital training tool for medical education.

Dr. Issenberg and his colleagues are continuing Dr. Gordon's forward-thinking work. Patient simulators are now produced in different genders, ages and skin colors, with increasingly sophisticated computer-programmed responses that better mimic human medical conditions. In addition, 3D printing is used to create anatomically accurate models for surgical planning and training. It allows for customization of patient-specific anatomy, enhancing the realism and

"WITH AI, THE FUTURE WILL BE DEFINED BY ITS INTEGRATION WITH OTHER EMERGING TECHNOLOGIES. HOW DO WE INCORPORATE IT WITH VIRTUAL REALITY AND AUGMENTED REALITY AND MIXED REALITY?"

relevance of surgical rehearsals. Bringing health care to the metaverse, wearable technology devices such as smart glasses or haptic feedback gloves enhance simulation training, as they provide a more immersive experience and simulate more realistically the audiovisual and tactile feedback of medical procedures.

"Performance in a simulation can predict real-world behaviors," said Ross Scalse, M.D., the Gordon Center's director of educational technology development and professor in the Miller School's Department of Medicine. "The more authentic the simulations are, the more likely the training exercises will translate to better patient care in actual clinical environments."

A new program takes one group of caregivers a step further: The community paramedicine program teaches paramedics how not only to recognize and evaluate medical problems, but also to identify patients' social determinants of health, such as housing or access to medicine, and refer them to services as needed. The goal is to reduce hospital readmissions of people whose living situations keep them coming back because they never really get well.

FASTER TRAINING EVALUATIONS

Dr. Issenberg believes that AI will be most useful to simulation training in evaluating performance for procedure-based tasks. Surgery is an obvious match, as it relies on a specific procession of steps that lead to a successful outcome. The current process often involves faculty reviewing lengthy videos of surgical trainees to determine if those steps were followed correctly. Absent technological intervention, that approach takes a long time and can lead to waning concentration after a few hours. This is where AI — augmented intelligence, in this case, as it's helping rather than replacing a person — can prove beneficial.

"The procedure's order and steps are well defined, so we can develop algorithms for an AI application and then feed the application training videos," Dr. Issenberg said. "The application learns from those videos, and after a relatively short period of time, it's as accurate as an expert."

The expertise the AI application develops enables it to pinpoint errors and reduces the time needed for review from hours to minutes. AI also provides the opportunity to assess the effectiveness of the curriculum itself by identifying where trainees struggle or perform without proficiency. That assessment allows faculty instructors to review and revise training materials as soon as an issue surfaces, rather than waiting for the end of the semester.

REALISTIC CURRICULUM DEVELOPMENT

In many ways, the transition from medical student to physician is a movement from theory to practice. Students absorb theories from textbooks to learn how to address medical problems and put that knowledge into practice when the "M.D." formally appends their name. Problems arise when patients deviate from the textbook.

"Medical students read about one or two prototypical cases in a

EVERY SECOND COUNTS

Adding medical treatment simulations to active shooter response training can save lives

The Gordon Center has opened Florida's first regional training hub in Tallahassee to provide its innovative, collaborative active shooter response training to law enforcement. Supported by funding from the Florida Department of Education, the curriculum expands traditional active shooting response to include basic medical training for law enforcement officers.

"It's not just the paramedics doing medicine," said Vincent J. Torres, emergency management director for the University of Miami Health System and the Miller School, and associate director of disaster management at UM's Global Institute for Community Health and Development. "It's cops doing medicine, too — putting on tourniquets, putting on chest seals. Every second counts."

The active shooter curriculum has benefited from the U.S. Army Trauma Training Detachment's expertise and input, which conducts all of its pre-deployment Army Forward Surgical Teams training at the Gordon Center's Miami facility.

"They're teaching these teams how to work in the battlefield, literally from point-of-care injuries to surgery," said Al Brotons, director of training operations at the Gordon Center. "We brought them in to help us create this course, because who knows better than they do?"

Since the mass shooting at Columbine High School in Colorado in 1999, active shooter response training has advocated for medical personnel to wait for police or SWAT teams to secure the shooting

environment, known as the "hot zone." The approach has changed over the years, and the Gordon Center curriculum now prepares medical personnel to enter areas where the shooter is known to be absent (the "warm zone") alongside law enforcement. This change translates to quicker, potentially lifesaving treatment for victims in safer locations.

"We define this as a rescue task force," Brotons said. "Law enforcement officers and medics go in together, as a team."

Brotons and Torres test their students' mettle with three-tiered, increasingly complex active shooter exercises, with real people playing shooter and victims.

The sequence's first scenario is relatively simple, with one room and a couple of shooting victims. The second — multiple rooms, multiple victims — poses a greater challenge to communication and coordination of movements. The final scenario extends the chaos and uncertainty, with an entire building to account for, amidst blaring alarms and the screams of the simulated victims.

In actual active shooter situations, coordinating that action isn't simple. This new approach helps create one cohesive team under a unified command.

"You can have a million cops and a million firefighters responding to an active shooting. If they're not getting direction from a unified command structure, nothing positive is happening," Torres said.

—Chad Hanson

Vincent J. Torres (left) and Al Brotons





textbook,” Dr. Issenberg said, “and then on their first day at UHealth Tower or Jackson Memorial Hospital, they see a patient who doesn’t look anything like what they read about in a textbook or learned during a lecture.”

Simulation training strives to bridge the gap between theory and practice by accounting for deviations from the norm and presenting as varied a curriculum as possible. But time, that relentless obstacle, can make that challenging.

“Having a large number of training cases is important,” Dr. Issenberg said, “but it takes a lot of time for faculty to come up with these cases.”

AI, however, doesn’t need much time to synthesize a large volume of de-identified patient notes and capture all the variables in that data set.

“In a matter of minutes, we can create a large library of patient simulation cases using AI,” Dr. Issenberg said.

BETTER SCRIPTS FOR PATIENT SCENARIOS

Vivian Obeso, M.D. ’00, an associate professor of medical education, is spearheading a project that does just that. Dr. Obeso is in the early experimental phase of using ChatGPT to generate realistic, varied patient scenarios that can be used for clinical training and assessment. Currently, Miller School faculty develop those scenarios, which are translated to conversational scripts that actors use in face-to-face encounters with medical students. It can be arduous work.

“The scripts need to be developed carefully,” Dr. Obeso said. “It usu-

ally takes at least a couple of faculty members to write them and get the appropriate feedback. The scripts must be accurate enough to portray a realistic patient scenario. It can take hours, sometimes days.”

Not with ChatGPT and similar generative natural language processing applications. Dr. Obeso is posing and refining prompts that include information about de-identified patient symptoms, health history and physical examination findings, then asking ChatGPT to produce plausible scripts that support a given differential diagnosis. The preliminary results demonstrate that AI can do a pretty decent imitation of a real patient scenario with a carefully developed prompt.

“I started with broad questions but found that ChatGPT does better with more detailed inquiry,” Dr. Obeso said. Given the proper specifics, “it does a good job generating patient cases that include pertinent posi-

“THE MORE AUTHENTIC THE SIMULATIONS ARE, THE MORE LIKELY THE TRAINING EXERCISES WILL TRANSLATE TO BETTER PATIENT CARE IN ACTUAL CLINICAL ENVIRONMENTS.”

TEACHING THE TEACHERS

A simulation fellowship trains global medical educators

The Gordon Center’s Simulation Education and Research Fellowship draws physicians from around the world to learn how leading-edge simulation practices can enhance clinical skills and address real-world medical challenges.

“The idea is to train a group of people in simulation-based education as well as broader medical education principles,” said Ross Scalese, M.D., the Gordon Center’s director of educational technology development and associate professor in the Miller School’s Department of Medicine. “Medical school and residency are mostly focused on clinical training and biomedical research, but education is quite different. It’s not something people routinely get in their medical training.”

This can create a disconnect. Many gifted physicians are asked to teach trainees but have little educational training of their own. Medical education is a distinct discipline. Through these fellowships and other programs, the Gordon Center fills that gap.

EXPANDING MEDICAL EDUCATION FRONTIERS

The Gordon Center has accepted 18 international fellows since 2010. The current fellow, from Brazil, is Samia Medeiros Barbar, M.D., a pediatric cardiologist at the University of São Paulo’s Heart Institute.

“Dr. Barbar will direct a new simulation center being built at her institution,” Dr. Scalese said. “She’s already an attending in pediatric cardiology, but she’s going to take on this new role running the simulation center.”

Dr. Barbar’s interest in medical education started at the Heart Institute, which sees both adult and pediatric patients. However, few of the cardiology nurses had pediatric experience.

“Children with congenital heart disease are quite different,” Dr. Barbar said. “Their oxygen saturation levels are different. Their blood pressure levels are different. This made the nurses a little uncertain when dealing with kids, and they were very open to learn.”

Dr. Barbar enjoyed training the nurses and wanted to dive deeper into medical education. She began the Gordon Center fellowship in

September and will stay in Miami for a year.

“I’m getting experience in how to use simulation in different settings for different levels of expertise — medical students, residents, postdocs,” she said. “It’s similar to what we plan to do back home.”

The fellowship is also helping Dr. Barbar understand how soft skills like communication augment technical capabilities. She is eager to share what she is learning, which dovetails nicely with the Gordon Center’s mission.

“These fellowships give us a great opportunity to spread the word about education and simulation, and how those can really improve patient care,” Dr. Scalese said. “It also builds a worldwide community. We see former fellows at conferences, and it’s just a great feeling to see how well they’ve done. Hopefully, we’ve played a small part in that.” —*Josh Baxt*

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A LARGER VOICE FOR SIMULATION

Dr. Barry Issenberg now leads the Society for Simulation in Healthcare

Barry Issenberg, M.D., is director of the Gordon Center for Simulation and Innovation in Medical Education. Under his leadership, the Gordon Center uses innovative technologies to simulate medical issues and provide real-world training to nearly 20,000 health care professionals and emergency responders annually.

In recognition of his nearly 25 years of health care simulation experience, Dr. Issenberg, who is also senior associate dean for research in medical education, in January was named president of the Society for Simulation in Healthcare. The organization, which seeks to improve performance and reduce errors in patient care through the use of simulation, was founded in 2004 and has more than 4,000 members worldwide. We asked Dr. Issenberg about the goals of his presidency and how he plans to confront the challenges facing health care simulation.

WHAT DOES THIS NEW POSITION MEAN TO YOU PERSONALLY AND PROFESSIONALLY?

My journey with SSH has been enriching, encompassing various roles that have provided me with a comprehensive understanding of its mission, ensuring a holistic view and a team-based, consensus-building approach essential for effectively serving our membership. In addition, my senior leadership roles at the Miller School have broadened my understanding of the diverse needs, challenges and opportunities inherent in collaborating with professionals across all levels, disciplines and specialties.

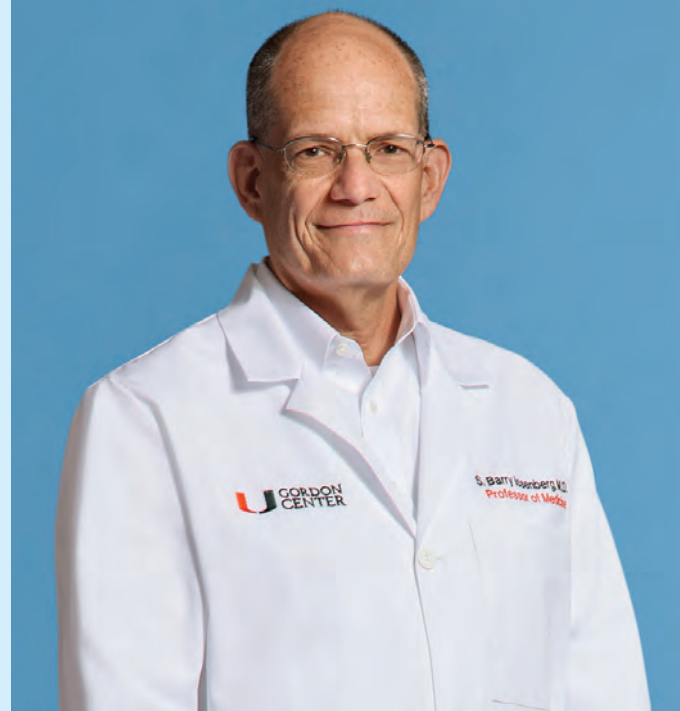
WHAT DO YOU HOPE TO ACCOMPLISH DURING YOUR TERM?

I hope to expand the society's role in serving the global practice community to enhance health care quality. This will require a mindful and direct approach to ensure our membership is reflected in its diversity of backgrounds and ideas. I am advocating for a transdisciplinary approach to propel research and innovation while fostering education, professional growth and leadership development. In a world of increasing complexity and dynamic challenges, SSH must play a pivotal role in addressing and solving issues identified over the past quarter-century. This includes exploring how simulation can lead to improved patient safety and health care quality.

HOW DO YOU SEE SIMULATION IMPACTING PATIENT CARE?

Extending simulation-based health care education from simulation centers to real-world health care delivery and patient outcomes complements biomedical and clinical translational science. We must integrate simulation more seamlessly into the health profession's education and practice, ensuring broader access to technology for learners and providers. It's crucial to examine how simulation centers can support the missions of health profession schools and both academic and non-academic health systems. To do this, SSH intends to strengthen strategic collaborations with traditional health care academia partners and build new relationships with key national and international governmental and nongovernmental organizations, as well as industry partners from the education, technology and health care sectors.

Dr. Barry Issenberg



WHAT ARE THE CHALLENGES WITH HEALTH CARE SIMULATION?

Two of the most common and long-standing challenges include its integration into existing curricula and measuring its effect and impact. Effectively integrating simulation into existing curricular programs can be difficult, making collaboration between educators, clinical experts and administrators very important. As with any new technology, curriculum development should be flexible, allowing for the incorporation of simulation in a manner that complements traditional teaching methods. In addition, demonstrating the impact of simulation training on clinical outcomes can be complex. Implementing robust evaluation frameworks and using data analytics to assess performance and outcomes are crucial for conducting long-term studies linking simulation training to clinical practice improvements.

Advanced simulators and technology-based simulations can be expensive, and maintaining these systems requires significant resources. Institutions can collaborate to share resources, seek funding through grants or invest in scalable and reusable simulation tools. Utilizing more cost-effective virtual or augmented reality technologies can also reduce expenses. Investing in training for technical staff and educators is essential, as partnerships with technology providers for support and training can also be beneficial. Because not all institutions or regions have equal access to high-quality simulation facilities, the use of mobile simulation units and remote or tele-simulation platforms and online programs can enhance accessibility. These issues often hinder the ability to ensure consistency in simulation quality and methodologies across different training sites or institutions. Developing and adhering to national and international standards and accreditation systems and regularly benchmarking and supporting peer reviews can help maintain consistency.

Finally, resistance to change and skepticism about the value of simulation often hinder its adoption. What helps is building a culture that values continuous learning and improvement. This must be complemented with evidence that demonstrates the effectiveness of simulation through research and case studies. —Chad Hanson



AUGMENTING PHYSICIANS' SKILLS

Listen to Dr. Barry Issenberg's podcast discussion with Dean Henri Ford about how new technologies benefit trainers and trainees alike.

by assessment or takes them straight to assessment to demonstrate their expertise in stroke care. With each answer, an AI-driven algorithm evaluates the student's knowledge and level of confidence and calculates what content to present and what question to ask next.

"We've been talking about this in education for a long time," Dr. Motola said. "This enables us to provide truly individualized content using a mastery learning model."

EMERGENCY IDENTIFICATION

In emergency situations, paramedics are ultimately trying to answer a self-evident question: How can I help this person?

A less obvious query — Who is this person? — is crucial to answering that first question. Patient identity carries with it their medical history, including previous diagnoses, hospitals where they're most often seen, medications taken and known allergies, all of which factor into the paramedic response. People who are unable to tell emergency responders who they are due to cognitive deficit or temporary incapacitation complicate these already high-pressure situations.

Dr. Motola and colleagues are turning to AI-driven facial recognition software to identify patients who, due to unconsciousness or conditions like dementia, are unable to identify themselves. In a study, paramedics were divided into two groups. One loaded a facial recognition program on their phones that provided both the patient identity and important medical information and used it in a realistic clinical simulation scenario involving standardized patients (actors) who were unable to identify themselves. The study's control group didn't have access to facial recognition software. Both groups were asked to treat the standardized patients as they would in a real emergency.

"We looked at the paramedics' decision making, in particular if the paramedics took the patients to the hospital where they receive most of their care," Dr. Motola said. "That's very important, because having access to prior medical history, especially in complex cases, is critical for the best patient management and outcomes."

The study group that used facial recognition outperformed the control group by making better initial decisions about treatment and by taking the patients to their preferred medical facilities.

"Having access to the facial recognition software impacted the paramedics' medical decision making in a positive way," Dr. Motola said.

CHANGING REALITY

With AI, the future is always now, and today's revolution is tomorrow's antiquity. Dr. Issenberg is already anticipating — and relishing — how simulation will change with technology's relentless shifting and churning.

"With AI, the future will be defined by its integration with other emerging technologies," Dr. Issenberg said. "How do we incorporate it with virtual reality and augmented reality and mixed reality?"

Extended reality is an umbrella term that encompasses a variety

"AI-DRIVEN SIMULATIONS ARE HEAVILY RELIANT ON THE QUALITY OF DATA THEY ARE FED. IF THE DATA ARE INCOMPLETE, OUTDATED OR BIASED, IT CAN LEAD TO INACCURATE SIMULATIONS."

of technologies, including virtual reality (an immersive, completely digital environment), augmented reality (the incorporation of virtual objects into real environments), and mixed reality (the interaction between real and virtual objects).

Extended reality is currently used in immersive video games and the creation of new automobile designs. In health care, some hospitals use virtual reality headsets to ease patient stress prior to surgery and smartphone-accessible educational applications to introduce care plans.

Dr. Issenberg believes extended reality will soon be a central component of enhanced training theaters at the Gordon Center. He uses a particular procedure, chest tube insertion, as an example. Manikins have come a long way since Harvey 1.0, but they don't offer a complete portrayal of the human chest cavity.

"Using extended reality, we'll be able to superimpose the anatomy of a patient on the simulator so the trainee can see the underlying structures of the chest," Dr. Issenberg said.


In fact, the tube a trainee inserts into the chest may be AI-enhanced, which would also allow the application to precisely monitor its movement.

"We'll be able to see where that tube is going," Dr. Issenberg said, "and give the learner feedback in real time, with comparisons to their own benchmarks and, most importantly, the gold standard for that training."

AI TRAINING'S CHALLENGES

While AI's anticipated impact on medicine is exciting, "overreliance on AI in training simulations could potentially diminish the trainees' ability to develop critical thinking and decision-making skills," Dr. Issenberg said. "They might become too dependent on AI recommendations and analysis. As educators, we need to guard against that effect and demonstrate the serious implications of relying too much on this new technology."

As Dr. Obeso learned in her first forays into ChatGPT, AI is only as good as its source material. Bad data means inadequate or even harmful training.

"AI-driven simulations are heavily reliant on the quality of data they are fed," Dr. Issenberg said. "If the data are incomplete, outdated or biased, it can lead to inaccurate simulations, which may misguide trainees rather than helping them." 



SUDDEN IMPACT

A plane crash exercise tests our disaster response

By Robert C. Jones Jr. and
Janette Neuwahl Tannen

The fuselage of a 20-passenger private jet lay across a major roadway just in front of Sylvester Comprehensive Cancer Center. Next to the plane, a badly crumpled shuttle bus lay on its side. The vehicle, occupied by a group of VIP French dignitaries visiting the medical campus, had been broadsided by the plane that crashed on the roadway.

With bystanders looking on, fire and rescue personnel extricated victims trapped in the wreckage, carrying the wounded to a triage area in front of Sylvester.

While the carnage in the heart of Miami's Health District in the early morning of Sunday, November 12, looked very much like a real-world mass casualty incident, in reality it was a drill orchestrated with all the precision of a Hollywood disaster movie.

Codenamed "Operation Fallen Archangel," the exercise tested the readiness of the emergency response team of UHealth – the University of Miami Health System and a multitude of local, state and national agencies.

"It was critically important to make this look as real as possible," said Vincent J. Torres, emergency management director for the Miller School and UHealth, who was instrumental in planning the exercise. 🚒

Drone photograph by Daniel Menendez



Scan here to watch a video of the exercise.

Voices

INSIGHTS FROM THE DIVERSE MILLER SCHOOL COMMUNITY | *By Bob Woods*



Social media posters
Victoria Jenifer
(left) and
Amanda Kaine

As Seen on Social

In an era dominated by digital communication, academia is shedding its traditional veneer and embracing the role social media plays in communicating a school's values, achievements and impact to a wider audience. And the Miller School is leading the way with its #MedCanes Ambassador Program, launched last fall. The initiative recruits top-tier students who are interested in sharing stories about life on and off campus via social media platforms. Victoria Jenifer, M.D. Class of 2026, and Amanda Kaine, MiBS Class of 2024, were selected as the spring 2024 ambassadors. They both took some time out of their busy academic and extracurricular schedules to talk about being representatives of the Miller School.

What does being a #MedCanes Ambassador involve?

Jenifer: We began by meeting with the marketing and communications team to figure out what content we want to create for our posts, which we share on TikTok and Instagram. In my first post, I introduced myself and talked about some of my interests and what kind of content viewers can expect from me. The second post will be a day in my life as a med student.

Kaine: My first post is a narrative about my academic path, which has been kind of nontraditional. I'm in the middle of my gap year before going to medical school. I am enrolled in the Master of Science in Biomedical Sciences (MiBS) Program. I'm interested in becoming a physician-scientist in the academic setting, subspecializing in trauma and burn surgery.

Without giving away too many spoilers, can you tell us some of your accomplishments?

Kaine: I'm a certified emergency medical technician, nutrition coach and advanced cardiovascular life support provider, and I've served as a first responder and an emergency room technician.

Jenifer: The Miller School's NextGenMD curriculum allows us to do rotations in our second year. I'm a kinesthetic learner — someone who learns by doing — so watching the residents, fellows and physicians during rounds has taught me so much. When I'm not in classes or the hospital, I love working out at the gym and going to the movies or out to eat with friends. Medical school can be stressful, so you have to find ways to recenter yourself, and I am proud that I have accomplished some form of balance.



Cancer Researcher Focuses on the Underrepresented

Dr. Julio Pimentel praises the training he received at the Miller School

Julio Pimentel, Ph.D., MSCTI '18, is nationally recognized for transforming patient care through innovative research in therapy-resistant cancers and raising cancer awareness among underserved populations.

Dr. Pimentel is a first-generation Mexican American, and his desire to serve as a liaison between the Hispanic community and the medical field began at an early age. He was a teenager when his volunteer experience at a local hospital inspired him to pursue a Ph.D. in cancer research.

"I wanted to understand why some tumors were responsive to treatment and others were not," said Dr. Pimentel, a postdoctoral fellow at the University of California San Diego. "I also felt a responsibility to help the underserved."

With no prior bench or clinical experience in cancer research, Dr. Pimentel wanted to diversify his skill set before earning his Ph.D. He enrolled in the Miller School's Master of Science in Clinical and Translational Investigation, or MSCTI, program, which trains students in the principles and practice

of translational science and clinical research. The program allowed him to investigate different cancers and novel therapeutic options for therapy-resistant cancers — training that laid the groundwork for his Ph.D. coursework.

"The program exposes clinicians to science and scientists to medicine," Dr. Pimentel said. "By working collaboratively in multidisciplinary research teams, I was able to expand my research and learn how to effectively present it to a diverse set of audiences."

Dr. Pimentel has received multiple awards for his work, which focuses on the molecular mechanisms of vascular inflammation, immune evasion and deregulated cell death pathways in triple-negative breast cancer.

Dr. Pimentel's plans include leading his own cancer research lab and directing a cancer research program.

"I want to help teach medical students to become better scientists and continue to raise cancer awareness among underrepresented populations," he said. — *Debby Teich*

Naresh Kumar, Ph.D.
Professor, Environmental Health and Biostatistics

“

We need to balance all parts of our lives, including excess use of energy and/or resources. This knowledge has been with us for about 3,000 years, but we have failed to practice it. Climate change is no different. Earth is our home, and our existence depends on it. ... We know that climate change is inevitable and that our addiction to fossil fuels has accelerated the pace of climate change and its impact on the environment and human health. To put a brake on this pace, we need to use resources wisely, abstain from excess consumption, and prepare and adapt ourselves to the anticipated changes in the environment.” — *Louis Greenstein*





Anaya Hill
Student Researcher

“My freshman chemistry professor, Dr. Christian Agatemor, invited me to join his research team. Last summer I worked on a pancreatic cancer project, studying lactylation, which plays a vital role in cancer, inflammation and regeneration. My project was about the role lactylation plays in cell transformation. In the fall, I presented my findings at an NIH symposium in Bethesda, Maryland. It was very special for me to step into that space, representing myself, my family, my school and my lab. The experience gave me a great sense of accomplishment and confidence. I am still a member of Dr. Agatemor’s research team, and I can see myself getting a Ph.D. and becoming a research scientist.”

Meeting Them Where They Are

Miami Street Medicine volunteers provide free health care services to Miami-Dade’s homeless populations

On Saturday mornings, about a half dozen Miller School students and physicians take to the streets of Miami — or, more to the point, to the unsheltered people who live on the streets. They’re among the more than 30 volunteers who comprise the aptly named Miami Street Medicine, a nonprofit founded in 2018 by then third-year Miller School student Dan Bergholz, M.D. ’23. This organization falls under the umbrella of Dade County Street Response, started by UM faculty member Armen Henderson, M.D., M.B.A., assistant professor of medicine.

During their weekly street rounds, the MSM teams encounter individuals with any number medical issues, including various skin conditions, said Jonette Keri, M.D., Ph.D., a professor of clinical dermatology and

cutaneous surgery, as well as a regular MSM volunteer and member of its advisory board. “At least half of the people we see have something on their skin. I see a lot of ringworm, bug bites and dermatitis, which are often very treatable right there,” she said. “We also care for chronic wounds and other cutaneous infections, as well as coordinating skin cancer removal for patients.”

“Our department has a strong history of community service,” Dr. Keri said, adding that the medical students on the MSM teams “are the best part of this. The residents on the streets know them and trust them. I’m just a cog in the wheel who goes along with them, and I’m thankful for that. It’s one of the most rewarding and fulfilling things I’ve done in my career.”



Avoiding the ‘Valley of Death’

Dr. Suhrud Rajguru helps faculty entrepreneurs avoid missteps as they bring ideas to commercial life

To the layman, the term “valley of death” sounds pretty ominous, like someplace Indiana Jones has to daringly escape. But to scientists, researchers, physicians, engineers and other practitioners who delve into the biomedical realm, those words have real-world meaning — and implications. “The valley of death is the obstacles and challenges that everyone interested in developing their biomedical research into new medical diagnostics, therapies and devices will face,” said Suhrud Rajguru, Ph.D., a professor of otolaryngology and biomedical engineering at the University of Miami.

“How do we take something from basic biomedical research and translate it into clinical practice or the commercial market to benefit people and improve human health?” said Dr. Rajguru, who is also co-director of the university’s Clinical and Translational Science Institute’s Workforce Development program. All too often, he said, that opportunity is lost — in the valley of death.

It costs, on average, \$2.5 billion and takes 15 to 18 years to bring a new drug to market. For medical devices, the cost can reach

hundreds of millions of dollars and take many years. The pathway from concept to approval by the U.S. Food and Drug Administration is fraught with challenges regarding funding, research reproducibility, transdisciplinary expertise, clinical trials, and regulatory and administrative processes.

To help, the university, including the Miller School, has launched a number of initiatives. For example, through CTSI, Dr. Rajguru spearheads a five-week entrepreneurial training course based on the National Science Foundation’s Innovation Corps (I-Corps) program. “We’ve already trained 72 teams in Florida and 300-plus across the United States, and a number of them have gone on to create grant-funded startup companies,” he said.

Similarly, the University Student Accelerator program, known as USTAAR, brings together multidisciplinary teams of students and trainees from the Miller School, the College of Engineering, the Miami Herbert Business School, the School of Law and other areas across the university to nurture ideas from inception to implementation. “USTAAR is providing fundamental training, mentor-

ship and financial support for idea development and commercialization,” said Dr. Rajguru, who serves as the program’s director.

Besides his varied academic roles, Dr. Rajguru represents a case study in translational research. Beginning in 2011, when he joined the U, the NeuroTherapeutics Group has studied how different injuries to the inner ear might lead to hearing loss and balance dysfunction. “Collaborating with Dr. Hillary Snapp, chief of the Division of Audiology, we focused on firefighters in South Florida to understand how the hazardous and loud noises in their environment, such as alarms, firetruck engines and sirens, negatively impact their hearing and balance health long term,” he explained.

The team has developed a novel therapeutic approach to benefit not only firefighters and military and first responders, but also construction workers, musicians and others at risk of noise-induced hearing loss. Based on his findings and those accumulated from the literature, they have tested and designed a cold-therapy device resembling an audio headset that is FDA-registered as a Class I medical device and scheduled for clinical trials this year.

In partnership with Curtis King, an experienced developer of medical devices, “I have created a startup company called RestorEar Devices LLC, funded by the National Institutes of Health small business grants, and designed a line of products,” Dr. Rajguru added. He recalled having to learn how to generate intellectual property and patents, navigate FDA regulations, develop business plans, and understand consumer marketing and other aspects of bringing a product to market. “As a researcher, I had never been trained in any of this,” he said.

Dr. Rajguru is passing along the knowledge gained through his own experience. “Our goal is to increase the probability of success so that we have more improvements in human health,” he said. And, along the way, avoid the valley of death.



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You can play an essential role in advancing the University of Miami Miller School of Medicine to new levels of excellence in education and research by designating the school as a full or partial beneficiary of your IRA. Additionally, if you are 70½ years or older, you can transfer up to \$100,000 annually, indexed to inflation, from your IRA directly to the Miller School without having to pay income tax on the transfer. This is an easy way to satisfy all or part of your required minimum distribution.

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To learn more about making a planned gift, please visit us at miami.edu/plannedgiving or contact Kyle Paige, Executive Director, Office of Estate and Gift Planning, at 305-284-2914 | kpaige@miami.edu.

Giving

THE LIFE-CHANGING IMPACTS OF DONOR GENEROSITY | Profiles by Stacey Bomser

Visualizing a Bright Future

A new eye prosthetic gives a girl life-changing confidence and self-esteem

Sandra Arevello sees herself in a whole new light these days. Born with a small eye socket, or microphthalmia, the 11-year-old Naples, Florida, girl wears an eye prosthetic that needs to be replaced as she grows to ensure her orbital bones develop properly. Sandra received her last prosthesis when she was 7 and was long overdue for a replacement.

Self-conscious about how she looked with her ill-fitting prosthetic, Sandra had stopped socializing until Bascom Palmer Eye Institute, supported by a grant from the Naples Children & Education Foundation, provided her with a new one.

Sandra's mother credits Bascom Palmer and NCEF for restoring her daughter's health and self-confidence. "There are not enough words to explain how grateful we are," Sandra Lemus Peña said. "Without them, I would not have been able to get Sandra the help she desperately needed."

Sandra's case illustrates the impact NCEF's Vision Initiative has had on under-

privileged, at-risk children in Collier County. "When Bascom Palmer joined as a partner in 2020, we were able to expand our services to treat children with most acute eye care challenges," said Maria Jimenez-Lara, chief executive officer of NCEF. "This is in addition to the approximately 20,000 on-site vision screenings we provide each year to students in Title I schools, providing comprehensive eye exams and two pairs of glasses — one for home and one for school."

Sandra's optometrist at Bascom Palmer in Naples, Bailey Peterson, O.D., said these services are life-changing for children. "A lot of these families do not have insurance or access to vision care," Dr. Peterson said. "But because of this vital partnership with NCEF, we can provide children with care so that they have the best prognosis and an equal chance to succeed in life."

To support this partnership, email Amy Lane at alane@miami.edu.



Photography by Sonya Revell

The Ultimate Act of Altruism

Parents donate their son's brain tumor to advance cancer research

When Catherine and Andrew Prescott's son, Austen, was diagnosed with diffuse intrinsic pontine glioma, or DIPG, a rare and aggressive pediatric brain cancer, the Miami couple was told the only treatments were palliative. The parents were desperate to save their son, and Austen underwent two neurosurgeries, 40 rounds of radiation and four experimental chemotherapies through clinical trials. In the end, his tumor was too powerful, and he passed away last year at the age of 18.

That same tumor is now helping to find a cure for the devastating disease that took Austen's young life. In the ultimate act of altruism, the Prescotts donated their son's tumor to Sylvester Comprehensive Cancer Center, where neuro-oncologists Antonio Iavarone, M.D., and Anna Lasorella, M.D., experts in DIPG and other aggressive brain tumors, have been studying it.

"The Prescotts' selflessness is immeasurable," said Dr. Lasorella, a member of Sylvester and professor of biochemistry and molecular biology at the Miller School. "We cannot be more grateful to them. They care so much that they have given a piece of their child."

"With tumor tissue, we

can better understand what the mutations are, the alteration in the genome and DNA that transformed normal cells into cancer cells," said Dr. Iavarone, deputy director of Sylvester and professor of neurological surgery and biochemistry and molecular biology at the Miller School. "This is a crucial step in moving potential treatments forward."

To financially support the doctors' efforts, the Prescotts established Team 620. The 'CaneFunder name signifies Austen's birthday and the time of day when family and friends prayed for him throughout his cancer journey.

"Even in his lowest moments, Austen found empathy for others," Catherine Prescott said. "He didn't want other children to suffer. He always wanted them to have hope. We hope this fund in his honor will propel research, create clinical trials and lead us closer to a cure."



To support Team 620, scan here.



Honoring Her 'Angel'

A patient's planned gift supports pancreatic cancer research

After an attempted surgery at a South Florida community hospital, doctors diagnosed Kathleen Garafola with locally advanced, unresectable pancreatic cancer. Debilitated and devastated, she knew exactly what that meant. Garafola had already lost her mother, brother, sister and niece to the disease.

That was more than three years ago, and Garafola, now 68 and living in Pompano Beach, Florida, firmly believes she is here today — cancer-free — because of Jashodeep Datta, M.D., co-leader of the Gastrointestinal Site Disease Group at Sylvester Comprehensive Cancer Center. After Garafola had undergone nearly six months of chemotherapy, Dr. Datta, who is also associate director of translational research at the Sylvester Pancreatic Cancer Research Institute,

performed a challenging 10-hour surgery to remove the cancer.

"Dr. Datta is my angel. He took a chance on me when I was prepared for the absolute worst," said Garafola. "I've never met anyone so passionate about helping people. I believe deeply in his work and told him that I would do whatever I could to help him learn all he can about this disease and discover a cure."

To honor that pledge, Garafola arranged to make a planned gift bequeathing a generous portion of her and her late husband's estate to support Dr. Datta's research.

"We are at the forefront of discovery, zooming in on the inherited susceptibility of pancreatic cancers and understanding the molecular basis of sensitivity to both chemotherapy and immunotherapy," said Dr. Datta, who is the DiMare Family Endowed Chair in Immunotherapy. "We can then harness that information to offer novel drug combinations to make those responses even better."

To learn more about planned and estate giving, contact Megan Brahimi at m.brahimi@miami.edu.



Kathleen Garafola with her dogs, Myssi and George, who provided emotional support throughout her cancer journey.



Meet the DCC MVP

Alumnus is instrumental in Dolphins Challenge Cancer achieving record-setting donations for Sylvester

On February 24, more than 6,700 participants took part in Dolphins Challenge Cancer XIV, the Miami Dolphins organization's signature fundraising event, which has raised more than \$75 million since its inception. This year's walk, run and bicycle rides raised a record-setting \$12 million to support innovative cancer research at Sylvester Comprehensive Cancer Center.

Orchestrating the massive event is University of Miami alumnus Javier Sanchez. The DCC executive director is a double 'Cane, having earned a bachelor's degree in studio music and jazz studies and a master's degree in music business and entertainment industries. Sanchez is also a former adjunct professor at UM's Frost School of Music.

Sanchez is an accomplished trombonist, and his musical journey spanned hundreds of concerts in the jazz, classical and Latin genres at venues as highly regarded as Carnegie Hall. His transition from musician to event producer paralleled his increased involvement in Miami-based community events. He was the director for the Miami Marathon and worked with the Orange Bowl before joining the DCC team in 2018.

"It was a privilege to study an art form that is all about creating an emotional con-

nection with an audience," Sanchez said. "Similarly, the DCC is about replicating that same connection to better health and wellness within our community."

In addition to organizing the massive event, Sanchez leads by example. He participates in the 99-mile ride with his friend, Sebastian Strong Foundation Executive Director Oscar Ortiz, who lost his son, Sebastian, to cancer in 2016.

Sanchez also credits Sylvester Director Stephen D. Nimer, M.D., for giving him the motivation to improve his cycling.

"With Javier Sanchez serving as the figurative DCC team captain, Sylvester has been able to accelerate the pace of discovery and make great strides in our race toward a world without cancer," said Dr. Nimer, who is also the Oscar de la Renta Endowed Chair in Cancer Research and executive dean for research at the Miller School. "We couldn't be more grateful."



To learn more about the DCC, scan here.



JOIN US IN BUILDING A HEALTHIER, BRIGHTER WORLD

To support medical education, research, patient care and health equity, scan the QR code at left to visit the Ever Brighter Campaign website.

Remembering Riley

Father and daughter alumni create a fund to support pediatrics research and clinical initiatives

Riley Kogen never got the chance to realize her legacy of becoming a Hurricane and follow in the footsteps of her mother, Ali Nathan, B.Sc. '03, and grandfather, Bob Denholtz, B.B.A. '71. Riley passed away a decade ago, at only 5 years of age, from panhypopituitarism, a rare condition that affects the production of hormones in the pituitary gland.

Hoping to prevent other families from experiencing similar heartbreak, her family created Riley's Dance Fund. It supports neonatal genomic research and clinical palliative care initiatives in the Miller School's Department of Pediatrics.

"As proud alumni, we gravitated toward our roots to make an impact," said Denholtz, who serves on UM's President's Council. "We want to honor Riley's legacy and have her name mean something on campus."

Their philanthropy supports the groundbreaking work of Pankaj Agrawal, M.D., chief of the Division of Neonatology.

"We like what Dr. Agrawal is doing with genomics and where he's headed with his medical research," Nathan said. "Riley was born with a rare, congenital condition, so this is something we can relate to and appreciate the advances he is making."

"Riley's Dance Fund

will help us uncover the underlying genetics of rare and orphan diseases," said Dr. Agrawal, Project New Born Distinguished Chair in Neonatology and professor of pediatrics and genetics at the Miller School. "With a better understanding of the mechanism of disease, we can try to find treatments and help families desperate for answers."

That aligns perfectly with Riley's Dance Fund's mission.

"Our ultimate goal is to create a brighter future for families," Nathan said. "We want to see other children dance again, just like Riley."



To support Riley's Dance Fund, scan here.

Collin Lenton



Alumni News

HOW MILLER SCHOOL OF MEDICINE GRADUATES ARE TRANSFORMING LIVES | Profiles by Debby Teich



Dr. Geeta Nayyar believes technology can empower physicians and patients.

What the New Digital Era Means for Physicians

Dr. Geeta Nayyar sees the next generation as being both health care informers and influencers

Arheumatologist by training, Geeta Nayyar, B.S. '99, M.D. '03, M.B.A., is a nationally recognized leader in health technology who has been bridging the gap between clinical medicine, the business sector and digital health. She consults for several influential medical organizations and lectures on topics such as emerging health tech, artificial intelligence,

digital health and the business of health care. She recently published *Dead Wrong: Diagnosing and Treating Healthcare's Misinformation Illness*, which examines the rise of medical misinformation in the digital age. We talked to Dr. Nayyar about her experiences at the Miller School and beyond.

What inspired you to write your book?
Disinformation and misinformation have always created confusion around science, but social media and AI are now spreading it more quickly. Truth and fiction are often

“Medical students should be ready to meet the changing needs of consumers who are expecting more from health care.”

indistinguishable. The health care industry must embrace the rapidly evolving digital landscape by disseminating accurate and comprehensive information to improve health literacy, advance strategic business goals and protect the patient-physician relationship. This will empower patients, health care professionals and policymakers.

How will your book help medical students?
Medical students should be ready to meet the changing needs of consumers who are expecting more from health care. In this new era of technology, doctors don't just need to inform, they also need to influence. They must understand how to use technology and marketing to help build their practices and create their own brands. I hope that my book will help the next generation of physicians prepare for their future careers.

STAY IN TOUCH!
Send us a note at alumni@med.miami.edu and keep your classmates up to date on what you are doing.

How did the Miller School set you up for success?
In addition to exceptional medical training, the Miller School provided me with opportunities to explore career paths outside of clinical and academic medicine. I had amazing mentors, including Drs. Alex and Hilit Mechaber, who guided me in medical school and throughout my entire journey.

Are you still involved with the Miller School?
I am currently on the board of the Medical Alumni Association and give talks to medical student organizations. I also volunteer for the Wolfson DOCS program, which is how I met Sneha Akurti, a first-year Miller School medical student who, along with my daughter, Sonia, illustrated my book.

Why should alumni support the school's future?
It is important that we pay it forward. We have tremendous talent at the Miller School, and we all benefit when we rise as a community to make the future better for the school and the medical community. There are so many fulfilling ways to help.

Save the Date

Medical Alumni Weekend
March 7–9, 2025

We look forward to celebrating Medical Alumni Weekend 2025 with the Classes of 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010 and 2015 in Miami.

We are looking for volunteers who can help lead reunion efforts in 2025. If you would like to become involved in your class, please contact alumni@med.miami.edu.

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- Emily Eachus, M.D. Candidate, Class of 2025
- Gemma St. Louis, M.D./M.P.H. Candidate, Class of 2024

For more on the MAA, visit med.miami.edu/alumni.

Preparing Students for the Future of Medicine

As AI changes health care, Dr. Gauri Agarwal is adapting the curriculum to ensure medical students are ready

Gauri Agarwal, B.S. '96, M.D., '00, an associate dean for curriculum at the Miller School, believes that nothing will impact medicine more in the next 10 years than artificial intelligence. To help bridge the gap, Dr. Agarwal has been integrating AI and the humanities into the curriculum to help students understand how to leverage the technology to improve patient care and outcomes.

"We must teach our medical students to adapt to AI by offering patients the humanistic and compassionate care that a machine cannot provide," Dr. Agarwal said. "They can use empathy, instinct, creativity and contextual understanding to connect with patients."

Dr. Agarwal became interested in academia at an early age. Her father is a professor of mechanical engineering, and her mother is a pediatrician. She chose a career that blends both.

"By combining medicine and education, I can have a deeper impact on patients and society by developing future physicians," she said.

As an educator, Dr. Agarwal's goal is to ensure students are inspired, challenged and empowered to become transformational leaders in medicine. This is evident in her teaching style and the curriculum she



Humor and empathy are critical teaching tools in Dr. Gauri Agarwal's classes.

leads. "During medical school, I received invaluable clinical training that emphasized patient-centered care," she said. "Our health

"Medical students ... must always remember that the core of what we do is a uniquely human enterprise that requires warmth, curiosity and judgment."

system provides rare opportunities for students that are not available at many other health systems."

She uses humor and empathy in her

classroom to create an open space for her students. "Medical students are learning in a fast-paced, stressful environment," Dr. Agarwal said. "If they are relaxed, they will be more comfortable asking questions."

She was recently honored as a Gold Humanism Scholar for her work developing a curriculum that incorporates the humanities and AI's key applications in clinical practice.

"Music is one element of the humanities that can be incorporated into a medical curriculum to enhance creativity and well-being," she said. "I love my work and look forward to continuing to adapt the curriculum as health care evolves. Medical students need to develop adaptive expertise as they integrate new technology into the care of their patients, but they must always remember that the core of what we do is a uniquely human enterprise that requires warmth, curiosity and judgment."

Jeffery Salter

Scholarship Adds to Family Legacy

Dr. Paul Sygall, and his wife, Stacy, endow a scholarship in gratitude for the support he received as a medical student

Paul Sygall, B.S. '92, M.D. '95, not only earned his degrees at the University of Miami, but also did his residency and fellowship at the University of Miami/Jackson Health System. In gratitude to the U for providing opportunities when he was a student, he and his wife, Stacy, are paying it forward by establishing the Sygall Family Endowed Medical Scholarship at the Miller School. The scholarship will be awarded to academically gifted medical students who

have an interest in serving the community.

"My academic scholarship opened doors by easing the financial burden when I was a student," said Dr. Sygall, an anesthesiologist in Greenwich, Connecticut. "We want to do the same for promising medical students who face financial hurdles."

He credits the education and training he received at the UM/Jackson Health System with providing a solid foundation for his career. His interest in anesthesia was piqued when he studied under George Bikhazi, M.D.,

who at the time was head of pediatric anesthesiology at Jackson Memorial Hospital and clinical research in the Miller School's Department of Anesthesiology, Perioperative Medicine and Pain Management.

"We treated a large volume of diverse patients who suffered from many of the diseases we were researching and studying," Dr. Sygall said. "My training prepared me to work in practically any condition or situation.

"It is very rewarding to make patients feel safe and comfortable when they are in an extremely vulnerable state," he added.

The endowed scholarship cements the

"It is a humbling experience to make a difference in the lives of others."



Dr. Paul Sygall and wife Stacy have a passion for helping others in their community and at UM.



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Sygall family's long-standing legacy at the U. Their daughter, a UM graduate, is currently a student at the School of Law, and their son is an undergraduate. The Sygalls have provided financial support throughout the University for nearly two decades, and their endowed scholarship will allow them to make a more profound impact at the Miller School.

It also supports the Sygalls' passion for giving back to their community. Dr. Sygall has educated teens on the dangers of vaping, and Stacy Sygall has helped distribute financial assistance for college to underserved students.

"It is a humbling experience to make a difference in the lives of others," said Stacy Sygall. "We hope the scholarship will help them fulfill their dreams."

Enduring Bonds

Reunion weekend offered a chance for alumni to reconnect

Hundreds of alumni from across the country returned to campus March 1–3 for Medical Alumni Weekend 2024.

The festivities began Friday evening with the Miller School Alumni Association Hall of Fame induction ceremony. Jeffrey Jacobs, M.D. '88, professor of surgery and a cardiac surgeon at the University of Florida, is the 31st alumnus to receive the Hall of Fame honor. The prestigious award is presented to alumni who have achieved national or international recognition for their impact on the medical profession.

Henri R. Ford, M.D., M.H.A., dean and chief academic officer, spoke passionately about the crucial role alumni play in elevating the Miller School to national prominence. “You are living proof of the amazing effects of the quality of the education that the Miller School provides,” he said.

On Saturday night, Superblue Miami was the setting for another event as alumni and guests took in the museum’s immersive, interactive exhibits while enjoying hors d’oeuvres and cocktails.

The weekend culminated with a special Sunday brunch at Lowe’s Coral Gables for those whose classes celebrated a milestone year.



To see more photos from Medical Alumni Weekend, scan the code here.



1. Dag Shapshak, M.D. '99, and Rachel Dawkins, M.D. '04
2. Suzanne Minor, M.D. '99; Elizabeth Alvarez Connelly, M.D. '99; and Marva Agrawal, M.D. '99
3. Trisha Rothenberg Roth, M.D. '69; Marvin Byer, M.D. '69; Jose Birriel, M.D.; M. Pilar Gutierrez, M.D. '90; Norman Shorr, M.D. '69; James Gamble, M.D. '74; Jared Gans M.D. '15; Melissa Gans, M.D. '15; Sabrina Taldone, M.D. '14; and Wilfredo Gonzalez, M.D. '14 and his family
4. Michaela Straznicka, M.D. '94; Jenny Wu, M.D. '90; Mimi Lee M.D. '94; Patricia Delgado, M.D. '94; Albert Titus, M.S. '94; Alex Mechaber, M.D. '94; Alan Bassin, M.D. '94; Robert Martinez M.D. '94; Aimee Monica Aguiar, M.D. '94; Roger Blake, M.D. '94; and Patricia Tager, M.D. '94
5. M. Pilar Gutierrez, M.D. '90; University of Miami President Julio Frenk; Jeffrey Jacobs, M.D. '88; Miller School of Medicine Dean Henri Ford, M.D., M.H.A.; and Alberto Mitrani, M.D. '84
6. Alumni enjoying the photo booth at the Reunion Celebration at Superblue Miami
7. Janet Falcone, wife of Steven F. Falcone, M.D. '87
8. Susan Snodgrass, M.D. '84, and guest Jonathan Sloss
9. Alumni and guests getting reacquainted at the Welcome Reception



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Class Notes

John T. Adams, M.D. '63, an internal medicine physician, was on staff at Biloxi VA Medical Center in Biloxi, Mississippi. He retired in 1998 and lives in Pinetta, Florida.

Ellen Sayet, M.D. '67, was honored by Lee Health in Southwest Florida during Women's History Month in March for her pioneering contributions to medicine. Dr. Sayet was the first female physician at Lee Health and helped establish the first oncology unit at the hospital. She retired in 1984.

Philip Villanueva, M.D. '67 was named a Trusted Healthcare Professional by The Inner Circle for his contributions to the field of neurosurgery. Dr. Villanueva is director of neurotrauma and critical care at Temple University Hospital in Philadelphia and a professor of clinical neurosurgery at the Lewis Katz School of Medicine at Temple University. A specialist in neurotrauma and neurocritical care, he completed his residency and fellowship at UM/Jackson Memorial Health System and is a member of the Iron Arrow Honor Society.

Paul Wetter, B.S. '71, M.D. '75, was a pioneer in advanced laparoscopic surgery. He is a clinical professor emeritus of OB-GYN at the Miller School and chairman emeritus of the Society of Laparoscopic and Robotic Surgeons.

Roy Elterman, M.D. '74, will receive the Child Neurology Society's 2024 Roger and Mary Brumback Memorial Lifetime Achievement Award in recognition of a lifelong commitment to child neurology, patient care and humanism in medicine. He retired from clinical practice in 2011 and is currently the president of the Pediatric Epilepsy Research Foundation in Dallas.

Robert Shesser, M.D. '76, recently made his Grand Rounds presentation to the University of Miami/Jackson Health System Emergency Medicine Residency Program. Dr. Shesser is chair of the emergency medicine department at George Washington University.

Alan Matarasso, M.D. '79, a plastic surgeon, is a clinical professor of surgery at Northwell Health System/Hofstra University, Zucker School of Medicine. He is a member of UM's President's Council and president-elect of the Plastic Surgery Foundation.

Roderic Pettigrew, M.D. '79, Ph.D., a trail-blazer in magnetic resonance imaging, currently serves as CEO of EnHealth and executive dean for EnMed at Texas A&M University.

Robert Carr, M.D. '81, and **Steven F. Falcone, B.S., '83, M.D. '87, M.B.A., '04**, recently participated on a virtual panel with students enrolled in the Miller School's dual M.D./M.B.A. program. Dr. Carr is chief medical officer for Kumanu, a precision well-being technology company, and an executive performance coach with the Johnson & Johnson Human Performance Institute. Dr. Falcone is professor and associate chair of radiology at the Miller School.

Steven J. Barker, M.D. '81, Ph.D., professor emeritus in the Department of Anesthesiology at the University of Arizona in Tucson, was a Friend of Foundation for Anesthesia Education and Research honoree in October 2023.

Clara Milikowski, M.D. '83, UM/Jackson Pathology Resident '87, UM/Jackson Pathology Fellow '88, is a clinical professor in the Miller School's Department of Pathology and Laboratory Medicine.

David C. Rosenberg, M.D. '88, a family medicine practitioner, is founder/owner of Jupiter Concierge Family Practice in Jupiter, Florida. He obtained certification in functional medicine through the Institute for Functional Medicine in 2022.

Jonathan Reich, M.D. '92, recently published *A Convenient Villain, Charles A. Lindbergh's Remarkable and Controversial Legacy Preparing the U.S. for War*. Dr. Reich is pediatric cardiologist in Maryland who has been recognized for his role in developing a lifesaving screening technique to detect congenital heart disease in newborns.

Kalman Blumberg, M.D. '94, is an orthopaedic surgeon and spine specialist at Holy Cross Medical Group in Fort Lauderdale, Florida.

Karen Laszlo Keller, M.D. '94, is the owner of Peninsula Dermatology in Burlingame, California, and has practiced there for more than 25 years.

Christopher Ward, M.D. '95, M.B.A., an emergency medicine specialist, is chief medical officer at Methodist Hospital Northeast in San Antonio, Texas.

Adrian Burrowes, M.D. '00, UM/Jackson Family Medicine Resident '03, is CEO of CFP Physicians Group in Casselberry, Florida. He is on the list of Castle Connolly 2024 Top Black Doctors.

Laszlo Balazs, M.D., UM/Jackson Anesthesiology Resident '04, is an anesthesia attending at HCA Florida Aventura Hospital in Miami.

Lauren Meshkov Bonati, M.D. '13, UM/Jackson Internal Medicine Resident '14, a dermatologist and co-owner of Mountain Dermatology Specialists, has been living and working in Vail, Colorado, for the past six years.

Sumit Mehta, M.D. '16, joined the Cottage Gynecologic Oncology Clinic in Santa Barbara, California. He specializes in obstetrics and gynecology, with a focus on gynecologic oncology.

Louis Cai, B.S. '14, M.D. '18, Bascom Palmer Eye Institute Vitreoretinal Surgical Fellowship, and **Riya Fukui, M.D. '18**, founded Cosign AI to enhance health care provider efficiency, allowing more time for patient care without sacrificing quality.

Stuart Sacks, B.S. '14, M.D. '18, is an assistant professor of clinical anesthesiology and critical care at the Hospital of the University of Pennsylvania in Philadelphia.

Meghan Jannette, M.D./M.P.H. '20, is a pediatrician in private practice at Beverly Hills Pediatrics in Beverly Hills, California.

Jacqueline Baikovitz, M.D./M.P.H. '21, an internal medicine resident at the Cleveland Clinic Lerner College of Medicine (PGY3), will complete a rheumatology fellowship at Emory School of Medicine. She was selected to join the 2024-25 National ACP Council of Resident/Fellow Members.

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A cancer specialist describes why good doctors are good storytellers | By Mikkael A. Sekeres, M.D., M.S.

One Physician's Story



I've always thought that medicine is inherently about storytelling, and one of the great privileges we have as health care providers is soliciting the stories of other people's lives. Through my patients, I have learned what it's like to work in steel mills and apiaries, as airplane pilots and policemen, or as truck drivers and teachers. I have vicariously stepped into the boxing ring at Madison Square Garden, flown to outer space, witnessed the Cuban missile crisis on a naval warship and fled Cuba during the Mariel boatlift.

I guess I come by it honestly: I was born and bred in Providence, Rhode Island, and I come from a family of English majors. My dad was a journalist — a reporter, and later an editor, for the *Providence Journal Bulletin*.

I remember going out to parties when I was in high school. I'd come slinking home and not want to divulge any information about what had transpired during the past few hours. But my dad, the reporter, would pepper me with questions: "What was the house like when you walked through the door? Where was the living room? Where was the kitchen?

What kind of food did they serve? Was there any dancing?" He'd continue until he could picture the scene as if he were there.

That's really what we do when we meet patients for the first time. Like journalists, we try to elicit facts to imagine our patients' varied lives and eventually tell a clear story of their illness. The better we are at storytelling, the better doctors we become. If the story fits into a logical pattern, we often can arrive at a diagnosis, and then we tell the story of how to treat the illness.

But as a hematologist-oncologist, I also recognize that I'm an unwelcome guest. My patients don't want to have a story of cancer. An important part of my job, then, is to both honor their story and recognize their heroism as they go on this unwanted journey with me by their side.

Also, like a journalist, I learned that the best way to talk to a patient is to meet them where they are, and not hide behind the armor of medical vernacular. I learned this with my own parents. During my residency training, I was talking to them on the phone describing some medical esoterica when they stopped me in my tracks. "Why are you using these terms?" they asked. "It's us, your parents. Why don't you speak to us like you always did?" So, I began trying to relate to my patients on their level and talk to them the way I would my own family. It helped me better understand their stories. It made me better at telling my own stories. And it made me a better doctor. 🎧

Mikkael A. Sekeres, M.D., is professor of medicine at the Miller School and chief of the Division of Hematology at Sylvester Comprehensive Cancer Center. He is also a widely published essayist. This was adapted from an Inside U Miami Medicine podcast discussion with Miller School Dean Henri R. Ford.



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