



SOMnews

What's on My Mind...



...is the 2017 State of the School Address, "Transforming the Trajectory of Medicine," and the incredible progress we have made over the course of our 210-year history.

achieve their current status of excellence. The second video was a review of our incredible accomplishments in 2017, acknowledging the key highlights across all our mission areas. The final video shared testimonials from individuals whose lives have been deeply impacted by the School of Medicine.



For the last three centuries, our academic community has done an exceptional job of providing excellence in biomedical education, basic and clinical research, as well as state-of-the-art expertise and compassionate patient care and service.

We have done this to improve the health and well-being of the citizens of the State of Maryland, our nation, and the world.

The annual State of the School address celebrates only a small sample of the collective progress we have made. These examples illustrate what happens when we set our sights on valiant outcomes and not on temporary obstacles.

This year's address marked a major milestone. Not only did we commemorate our 210th anniversary, but the presentation was a sharp departure from the format we've used in the past. For those who could not attend this year, the State of the School address was presented via a video tour, which recognized the high points and key milestones from 2017, as well as throughout our school's amazing 210-year history.

The first video showed the rich history of the School of Medicine, and recognized the amazing men and women who helped to forge the path to our current successes. The video captured how certain discoveries and innovations, which were developed in the School of Medicine during its first and second centuries, have progressed over time to

I am deeply moved by the progress we have made, and I believe you will be inspired by the depth and breadth of our work, and the impact we have made on human health and well-being. However, now is not the time to rest on our laurels. While we respect those whose hard work gave us the stellar reputation we have today, the best way to honor them is to follow in their successful footsteps.

It is because we are undaunted in our purpose and resilient in our execution that I am so optimistic and confident about the progress we will continue make in the future. Each year we have soared higher than the year before. The tradition of talented students and teachers coming to our great institution ensures that there are no limits to what we might accomplish using our imaginations and our wonder and discovery. Our success story is one that will continue to be told for years to come.

In the relentless pursuit of excellence, I am
Sincerely yours,

E. Albert Reece, MD, PhD, MBA

Executive Vice President for Medical Affairs, University of Maryland
John Z. and Akiko K. Bowers Distinguished Professor and
Dean, University of Maryland School of Medicine



Point of Pride

Dr. John Crawford, an early UMSOM faculty member who taught Natural History, correctly predicted, for the first time, a relationship between insects and human illness.

He went on to be among the first to administer a viral vaccine for smallpox.

What's New...

SOMnews has now expanded to eight pages, with more information and special sections on Research & Discovery, Clinical Care, Academic Innovations, and Community Impact.

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IN PRINCE GEORGE'S COUNTY

A Groundbreaking Event for Maryland Medicine



Call it a transformative step in the growth of the University of Maryland School of Medicine (UMSOM) and the University of Maryland Medical System (UMMS).

On November 30, 2017, top leaders from government, business, and the university gathered in Largo, Maryland, for a ceremony marking the groundbreaking of the new University of Maryland Capital Region Medical Center. The advanced medical complex, the 14th hospital in the UMMS network, is expected to open in 2021.

"This groundbreaking marks a tremendous moment in our vision to bring world-class discovery-based medicine to Prince George's County and the surrounding region," notes UMSOM Dean E. Albert Reece, MD, PhD, MBA, who is also Executive Vice President for Medical Affairs, University of Maryland, and the John Z. and Akiko K. Bowers Distinguished Professor.



Robert A. Chrencik, MBA, CPA, President and Chief Executive Officer, University of Maryland Medical System, agrees.



This marks an important step in the journey to better serve the health care needs of Prince George's County."

— Robert A. Chrencik, UMMS President and CEO

"In partnership with the University of Maryland School of Medicine, we are making great strides in improving health care delivery, and we are energized and inspired to build a premier health care facility about which all Marylanders can be proud. We are also witnessing an exemplary public-private partnership as UMMS invests significant resources into this project alongside our partners from the State and Prince George's County. UMMS is proud to help fuel the economic engine of this region and become increasingly integrated into the fabric of this vibrant community as an employer, care provider, and civic partner," Chrencik adds.

State of the Art Facility

Costing \$543 million, the new 600,000-square-foot, state-of-the-art facility will bring much-needed quality health care to residents of Prince George's County. Located on a 26-acre site adjacent to the Arena Drive exit off Interstate 495, UM Capital Region Medical Center will include:

- An 11-level main patient care tower
 - Two roof-top helipads
 - 205 private inpatient rooms
 - 20-bed Adult Observation / Short Stay treatment area
 - 45-bay Emergency Department
 - Eight operating rooms
 - 15-bed specialty pediatric hospital operated by Mt. Washington Pediatric Hospital (co-owned by UMMS and Johns Hopkins Medicine)
- The project is also slated to include an ambulatory care center and medical office space.

Core clinical programs and specialty centers include, among others, the second busiest trauma center in the State and the only neonatal intensive care unit (NICU) in Prince George's County and Southern Maryland:

- Level II Trauma Center
- Level III Neonatal Intensive Care Unit
- Cardiac STEMI / Cardiac Surgery Center
- Designated Stroke Center
- Cancer Program
- Critical Care Medicine
- Emergency Services
- Neurosciences
- Orthopaedics
- Women's Services

The Power of a New Partnership

The vision that led to the creation of the new medical center came about almost a decade ago. In 2010, partners including Prince George's County, the state of Maryland, the University System of Maryland, the University of Maryland Medical System, and Dimensions Healthcare System formally initiated discussions about the future of health care, leading to a Memorandum of Understanding signed in 2011 to develop a comprehensive plan for strengthening health care in the county. The University of Maryland School of Public Health conducted a public health impact study in 2011, *Transforming Health in Prince George's County, Maryland: A Public Health Impact Study*, with findings including:

- Prince George's residents suffered from higher rates of chronic diseases including diabetes, heart disease, hypertension, asthma, and cancer than residents residing in neighboring counties;
- The County had significantly fewer health care providers for its population than neighboring counties and the state and capacity of its community-based care was severely limited; and
- Many residents sought health care outside of Prince George's, a phenomenon known as "outmigration."

In September 2017, the University of Maryland Capital Region Health (UMCRH) was established upon the formal affiliation of the University of Maryland Medical System and the former Dimensions Healthcare System. UMCRH presently is focusing on several key strategic priorities, including:

- Expanding access for primary/community care, specialty care, and other health care services to the region to reduce health care disparities and improve health status;
- Facilitating investment in outpatient practices and health education programs to manage chronic diseases;
- Broadening access to discovery-based medicine;
- Attracting residents of Prince George's County and Southern Maryland region who now receive care from hospitals outside the County.

In addition, UMCRH operates the University of Maryland Prince George's Hospital Center in Cheverly, University of Maryland Laurel Regional Hospital, University of Maryland Bowie Health Campus, and the University of Maryland Family Health & Wellness Center in Suitland. In addition, UMSOM faculty direct several UMCRH clinical programs, including anesthesiology, critical care, emergency medicine, neonatology, orthopaedics and vascular surgery, and the State's second-busiest Trauma Center. UMSOM faculty also lead the highly-regarded cardiac surgery program at UM Prince George's Hospital Center.

"Today we see the future within reach, and express our deep gratitude to the many individuals and entities who have played a role in bringing us this far on our mission." says Bradford Seamon, Chairman of the Board of Directors of University of Maryland Capital Region Health. *"The thousands of employees of UM Capital Region Health stand willing, ready and able to help drive the transformation of health care delivery across our current facilities as we envision our new regional hub in Largo rising on the horizon."*

"We believe this state-of-the-art facility at UM Capital Regional Medical Center is critical to our enterprise," agrees Dean Reece. *"But, most importantly, it is an incredible asset for the citizens of Prince George's County."*

"Now...more than 1 million people...will finally get the hospital they deserve, and they will have access to some of the best doctors, nurses, and health care professionals in the entire world."

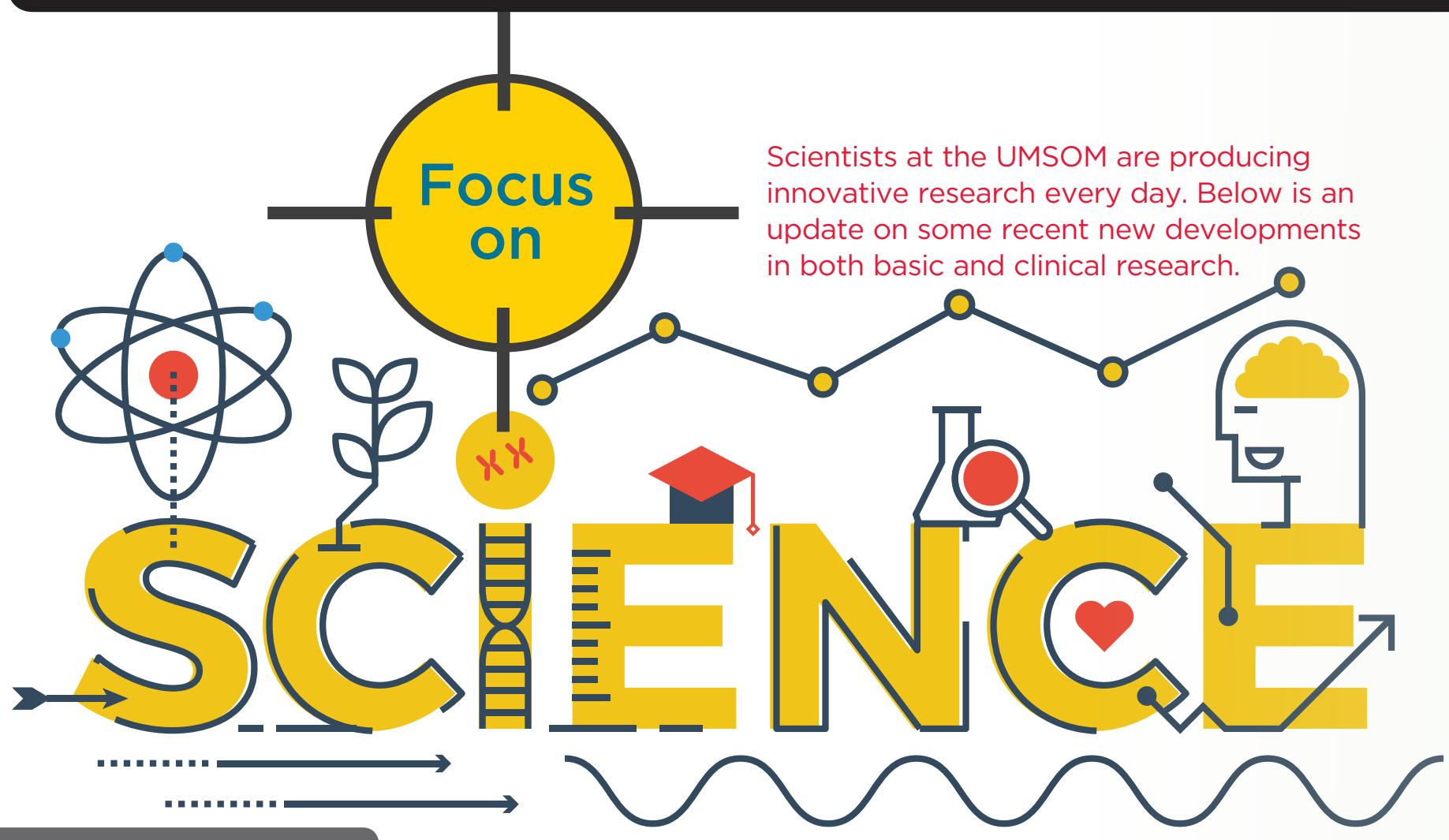
— Governor Lawrence 'Larry' Hogan Jr.



UNIVERSITY OF MARYLAND CAPITAL REGION MEDICAL CENTER



For more information about the new University of Maryland Capital Region Medical Center, visit UMCapitalRegion.org/our-new-hospital. For philanthropic support, visit UMCapitalRegionFoundation.org



OTORHINOLARYNGOLOGY



Scientists Identify the First Brain Cells to Respond to Sound

A new study by UMSOM scientists, along with colleagues at the University of Maryland College Park, is the first to identify a mechanism that could explain an early link between sound input and cognitive function, often called the "Mozart effect." Working with an animal model, the researchers found that a type of cell in the brain's primary processing area during early development, long thought to have no role in transmitting sensory information, may conduct such signals after all.

The results, published in the *Proceedings of the National Academy of Sciences*, is the first to suggest that early in brain development, sound becomes an important sense. Working with young ferrets, **Amal Isaiah, MBBS, DPhil**, assistant professor of otorhinolaryngology at UMSOM and Patrick Kanold, PhD, a professor of biology at University of Maryland,

Scientists at the UMSOM are producing innovative research every day. Below is an update on some recent new developments in both basic and clinical research.



College Park, observed sound-induced nerve impulses in subplate neurons, which help guide the formation of neural circuits in the same way that a scaffolding helps a construction crew erect a new building. This is the first time such impulses have been seen in these neurons. During development, subplate neurons are among the first neurons to form in the cerebral cortex — the outer part of the mammalian brain that controls perception, memory and, in humans, higher functions such as language and abstract reasoning.

By identifying a source of early sensory nerve signals, the current study could lead to new ways to diagnose autism and other cognitive deficits that emerge early in development. Early diagnosis is an important first step toward early intervention and treatment.

RADIATION ONCOLOGY



Scientists to Begin Critical Radiation Countermeasures Research

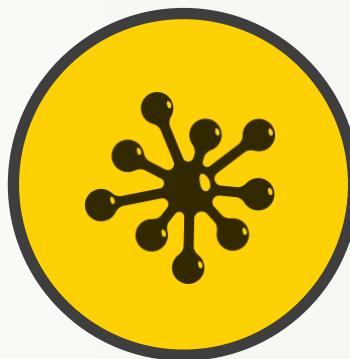
UMSOM researchers have been awarded a contract worth up to \$9.7 million over three years from the U.S. Biomedical Advanced Research and Development Authority (BARDA) to study new ways to treat radiation-induced bleeding disorders. BARDA is part of the Office of the Secretary for Preparedness and Response in the U.S. Department of Health and Human Services.

The principal investigators on the project are **Isabel L. Jackson, PhD**, assistant professor in the Department of Radiation Oncology and director of the Medical Countermeasure Program in the department's Division of Translational Radiation Sciences (DTRS), and **Zeljko Vujaskovic, MD, PhD**, professor of Radiation Oncology and Director of DTRS.



The two researchers will examine the effectiveness of several medications in preventing or reducing bleeding disorders that can occur after radiation exposure in a radiological or nuclear incident. Radiation often harms blood cells and circulatory system tissue, and as a result, people exposed to radiation are at high risk of bleeding to death. The drugs being tested are approved by the U.S. Food and Drug Administration for treatment of bleeding in trauma settings.

Medical countermeasure studies can also improve treatment of patients undergoing radiation treatment for a variety of cancers. About 60 percent of diagnosed cancer patients receive radiation therapy during treatment.



Scientists Identify Key Factors That Help Microbes Thrive in Harsh Environments



IMET

Three new studies by UMSOM scientists have identified key factors that help microbes survive in harsh environments. The results, which have implications for biotechnology and understanding life in extreme conditions, appeared in the *Proceedings of the National Academy of Sciences (PNAS)*, *Astrobiology*, and the *International Journal of Astrobiology*.

The principal author on the studies is **Shiladitya DasSarma, PhD**, professor at the Institute of Marine and Environmental Technology in the UMSOM Department of Microbiology and Immunology. Co-authors on the papers include **Victoria Laye**, a PhD student in the MEES Graduate Program, and **Priya DasSarma, MS**, laboratory research supervisor in the DasSarma laboratory at the Institute of Marine and Environmental Technology in the UMSOM Department of Microbiology and Immunology. The work was supported by NASA.

The PNAS article focused on a microbe called *H. lacusprofundi* (Hla), from Deep Lake, a very salty lake in Antarctica. The scientists wanted to find out how proteins from the microbe function in very salty, very cold environments. They focused on one enzyme, beta-galactosidase, and discovered key differences between versions of the enzyme in Hla and versions in microbes that live in temperate environments. Among the key

differences: looser packing of atoms and greater flexibility in cold-functioning enzymes.

Another study, published in *Astrobiology*, expands the study by examining the role of enzymes in the microbe's ability to survive in the presence of toxic salts. This research has implications for decontamination of toxic environments, as well as life on other planets such as Mars, where these toxic salts, particularly one called magnesium perchlorate, have been identified on the surface.

The third study, published in the *International Journal of Astrobiology*, showed that Hla and other similarly hardy microbes can survive trips into the stratosphere, many miles above the Earth's surface, where conditions are similar to those on Mars. The stratosphere is extremely cold, has little oxygen, and has high levels of damaging ultraviolet radiation.

These studies also have the potential to be useful for biotechnology. For example, modified beta-galactosidase can be used for making lactose-free milk in cold temperatures, and other enzymes can be tailored for other "green" industrial processes at reduced temperatures, reducing the energy required for manufacturing.



Scientists Find That Traumatic Brain Injury Causes Intestinal Damage



Researchers have found a two-way link between traumatic brain injury (TBI) and intestinal changes. These interactions may contribute to increased infections in these patients, and may also worsen chronic brain damage. This is the first study to find that TBI in mice can trigger delayed, long-term changes in the colon and that subsequent bacterial infections in the gastrointestinal system can increase posttraumatic brain inflammation and associated tissue loss. The findings were published recently in the journal *Brain, Behavior, and Immunity*.

The lead researcher is **Alan Faden, MD**, the David S. Brown Professor in Trauma in the Departments of Anesthesiology, Anatomy & Neurobiology, Psychiatry, Neurology, and Neurosurgery at UMSOM, and director of the UMSOM Shock, Trauma, and Anesthesiology Research Center. Other authors of the paper include **Elise Ma**, a doctoral student; **Terez Shea-Donahue**

PhD, professor of radiation oncology; **Bogdan A. Stoica, MD**, associate professor of anesthesiology; and **David Loane, PhD**, associate professor of anesthesiology.

Researchers have known for years that TBI has significant effects on the gastrointestinal tract, but until now, scientists have not recognized that brain trauma can make the colon more permeable, potentially allowing harmful microbes to migrate from the intestine to other areas of the body, causing infection. People are 12 times more likely to die from blood poisoning after TBI, which is often caused by bacteria, and 2.5 times more likely to die of a digestive system problem, compared with those without such injury.

A Powerful Research Engine: UMSOM's Graduate Program in Life Sciences

The increasing scope of research conducted at the University of Maryland School of Medicine (UMSOM) would not be possible without the contributions of research fellows, trainees and students in the Graduate Program in Life Sciences (GPILS), who often serve as the “engine” that powers much of that research.

GPILS graduate programs cover the entire range of biomedical research, from the basics of protein structure and molecular biology, through integrative systems physiology, virology, and vaccine development up to behavior, cognition, population based genetics, and the impact of the environment on human health. GPILS programs place a special emphasis on the importance of translational research. During Fiscal 2017, GPILS students had 79 research papers that were published in major medical and research publications. During the year, GPILS students were awarded 22 grants with total award value of \$1,240,393, while postdoctoral fellows were awarded 13 grants with a value of \$589,252.

Every year, students in the GPILS program are awarded for their research, which spans across various departments and disciplines within the UMSOM.



“This year, our students and postdoctoral scholars have excelled in research and have published some landmark studies.”

— Dudley Strickland, PhD, Associate Dean for Graduate & Postdoctoral Studies and Director of the Center for Vascular & Inflammatory Diseases

GPILS AWARDS

PhD Scholar Award

Nathan Roberts, *Molecular Medicine*

During his years in the Molecular Medicine Program at UMSOM, Nathan Roberts has published three papers, and he received a perfect score on the National Institutes of Health individual training grant he submitted for his research focusing on treatments for glioblastoma, the most common and deadly form of brain cancer. As a student in the Translational Therapeutics Research Group, Mr. Roberts is using advanced nanoparticle drug formulations to improve the delivery of immunomodulatory drugs.

Alumnus of the Year

Benjamin Prosser, PhD, *Perelman School of Medicine, University of Pennsylvania*

Dr. Prosser was an extraordinarily successful graduate student and postdoctoral fellow at UMSOM. As a student, he published 10 papers on imaging muscle cells and graduated in only four years. As a postdoctoral fellow, he published an additional 10 papers on imaging and measuring

heart cells, was granted a patent, and was awarded a prestigious K99/R00 grant from NIH. Since becoming a faculty member at the University of Pennsylvania, Dr. Prosser has continued his impressive career in studying heart stretch, with publications in both *Science* and *PNAS*, in addition to receiving his first RO1 grant from NIH.

Postdoc Mentor of the Year

Joseph S. Cheer, PhD, *Professor, Anatomy and Neurobiology*
As a current and previous mentor of a number of postdoctoral fellows at UMSOM, Dr. Cheer has always extended the needed resources and opportunities for them to grow and succeed. He has helped them publish often and in prestigious journals, while assisting them in preparing and submitting grants that were successful at getting funded.

Elaine Miye Otani Award

Jeffrey Freiberg, PhD, *Molecular Microbiology and Immunology*

Dr. Freiberg has excelled both in his academic and research endeavors, and in his service to UMSOM and the greater community. His success as a researcher on *S. pyogenes*, which causes strep throat and other serious infections, led to five publications as a graduate student, with six more in the pipeline. In addition to his work in the lab, he leads a journal club and serves on the Medical Scientist Teaching Program Student Council, to name just a few of his many service activities.

Postdoc Scholar Award

Panos Zanos, PhD, *Psychiatry*

Having been published in high-profile journals during his postdoctoral fellowship, Dr. Zanos' research on fast-acting antidepressants could open new doors to treatments for major mood disorders and has led to a phase II clinical trial. Additionally, he has enthusiastically mentored several students and other postdocs during his time at the School of Medicine.

Postdoc Service Award

Katie Leonard, PhD, *Biochemistry*

Dr. Leonard's commitment to hard work and service shows itself both in her research on melanoma and in her continued service to her fellow postdoctoral fellows on campus. She has been integral in forming and helping to run the Postdoc Advisory Committee, which organizes career development and social events for the postdoc community. She has served as President and Treasurer of this organization and has volunteered in a number of other ways to serve both the students and postdocs.

PhD Thesis AwardEugene Gardner, PhD, *Molecular Medicine*

Dr. Garner's research in DNA sequence variations led to his development of a new bioinformatics tool. This research led to five publications, including two in *Nature*. The bioinformatics tool that he developed has already led to new scientific advancements, ranging from evolutionary questions to personalized medicine.

Teacher of the Year

Donald R. Matteson, PhD, *Associate Professor of Physiology*
Every graduate student across GPILS programs benefit from Dr. Donald Matteson's dedication to our University's teaching mission. As the director of GPLS 601 (also known as the Core Course), Dr. Matteson coordinates the teaching efforts of over 60 faculty members from virtually all Departments within the School of Medicine.

A FOCUS ON CAREER AND PROFESSIONAL DEVELOPMENT

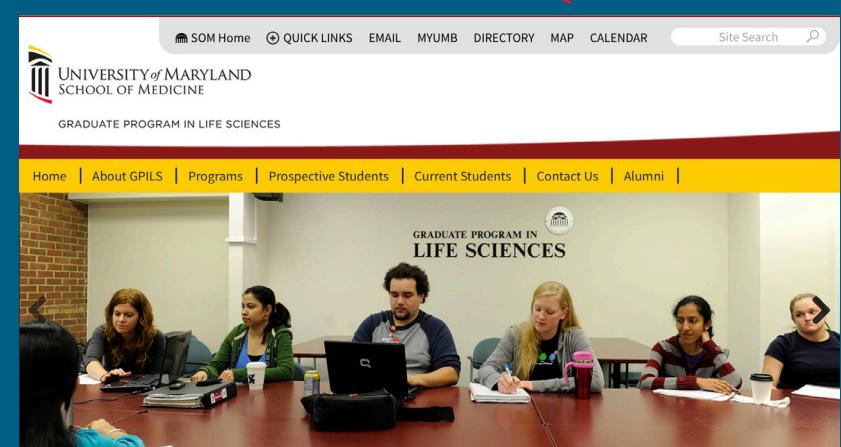
The GPILS Office of Career and Professional Development is committed to providing student researchers and postdoctoral fellows with the training and support needed to excel in their careers. "In addition to receiving top-tier mentoring from world renowned researchers, our trainees are afforded a variety of career development training opportunities, workshops, and career advising," said **Jennifer Aumiller**, Director, Pre & Postdoctoral Career Development.

Intensive Grant Writing Course

For example, the program offers an intensive grant-writing course for graduate students and postdoctoral fellows led by **Peixin Yang, PhD**, Professor of Obstetrics, Gynecology and Reproductive Sciences and Deputy Director of Graduate and Postdoctoral Studies, and **Dudley Strickland PhD**, Associate Dean for Graduate & Postdoctoral Studies and Director of the Center for Vascular & Inflammatory Diseases. The grant-writing course combines helpful information about the fundamental sections of the National Research Service Award application process and other federal grants and concludes with a faculty review of the grants.

Science Communications Internship

In addition to these opportunities, the Office of Career and Professional Development has partnered with the University of Maryland School of Medicine's Office of Public Affairs to offer a Science Communications Internship, and with Johns Hopkins University to offer a Teaching Fellowship where students and postdoctoral fellows can have the opportunity to gain teaching experience through partnerships with various higher-education institutions throughout the Baltimore area.



To learn more, visit lifesciences.umaryland.edu

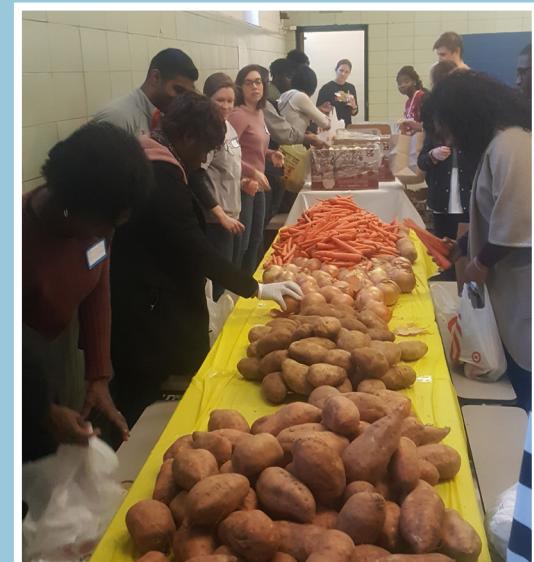
Students Helping Baltimore's Neediest

28TH PROJECT FEAST

For the 28th year in a row, on November 23, 2017, students from the University of Maryland School of Medicine (UMSOM) and other University of Maryland, Baltimore schools provided a Thanksgiving meal and more for some of Baltimore's neediest. Students, faculty, and staff gathered at Booker T. Washington Middle School on Thanksgiving to serve a meal and provide free clothing and food to those in need, including children. Medical students also took blood pressure readings. Over 400 meals were served, and 150 volunteers took part in this Baltimore tradition.

"We want to help Baltimoreans in need, with resources, donations, and food, more so than ever this year," said medical student **Lillian Assatourian**. She is one of five Project Feast co-coordinators who organized the event with the guidance of **Sheri Slezak, MD**, professor in UMSOM's Department of Surgery.

The event is just one of many community outreach efforts by UMSOM, including the Mini-Med School, as well as several student volunteer projects such as the CURE Scholars Program and CommUNITY Fest.

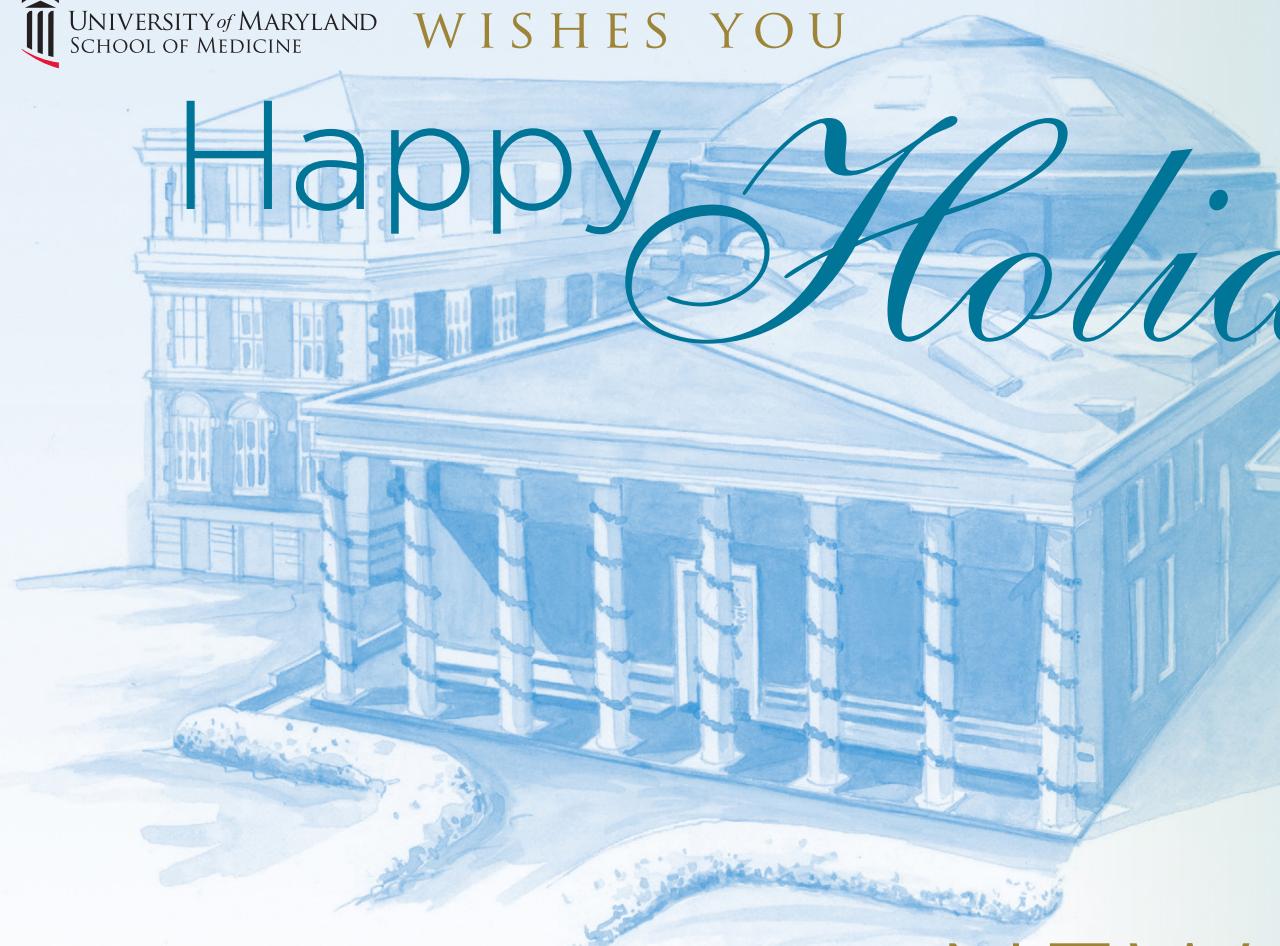


Celebrating a Third Century

UNIVERSITY OF MARYLAND
SCHOOL OF MEDICINE

WISHES YOU

Happy Holidays



AND a happy & healthy NEW YEAR

Holiday Spirit...



In the *Spirit of the Season*, we want to express our sincerest gratitude to everyone for a successful year. We wish you and your family a joyous holiday season, as well as health, happiness and a prosperous New Year.

- Dr. & Mrs. Reece

**"Practices"**

New UMSOM policy requires all patient care facilities to be called "practices."

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E. Albert Reece, MD, PhD, MBA
Vice President for Medical Affairs
University of Maryland
Dean, University of Maryland
School of Medicine
Chris Hardwick, Executive Editor
Tom Jemski & Mark Teske, Photos

Dave Beaudouin, David Kohn,
Joanne Morrison & Julie Rosen,
Contributing Writers
Kris Rifkin, Design



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