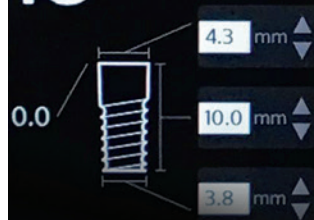


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**X-TREME
PRECISION**
NEW TECHNOLOGY
GUIDES IMPLANT
SURGERY

In early February, I attended the University of Maryland, Baltimore's Black History Month celebration, where Tiffany Otto, a fourth-year student at the University of Maryland School of Dentistry (UMSOD), received a Universitywide Diversity Recognition Award as Outstanding UMB Student.

Otto was honored for initiating and organizing opportunities for minority professionals and students to have meaningful discussions about the strain placed on individuals and communities by local and national civic unrest.

Her efforts, which she undertook while also successfully carrying a full academic load, are inspirational. It reminds me of how much we can accomplish when we are passionate about our work, our colleagues, and our goals. In an article in this issue of *Mdental*, Otto says her parents taught her to "be the change that I wish to see." By any measure, she is doing that.

I also have been inspired by the recent successes of other UMSOD community members, several of which are described in this issue. In a wide range of ways, they're identifying complex and pressing problems and discovering innovative methods of alleviating them.

In 2017, Mark Shirtliff, PhD, professor in the Department of Microbial Pathogenesis, and his collaborators formed two startup companies through which he is pursuing and commercializing preventive and diagnostic methods of stopping six of the most virulent bacterial strains.

Last fall, Gary Warburton, DDS, MD, FACS, associate professor in the Department of Oral and Maxillofacial Surgery, taught a course in India that focused on temporomandibular joint (TMJ) surgery—the first course of its kind in that country.

Warburton's course, detailed in this issue, already has changed one patient's life for the better and has the potential to improve the lives of many more.

This issue of *Mdental* also describes state-of-the-art technology called X-Guide being used by UMSOD surgeons and taught to our postdoctoral students. The technology, which was donated by Robert Emery, DDS '88, allows clinicians to use cone beam computed tomography to plan and place dental implants with great precision.



Emery's gift and those of alumni like him support the remarkable discoveries, innovations, and successes that occur at UMSOD every day. Their generosity, particularly during the Catalyst campaign, our Universitywide fundraising initiative, provides critical philanthropic support that ensures that we continue to fulfill our mission of education, innovation, research, public service, and patient care.

I hope you will enjoy reading this issue and, perhaps, find your own inspiration.

I look forward to seeing many of you—and hearing about your achievements—on June 8-9 at the All-Alumni Reunion.

A handwritten signature in black ink that reads "Mark Reynolds". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Mark A. Reynolds, DDS '86, PhD
Dean and Professor

UNIVERSITY OF MARYLAND SCHOOL OF DENTISTRY

ON THE COVER

- 10 *Using a new, innovative technology called X-Guide, UMSOD practitioners position and place implants with far greater accuracy.*

PHOTO BY HOLLY SELBY

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SCHOOL NEWS

UMSOD to Use New, Innovative Technology to Combat Opioid Epidemic

Armed with innovative technology created by DrFirst, a Maryland-based health care solutions company, University of Maryland School of Dentistry (UMSOD) practitioners soon will be helping to combat the national opioid epidemic.

The technology, donated to UMSOD by DrFirst, includes two programs: a web/phone application called iPrescribeSM and a communications system known as Backline.

“The School of Dentistry is the first dental college in the world,” said Mark A. Reynolds, DDS ’86, PhD, UMSOD dean and professor. “We would like to be first in leading the charge to help dentists learn more accountable pain management.”

Reynolds spoke at a March 16 news conference organized by DrFirst at its Rockville, Md., headquarters. Other speakers included Maryland Lt. Gov. Boyd Rutherford, chair of Maryland’s Heroin and Opioid Emergency Task Force; and officials from DrFirst; MedChi, the Maryland State Medical Society; and the Maryland Department of Health.

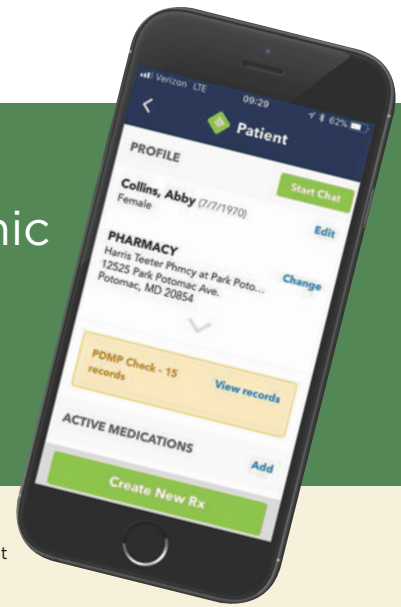
With iPrescribeSM, practitioners can prescribe medications with a few taps on a phone—without interrupting their workflow. They also are able to consult the Chesapeake Regional Information System for our Patients (CRISP)—Maryland’s Prescription Drug Monitoring Program (PDMP) database—to view patients’ complete medical histories.

Beginning July 1, Maryland will join 40 other states in requiring that all health care providers view medication history via an online PDMP registry before prescribing opioids.

“The CRISP system requires individuals to log into the web portal to check individual patients; it’s a manual, cumbersome process,” said James F. Chen, DrFirst’s chair, chief executive officer, and founder.

“Our system integrates the PDMP into the e-prescribing process within iPrescribe and allows practitioners to automatically check drug-to-drug and allergy interactions of more than 10,000 brands and types of drugs.”

Photo courtesy of DrFirst



A secure, legally compliant communications channel that allows patient care teams to communicate with each other is key to successful electronic prescribing and data sharing, Chen said in an interview. “The need for transparency is always there, particularly between the pharmacist and doctor regarding which prescriptions require prior authorization,” he said.

DrFirst’s Backline communications technology complements iPrescribeSM by providing clinicians with a secure messaging tool that facilitates instant patient data sharing. Backline’s messaging channels meet all Health Insurance Portability and Accountability Act, Health Information Technology for Economic and Clinical Health, and Joint Commission requirements, allowing clinicians to discuss care plans on their phones with no risk of liability.

A cohort of UMSOD dental and dental hygiene students will begin learning how to use the DrFirst apps in May; by July 1, all students and clinicians will be well versed in their use.

“We are preparing the next generation of oral health practitioners to integrate prescription drug monitoring into the clinical setting to better inform their prescribing practices,” Reynolds said. “As Maryland’s largest oral health care provider, we are transforming how we care for our patients by modeling best practices for large, multidisciplinary practices in dentistry.”

— SCOTT HESEL AND HOLLY SELBY

To view news stories about the UMSOD initiative, visit www.dental.umaryland.edu/drfirst.

UMSOD PROFESSOR ERNST NAMED UMB'S RESEARCHER OF THE YEAR



Robert K. "Bob" Ernst, PhD, professor and vice chair of the University of Maryland School of Dentistry's (UMSOD) Department of Microbial Pathogenesis, was named the 2017 University of Maryland, Baltimore (UMB) Researcher of the Year.

The honor, which recognizes a researcher whose work advances basic biomedical, public policy, or academic scholarship, has significant impact, and contributes to the strategic goals of the University, was presented last fall at the Founders Week Gala by UMB President Jay A. Perman, MD.

Ernst focuses on engineering rationally designed mimetics based on bacterial surface molecules that will inhibit the body's damaging immune response to sepsis, a condition that causes a death every two minutes in the United States.

In doing so, he conducts innovative research into the molecular basis by which bacteria modify the lipid component of their membrane, specifically lipopolysaccharide, and how these alterations affect normal innate immune system responses, potentially resulting in septic shock.

In 2016, Ernst and colleague David R. Goodlett, PhD, professor in the Department of Pharmaceutical Sciences at the University of Maryland School of Pharmacy, co-founded a startup diagnostic company called Pataigin. That fall, the company received a \$25,000 Maryland Department of Commerce Life Award for its patented test called "BACLIB," which inexpensively identifies bacteria- and fungi-causing infections in less than an hour, allowing clinicians to make decisions in the hospital at the "point of care."

Since coming to UMSOD in 2008, Ernst has attracted \$3 million in research funding.

To read a profile of Ernst that was published in the Fall 2017 issue of *Mdental*, visit www.dental.umaryland.edu/mdental/.

— HOLLY SELBY

ORAL SURGEON ORD HONORED WITH LIFETIME ACHIEVEMENT AWARD



Robert A. Ord, DDS, MD, FRCS, FACS, MS, professor and chair, Department of Oral and Maxillofacial Surgery at the University of Maryland School of Dentistry (UMSOD), received the William F. Harrigan Society's lifetime achievement award, presented annually to an individual who has made outstanding contributions to the specialty.

As the 2017 honoree, Ord delivered the keynote presentation at the society's annual meeting in New York in November, focusing on the evolution of mandibular reconstruction during his career.

Ord, who specializes in surgical oncology of the head and neck, has more than three decades of dental experience and has been a UMSOD faculty member since 1991. He has been named a "Top Doctor" by *Baltimore* magazine consistently since 2008 and has been named by his peers to "Super Doctors," a directory that lists by state the top 5 percent of specialists. Most of his surgeries relate to cancers of the oral cavity, jaw, sinuses, and salivary glands, and his research has led to chemoprevention trials for premalignant lesions.

Calling the Harrigan award an honor, Ord noted that remarkable developments have occurred in the field of oral and maxillofacial surgery. There have been changes in the types of diseases treated and the technology used to diagnose and treat patients, he said. Additionally, there have been "paradigm shifts in how we think about diseases. In terms of disease processes, HIV/AIDS, MRONJ, and HPV-related oropharyngeal cancer were all undiscovered entities when I qualified from dental and medical school!"

During his career, CT, MRI, and PET scanning have become available as well as 3-D computer planning for surgery and robotic surgery. "Less glamorous, but perhaps more applicable to dentistry as a whole, is the availability of reliable implant systems that has changed our ability to replace teeth in many patients," Ord said.

"In addition, paradigm shifts in the way we treat the neck in oral cancer and the recent use of immunotherapy have transformed oral cancer management. Disease now is being treated and researched at a molecular and gene level. The future of the specialty will continue to be dictated by advances in technology and basic/clinical research. The only constant is change."

Ord, who studied dentistry at King's College London and medicine at the Welsh National School of Medicine in Cardiff, Wales, teaches UMSOD graduate students at the residency and fellowship levels. He lectures internationally and has published three books and more than 100 scientific papers. He is a former examiner for the American Board of Oral and Maxillofacial Surgery, the Royal College of Surgeons of Edinburgh (Scotland), and the University of Singapore.

— GWEN NEWMAN

UMSOD WELCOMES CHINESE STUDENT VISITORS

A new exchange program developed by the University of Maryland School of Dentistry (UMSOD) offers its dental students and students from the Xi'an Jiaotong University College of Stomatology (XJTU COS) in China the chance to share knowledge, skills, and observations.

In February, seven second-, third-, and fourth-year students and a faculty member from XJTU COS spent a month at UMSOD. Plans are underway to extend to fourth-year UMSOD students the opportunity to participate next fall in a similar observation-based externship at XJTU COS.

The visiting Chinese students attended lectures; observed clinical, academic, and research operations; interacted with students, residents, and faculty; and participated in campus and area cultural activities, including touring Washington, D.C., and Annapolis, Md. The educational experience was tailored for each visitor depending upon academic level, interest in advanced dental education, and plans for research, says Kate Noonan, PhD, MEd, senior director, special projects for the dean, who oversees the program.

Additionally, UMSOD students had the chance to welcome, interact, and learn from the exchange students through programming, social events, and academic discussions.

Developed last fall when UMSOD Dean Mark A. Reynolds, DDS '86, PhD, traveled to China, the program allows students to strengthen relationships and share expertise.

Reynolds was accompanied in China by Robert A. Ord, DDS, MD, FRCS, FACS, MS, professor and chair, Department of Oral and Maxillofacial Surgery; Huakun Xu, PhD, MS, professor and director, Division of Biomaterials and Tissue Engineering; and Pei Feng, MD, PhD, professor, Department of Oncology and Diagnostic Sciences, and director, Office of Research.

— GWEN NEWMAN

Dean Mark A. Reynolds (center) and UMSOD faculty and staff meet with students visiting from Xi'an Jiaotong University.



▲ Fellows at the Amrita Institute of Medical Sciences in Kochi, India, observe TMJ surgery led by Gary Warburton (second from right).

ORAL AND MAXILLOFACIAL SURGEON FROM UMSOD OFFERS FIRST TMJ SURGICAL COURSE IN INDIA

Leading oral maxillofacial surgeons from throughout India attended a three-day course held at the Amrita Institute of Medical Sciences in Kochi, India. The course focused on temporomandibular joint (TMJ) surgery, including arthroscopic surgery and alloplastic (prosthetic joint) reconstruction for the TMJ. The first of its kind offered in India, the course was taught by Gary Warburton, DDS, MD, FACS, associate professor in the Department of Oral and Maxillofacial Surgery at the University of Maryland School of Dentistry.

“With fewer than five surgeons in India offering what we in the U.S. consider full-scope arthroscopic and advanced surgery for the TMJ, there’s a tremendous shortage of TMJ surgeons and a huge need that this course intends to address,” Warburton says. Held Oct. 31 to Nov. 3, the course is designed to enhance the professional development of surgeons in India and provide training in state-of-the-art TMJ surgical techniques.

Studies began with two days of class and cadaveric instruction on topics including patient evaluation, diagnosis, arthroscopic surgery, and alloplastic joint reconstruction. On the third day, participants were able to observe a complex, nine-hour TMJ surgery on a patient who needed joint replacements and facial reconstruction, performed by Warburton and his Indian colleague, Pramod Subash, MDS, DNB, MOMS, who spent a year training at the University of Maryland in 2008.

“Our patient was a 19-year-old girl with Treacher Collins syndrome who had not been able to open her mouth at all for more than 10 years due to a bony fusion [ankylosis] of her jaw joints. She had undergone four previous surgeries that had failed to correct this and, as a result, was not able to eat anything other than liquids or obtain the dental care that she needed,” Warburton says.

The patient is now able to open her mouth to 30 millimeters, which will improve further with physical therapy, eat a regular diet, and receive dental treatment, says Warburton. The surgery also significantly enhanced her facial appearance.

“To have successfully coordinated and performed this surgery was extremely rewarding,” Warburton says, adding that he plans to offer the course again in 2018 and may expand it to twice a year. “The enthusiasm of the surgeons who participated in the course gives us optimism for the future of this course and TMJ surgery in India.”

— SCOTT HESEL

INNOVATIVE CLINIC MODEL BROADENS ACCESS TO ORAL HEALTH CARE

A festive ribbon-cutting ceremony celebrated a new owner of a dental clinic that the University of Maryland School of Dentistry (UMSOD) had established in Perryville, Md., as well as a thriving partnership that is helping broaden access to oral health care in rural Maryland.

Under the new agreement between West Cecil Health Center, Inc. (WCHC) and UMSOD, the center will operate the clinic while predoctoral dental and dental hygiene students from the school continue to provide treatment to patients. Students in the dental hygiene program also will continue to participate in community outreach events at elementary schools and subsidized housing communities.

The unique partnership illustrates how “we innovate health care practices to

serve the most people and to serve them with dignity regardless of their ability to pay,” said Jay A. Perman, MD, president of the University of Maryland, Baltimore (UMB), who spoke at the Sept. 26 event.

Since opening the clinic in 2007, UMSOD has provided care for more than 16,000 adults and children, but the initial model was not sustainable. Instead, WCHC, led by John Ness, MBA, president and chief executive officer, agreed to own and operate the clinic, accepting adults and children on a sliding scale. The shift in ownership was made possible in part through a \$325,000 grant to WCHC from the Maryland Community Health Resources Commission (MCHRC) to help maintain the Perryville location as a clinical teaching site.

Participating in the ceremony were state and local dignitaries including Jinlene Chan,

MD, acting deputy secretary for public health services, Maryland Department of Health; Mark Luckner, executive director, MCHRC; Cecil County Executive Alan McCarthy, DVM; Harford County Executive Barry Glassman; and Del. Kevin B. Hornberger of Cecil County.

After thanking those in attendance for their support, UMSOD Dean Mark A. Reynolds, DDS '86, PhD, noted that the “innovative, sustainable model for high-quality oral health care delivery” is believed to be the first of its kind nationally.

“We’re very proud to be part of this partnership, which provides an opportunity for us to reduce barriers to access to care and to provide care to the citizens of Maryland, including those who have been traditionally blocked from it,” Reynolds said. “This model also enriches the educational experience that we provide our students.”

— PATRICIA FANNING



▲ A ribbon-cutting ceremony on Sept. 26 marked a new collaboration between UMSOD and West Cecil Health Center.

INTERNATIONAL SYMPOSIUM AT UMB EXAMINES ROLE OF STRESS IN CHRONIC PAIN

Chronic pain conditions rarely occur in isolation. Major ailments such as fibromyalgia and irritable bowel syndrome frequently overlap—and stress plays an important role in driving these co-occurrences.

“How well one copes with stress is shown to be contributory to overlapping conditions,” says Joel Greenspan, PhD, professor and chair of the Department of Neural and Pain Sciences at the University of Maryland School of Dentistry (UMSOD).

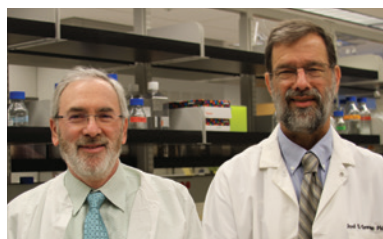
Evidence illuminating the role of stress in chronic pain was the focus of the third annual symposium at the University of Maryland Center to Advance Chronic Pain Research (CACPR). The event was held Nov. 17 on the University of Maryland, Baltimore campus.

Devised as a way to enhance cross-campus collaborative research, the CACPR is led by Greenspan and Susan G. Dorsey, PhD, RN, FAAN, professor at the University of Maryland School of Nursing.

The CACPR annual forum is an attempt to gather the foremost experts to discuss emerging issues in the pain field.

“The idea of examining multiple pain conditions and studying what drives them is an idea that gained traction two to three years ago,” Greenspan says. “Typically, people only look at one condition in isolation, like temporomandibular joint disorders or lower back pain.”

Richard Traub, PhD, professor and vice chair of the Department of Neural and Pain Sciences, presented evidence



▲ Richard Traub and Joel Greenspan, vice chair and chair, respectively, of the UMSOD Department of Neural and Pain Sciences

from animal studies showing that an experience of facial pain, combined with stress, leads to the development of persistent visceral pain in the body.

Another presenter, John F. Cryan, PhD, BSc, professor and chair of the Department of Anatomy and Neuroscience at University College Cork in Ireland, described how the microbiome, an internal ecosystem of bacteria in the gut, plays an essential role in regulating visceral pain sensitivity.

“The microbiome is involved with everything from diet to stress,” Greenspan says. “Recent research shows how the microbiome can modify neurons and specific brain regions responsible for our perception of pain.”

Ultimately, Greenspan hopes that the forum will spark new ideas and new collaborative research into the subject matter.

— SCOTT HESEL

WAR ON INFECTION

New, fast-track pathogen identification device is a key weapon

BY RANDOLPH FILLMORE

In shifting battlefields throughout the Middle East and in clashes with foes around the world, military personnel can fall prey to another elusive and hidden enemy—infection. Battlefield wounds, particularly those caused by improvised explosive devices (IEDs), are complex, quickly contaminated, and prone to invasion by microbial enemies. A rugged, easily deployed, accurate technology for identifying bacteria could prevent dangerous infections.

In the University of Maryland School of Dentistry's (UMSOD) Department of Microbial Pathogenesis, professor Mark Shirliff, PhD, has developed just that: a hand-held technology that can quickly identify six of the most virulent kinds of bacteria. Called *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter species*, they are known as the “ESKAPE” pathogens.

In early 2017, the University of Maryland, Baltimore (UMB) granted a startup company called Serenta Biotechnology, LLC, worldwide and exclusive rights to a new vaccine technology. Through Serenta, Shirliff—its co-founder and lead inventor—is working with major pharmaceutical companies and focusing on taking his multivalent vaccine against infections caused by *Staphylococcus aureus*—or *S. aureus*—into clinical trials.

Later in the same year, using many of the same antigen discovery technologies, Shirliff and his colleagues also moved into the diagnostic arena, chartering a second startup, CelerDX, to commercialize the potentially life-saving device.

This new diagnostic approach represents a new paradigm, switching from diagnosis after the emergence of symptoms to diagnosis and therapy before the symptoms of infection are manifest.

▲
Staphylococcus aureus biofilm

“For 150 years, we have been using the same culturing techniques to identify infection-causing pathogens,” Shirliff says. “This traditional method of bacterial culture may require seven to 14 days to find the ‘bugs’ responsible for multispecies infections. That’s way too long.”

WHY DOD WANTS TO FIGHT INFECTIONS

Funding for Shirliff’s research includes contracts with Advaxis, a biotechnology company, to develop animal models of chronic, prosthetic implant infection to test delivery strategies for cancer immunotherapeutics, and MedImmune, a biologics research and development company, to develop an animal model and a passive immunization strategy to prevent prosthetic implant biofilm infections caused by *Pseudomonas aeruginosa*.

Shirliff and his colleagues also received grants from the Maryland Technology Development Corp.’s (TEDCO) Maryland Innovation Initiative for \$125,000 to develop antigens for clinical trials against *S. aureus*. In addition, they have a \$750,000 grant from the U.S. Department of Defense (DOD) to develop a vaccine that will help prevent chronic infections in prosthetic implants. This grant is an extension of Shirliff’s original National Institutes of Health (NIH) funding. The DOD is particularly interested in the vaccine because the number of troops surviving IEDs and returning home to be fitted with prosthetic joints or limbs has risen.

“There has been a fivefold increase in troop survival rates over those seen since World War II,” Shirliff says. “That means that U.S. military personnel are returning with multiple, post-traumatic musculoskeletal injuries and implanted orthopaedic devices. Infections in these devices are relatively common.”

Wounded warriors aren’t the only ones to have prosthetic devices that may become infected. Having a vaccine that will help fight off the most common bacteria-caused infections will benefit millions of people by preventing infections and the need to have prosthetics surgically removed and replaced.

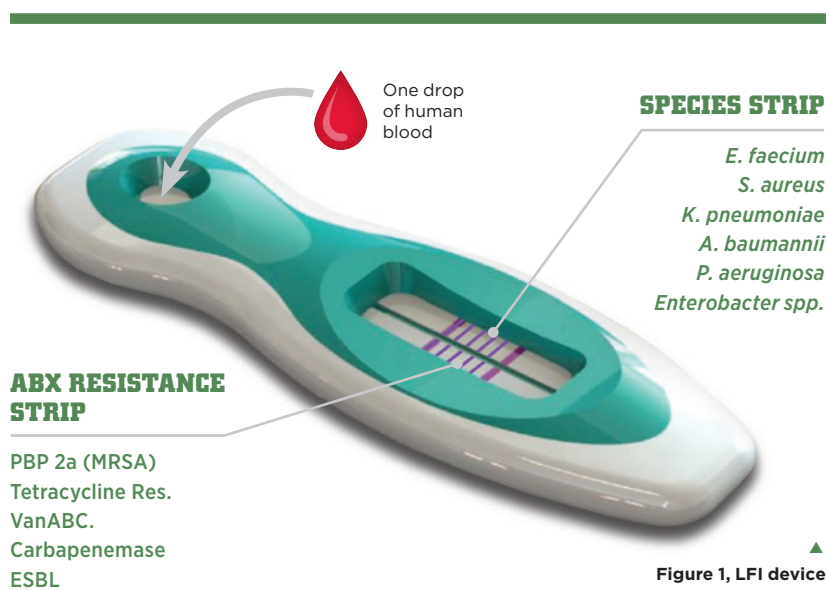
Additionally, “early and non-directed antibiotic use adds to the problem of antibiotic resistance development,” says Shirliff, who has a secondary appointment as a professor in the Department of Microbiology and Immunology at the University of Maryland School of Medicine. “One of our goals has been to develop a product capable of early, ultrasensitive, and culture-independent detection of some dangerous pathogens and their antibiotic sensitivities.”

Enter the lateral flow immunoassay (LFI), the device designed by Shirliff and his team to quickly identify the ESKAPE pathogens. Instead of detecting the pathogen, the LFI detects the elevated antibody levels in human blood to specific bacterial antigens that are expressed only during an active infection. (See Figure 1, LFI device)

“It takes about five minutes to identify one of the six pathogens,” Shirliff says. “The secret to its speed lies in choosing the right antigens to which we are detecting an antibody response.”

“Mark and his colleagues have developed a unique platform for relevant biomarker discovery that takes the biofilm mode of growth into consideration,” says James Kaper, PhD, senior associate dean for academic affairs, professor, and chair, Department of Microbiology and Immunology at the School of Medicine, who served on the UMSOD search committee that recruited Shirliff. “This technology will speed the diagnosis of the ESKAPE bacteria, which cause the majority of hospital-acquired infections in the United States.”

The LFI requires a small amount of sample blood—no more than drawn by a finger prick. “The LFI does not detect the pathogens themselves but detects and amplifies the patient’s immune response to the ESKAPE pathogens,” Shirliff says. “When a small blood sample is introduced to the LFI, the antibodies are labeled and laterally flow across



▲ Figure 1, LFI device

Designed by Mark Shirliff and his colleagues, the lateral flow immunoassay (LFI) can identify ESKAPE pathogens by detecting elevated levels of antibodies to these dangerous bacteria and potentially save thousands of lives annually.

Examples of biofilm-related infections

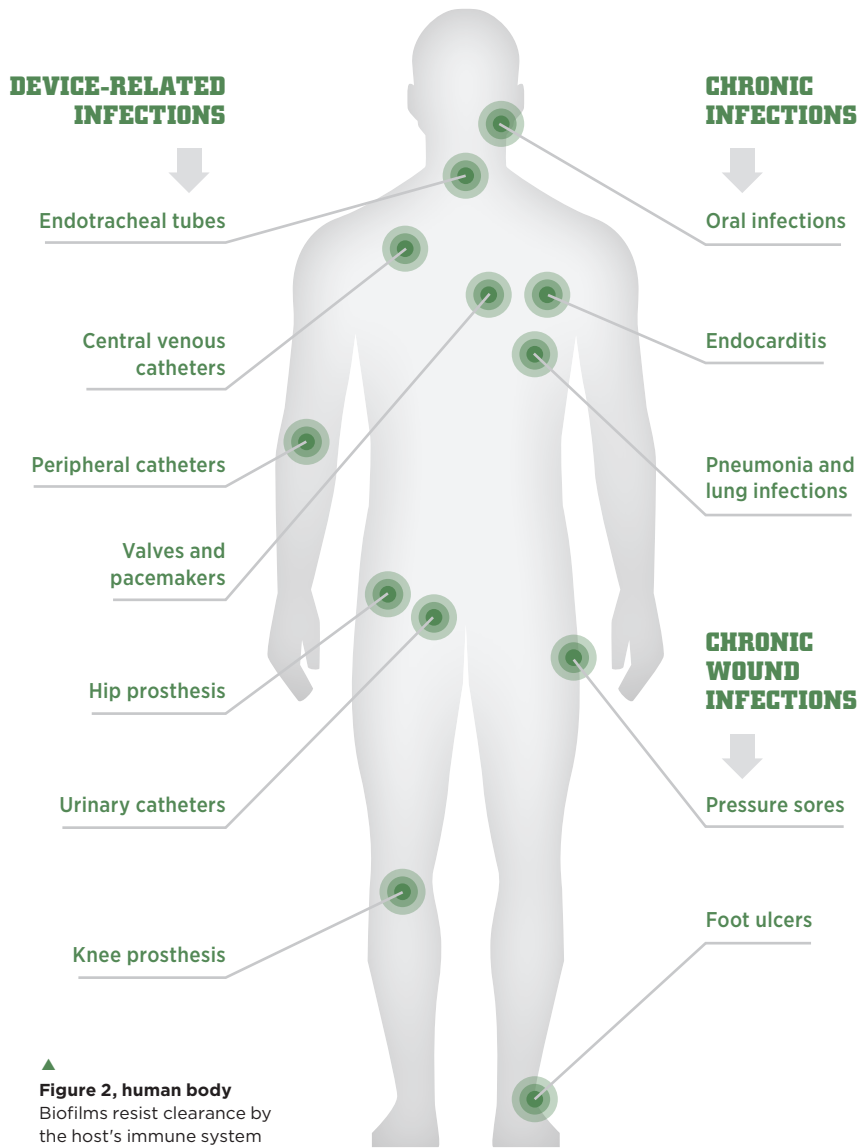


Figure 2, human body
Biofilms resist clearance by the host's immune system and are tolerant of antibiotics.

bacterial proteins on a paper strip. If the patient has an infection, the labeled antibodies will recognize the infection-specific bacterial proteins and stick to the strip, producing a red stripe and identifying the species causing the infection. It also identifies antibiotic resistance.”

Shirtliff says the LFI will be useful at several “point-of-care” sites, including hospital emergency rooms, surgical suites, and even in homes.

“Portable platforms for the rapid identification of pathogens, including the ESKAPE organisms, are vitally needed both in the field and clinical settings, allowing physicians to more appropriately treat these infections with the correct antibiotic and, thereby, improve antibiotic stewardship,” says Robert K. Ernst, PhD, professor and vice chair in the UMSOD Department of Microbial Pathogenesis.

Among Shirtliff’s UMB colleagues in this work are David R. Goodlett, PhD, professor of pharmaceutical sciences at the University of Maryland School of Pharmacy, and School of Medicine colleagues Robert O’Toole, MD, professor, and Theodore Manson, MD, associate professor. Shirtliff has several other colleagues, including Garth Ehrlich, PhD, of Drexel University; Javad Parvizi, MD, of the Rothman Institute; Randall Wolcott, MD, of Texas Tech University; Daniel Zurawski, PhD, of the Walter Reed Army Institute of Research; and Josh Wenke, PhD, of the U.S. Army Institute of Surgical Research.

Through CelerDX—the name comes from the Latin *celeritās* (rapid) and “Dx” (diagnosis)—Shirtliff and his collaborators aim to commercialize the LFI device, which also can be useful in diagnosing dangerous biofilms that are difficult to identify and even more difficult to eliminate.

BIOFILMS PLAGUE IMPLANTABLE DEVICES

Biofilms are groups of bacteria that can form on many surfaces, including implants—from artificial knees to pacemaker wires. They also can form along the gumline as a sticky plaque that exacerbates tooth decay.

“Biofilms are bacteria attached to an accommodating, hydrated surface and embedded in a polysaccharide-type of slime where the bacteria behave as a community,” Shirtliff says. “The bacteria begin reproducing, adding additional layers of what is called extracellular polymeric substance, or EPS. Those layers eventually become an enclosed, antibiotic-tolerant film.” (See Figure 2, human body)

According to the NIH, 80 percent of all infections are biofilm-related. In any one year, there are more than 17 million biofilm infections in the United States, with 550,000 cases resulting in death.

Biofilms are especially problematic because they resist clearance by the host's immune system and are tolerant to antibiotics, up to 1,000 times more tolerant than their free-floating counterparts.

In 2010, more than 1 million people who had prosthetic devices contracted biofilm infections, according to the Centers for Disease Control and Prevention. If the infection resists treatment, the prosthesis often has to be surgically removed.

“Not only are these infections difficult to diagnose, there is no single antibiotic effective against all strains of *S. aureus*, the most common cause of biofilm-associated infections of indwelling medical devices,” Shirliff says.

VACCINE DREAMS

Shirliff has been chasing *S. aureus* since graduate school, when he wrote his dissertation about the bacteria. Even as a doctoral student at the University of Texas Medical Branch in Galveston, he envisioned creating a vaccine against methicillin-resistant *S. aureus*, commonly known as MRSA.

“During the development and antigen discovery of our MRSA candidate vaccine, we figured out that developing a spinoff diagnostic system would simply be using two sides of the same antigen coin,” Shirliff says.

Calling Shirliff a leading expert in the field of biofilm infections in indwelling devices, Ernst says his work



PHOTO BY SCOTT HESEL

▲ Mark Shirliff, professor in UMSOD's Department of Microbial Pathogenesis, has developed the lateral flow immunoassay (LFI), a hand-held device that can quickly identify six of the most virulent kinds of bacteria.

“in pioneering the identification of the correct protein targets to include in his novel vaccine formulation should lead to an overall decrease in the number of failures on implanted devices, such as joint replacement, breast implants, or spinal screws and rods. The fact that his work has garnered the attention of many ‘Big Pharma’ groups speaks to the high probability for the success of his technology.”

The five different antigens in the MRSA vaccine can be used to capture and measure the host's antibody response using the LFI. In addition, the same platform for antigen discovery can be “turned over” and used to create vaccines and diagnostics against the pathogens.

“Serenta's collaboration with the University of Maryland has been instrumental in advancing our vision

of commercializing a methicillin-sensitive and methicillin-resistant *S. aureus* vaccine,” says Shirliff, explaining that the vaccine is a multivalent vaccine composed of four antigens that are expressed when *S. aureus* exists in a biofilm and a single antigen that is expressed when *S. aureus* is floating freely.

The goal is to treat MRSA infections and, even better, prevent them from occurring. This, of course, has not been a one-person job, and Shirliff is quick to point to the expertise and dedication of his colleagues, students, and postdocs, particularly Jan Harro, PhD, research associate, who has worked with him through the years.

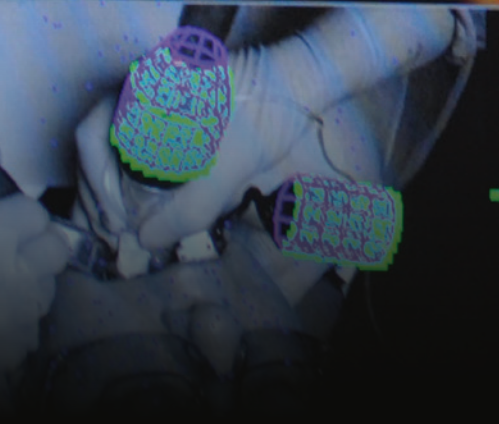
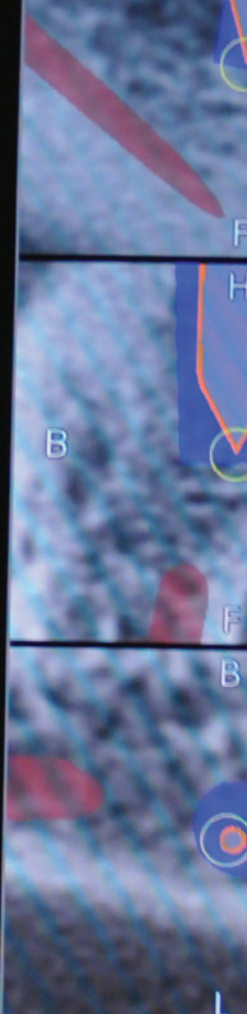
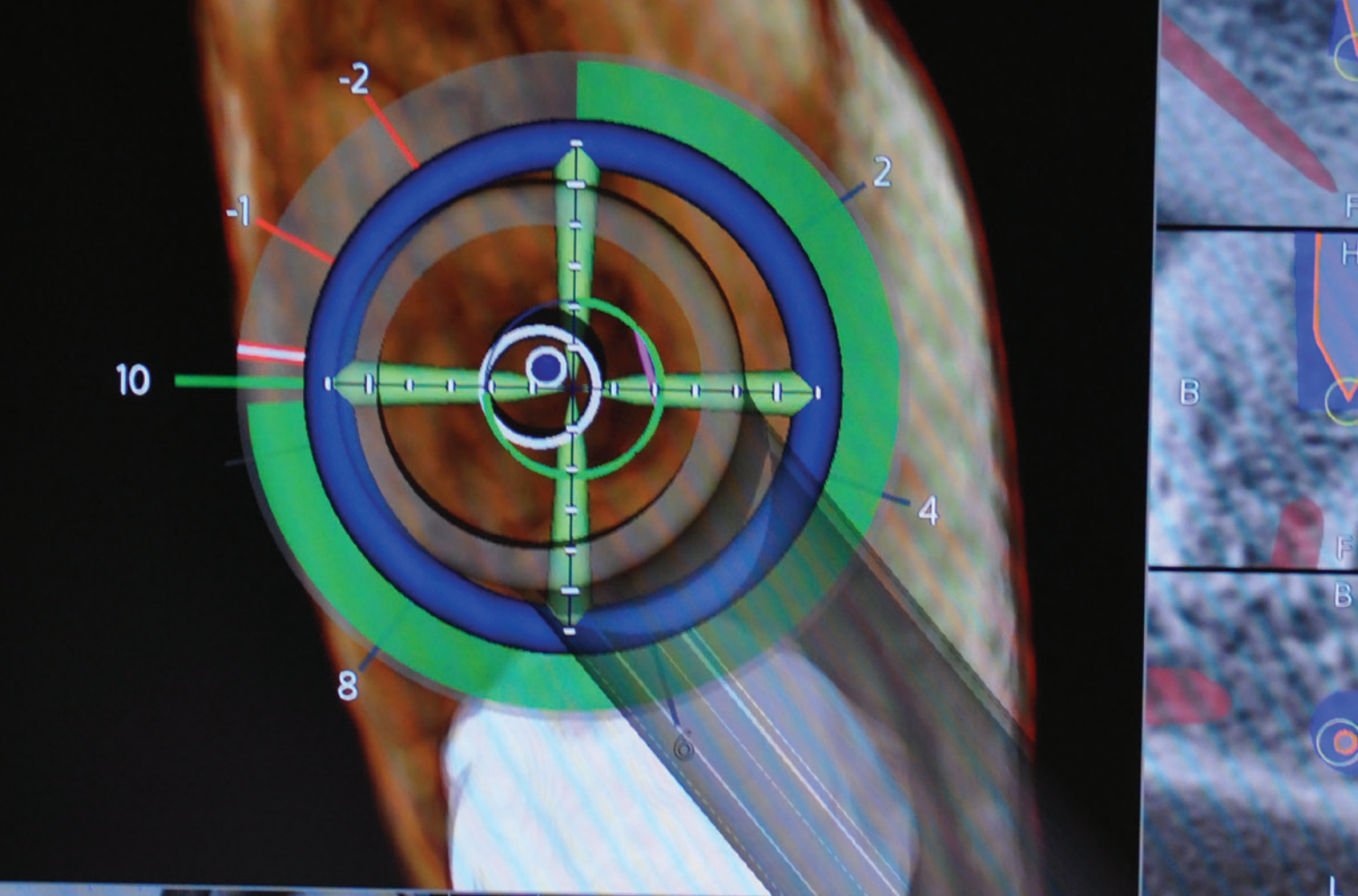
“Biofilm formation is a common virulence strategy for nearly all pathogenic bacteria and fungi,” Shirliff says. “Therefore, something so important to microbial disease also represents its Achilles' heel.”

He adds that his laboratory will continue to exploit the dependence of microbes on biofilms to wipe out chronic infections that kill more than 500,000 people in the United States every year. It's a trend he hopes to change. •

“This technology will speed the diagnosis of the ESKAPE bacteria, which cause the majority of hospital-acquired infections in the United States.”

—
JAMES KAPER, PhD

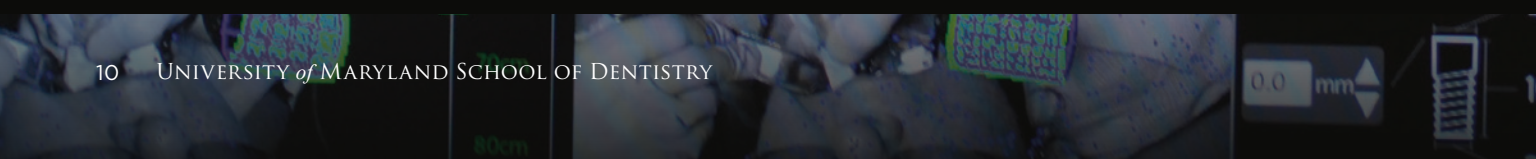
senior associate dean for academic affairs, professor,
and chair, Department of Microbiology and Immunology,
University of Maryland School of Medicine



▲ Images displayed on the screen enable the surgeon to see continuously updated information about the precise location, angle, and depth of the implant.

PHOTOS BY SCOTT HESEL AND HOLLY SELBY

ON TARGET



STORY BY SCOTT HESEL

Innovative Technology Guides Precision Implants

A new computer-based technology system being used at the University of Maryland School of Dentistry (UMSOD) could transform the way clinicians plan and place dental implants.

Called X-Guide, a dynamic, 3-D navigation system developed by X-Nav Technologies, LLC, the state-of-the-art technology allows clinicians to use cone beam computed tomography (CBCT) to plan and place dental implants with great precision. Donated to UMSOD by Robert Emery, DDS '88, founder of X-Nav Technologies, the system is being used in the school's Department of Oral and Maxillofacial Surgery.

Emery helped develop the X-Guide with the goal of improving outcomes of dental surgical procedures. "The X-Guide allows the dentist to see the tip of the drill in real time without radiation. They have X-ray vision using only light," he says. "I wanted to share this cutting-edge technology with the University so it could push the technology forward to improve the health of patients."

Describing the X-Guide as being "like a GPS," Behzad Mostoufi, DDS, MDS, director of dental implants in the Department of Oral and Maxillofacial Surgery, says, "The most important surgical aspects of restorative-driven implant placement are position, angulation, and depth."

At times, using the technology reminds Mostoufi of manipulating another piece of popular hardware. "The user-friendliness of the X-Guide feels like playing an Xbox," he says.

The new technology has broad implications for the field of implant dentistry, Mostoufi adds. "Based on current research, the X-Guide is far more accurate than freehand and static-guide, and it reduces the cost of making a surgical stent through a laboratory."

The annual dental implant market is expected to exceed \$4.4 billion by 2020, according to a July 2016 article in *Dentistry Today*. Advances in computer-aided design/computer-aided manufacturing (CAD/CAM) and cone beam technologies have enabled an increasing number of clinicians to expand the scope of their practices to include implants, and the X-Guide potentially could boost this growth.

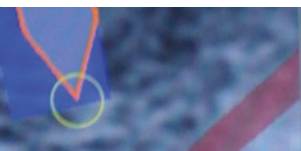
Use of the X-Guide involves a step-by-step process. First, clinicians place an X-Clip, which contains fiducial markers, or sensors, on the patient's teeth. "It's a simple procedure that takes fewer than 10 minutes," Mostoufi says.

CBCT imaging of the patient's full arches is processed, and the file is transferred onto the X-Nav software. This allows clinicians to plan a desired implant position, instead of fabricating a surgical guide.

They also can mark important landmarks and vital structures in panoramic and cross-sectional views. Additionally, with a few clicks, by drawing upon a virtual library, the X-Guide can plan crowns of optimal size and occlusion for implants. Most important, the system facilitates restoratively driven implant placement in real time.

During surgery, two cameras detect data from sensors that are attached to the X-Clip and a hand piece. The cameras then transfer 3-D information based on the CBCT to the system, which calculates and displays the virtual position of drills and implants in real time on a large screen.

"X-Guide is a highly effective technology," Mostoufi says. "Without a doubt, more applications of this system for zygomatic implants, endodontics, and other areas will emerge soon." •





▲ Two cameras detect sensors attached to the X-Clip (in the patient's mouth) and the surgeon's hand piece, enabling real-time transfer of 3-D information to the system. A large screen displays the virtual position of drills and implants.



▲ The X-Clip, molded to fit the patient's mouth, has three fiducial markers, or sensors, that track the position of the hand-held instruments relative to the patient's jaw and show it on a computer screen.



▲ Tools of the trade

ONE PATIENT'S STORY

STORY BY PATRICIA FANNING

The thought of using new technology intrigues me. But this time, I was not a consumer downloading an app—I was a dental patient considering implant surgery at the University of Maryland School of Dentistry (UMSOD), which has begun using the X-Guide 3-D navigation system.

I have had implants before (teeth 2 and 3), and these were successfully performed freehand. Now I needed a new tooth 18. During a consultation in which my surgeon, Behzad Mostoufi, DDS, MDS, explained the procedure, I opted for surgery utilizing X-Guide.

Mostoufi, director of dental implants in the Department of Oral and Maxillofacial Surgery, who already had extracted my molar, treated my abscess, and prepared the socket with a bone graft, would perform the surgery.

Several weeks before the procedure, I met with dental assistant Debrah Marshall to be fitted with an X-Clip. The device (about an inch wide and half as thick) bears three fiducial markers that during surgery would enable tracking of instruments relative to my jaw.

When Marshall immersed the clip in 160-degree water, it became as pliable as gummy bear candy. She fitted it to my lower teeth—opposite the implant site.

Next, she utilized cone beam computed tomography (CBCT) and loaded the images into my computerized file. The glimpse of 3-D images of my jaw, viewable in 284 slices and from multiple vantage points, was a bonus for the curiosity-seeker in me!

When Marshall finished, the hardened clip snapped out easily. Still, acquiring and adapting to the presence of the X-Clip is one difference between my experience with X-Guide and my past implants. (During much of the surgery, I was not able to use a bite block, which helps relieve jaw fatigue.)

On the day of my surgery, Marshall assisted Mostoufi. She applied firm pressure to snap on the X-Clip and warned against biting down. It felt bulky and was attached to a cylinder that I could sense hovering above my cheek. But I quickly grew accustomed to it. Given my small face and limited access to the back of my mouth, I was stretching wide anyway.



▲ From left, Dr. Behzad Mostoufi, director of dental implants in the Department of Oral and Maxillofacial Surgery; Debrah Marshall, dental assistant; and Patricia Fanning, patient, are all smiles after the surgery.

Beforehand, Mostoufi had consulted with Penwadee Limkangwalmongkol, DDS, MS, assistant program director of Prosthodontic Residency, who will fit my crown in about three months.

Using the X-Guide software and the CBCT images, she and Mostoufi planned the exact positioning of the post that will anchor my replacement molar.

During the procedure, Mostoufi's hand piece and associated X-Guide instruments were being tracked for display on a screen located out of my line of sight. But I knew that Mostoufi could see a 3-D image of my jaw—with a bull's-eye indicating where the post should go.

During insertion, GPS-like technology guided him so that the depth and angle of the implant were exactly as he and Limkangwalmongkol intended. "I didn't go left, I didn't go right," Mostoufi told me. Hearing about such precision, I began anticipating yet another benefit: excellent occlusion.

As he worked, I listened—trying to differentiate this implant surgery from past procedures. An addition to the lingo I usually hear: "calibrating."

One effect was visible, not audible, as lighting intended to enhance camera performance cast a sci-fi purple glow.

But much of the procedure felt and sounded similar to the others: "Irrigation, please. Suction, please." The numbing at the outset, a few stitches at the end were familiar, too.

Tucked under a lead apron, I received a bitewing X-ray. While admiring Mostoufi's handiwork, I was in for a pleasant surprise: I saw an abutment atop the post implanted in my jaw. Things had gone so smoothly, Mostoufi told me that he had completed the next step in the restoration, sparing a future appointment.

Yet another reason that this X-Guide patient finished with a thumbs-up.

Patricia Fanning is a senior media relations specialist in the Office of Communications and Public Affairs at the University of Maryland, Baltimore. To read her social media posts about the surgery, go to www.dental.umaryland.edu/#molarinthemaking.



REBUILDING *smiles.*
Restoring LIVES.

UMSOD clerkship helps domestic abuse survivors regain oral health and self-esteem

FORMER New York City NBC-TV *Live at Five* reporter Penny Nicholas first heard about the University of Maryland School of Dentistry (UMSOD) when she asked for assistance from the House of Ruth Maryland, a Baltimore shelter for victims of domestic abuse.

Diagnosed with breast cancer in 2000, the three-time Telly Award-winning executive producer and host of a cable TV show called *Images of Women* suddenly found herself a victim of domestic abuse. Her husband, she says, “never before raised his voice or lifted a hand.”

For the 5-foot-5 dynamo, it took just one encounter. But after divorcing her husband, the single mother of two daughters couldn’t afford routine dental care. Over time, the effects of chemotherapy coupled with a lack of oral health care took their toll.

“My teeth were literally falling out of my mouth,” she says.

Not long after contacting the House of Ruth Maryland, Nicholas, who changed her name after her divorce, was introduced to Shannon Vail, a fourth-year dental student and participant in UMSOD’s Domestic Violence Survivor Clerkship, an initiative that collaborates with the House of Ruth Maryland and another local shelter, Marian House, to offer free dental assistance to women in need.

Launched as a pilot program in 2011, the clerkship pairs patients with participating fourth-year dental students. Supervised by faculty, the students treat their patients and participate in weekly seminars focused on the specific oral health needs of this vulnerable population.

“One of the many challenges faced by victims of domestic violence is finding quality dental care by compassionate, nonjudgmental providers,” says Isabel Rambob, DDS, a clinical assistant professor in the Department of General Dentistry who oversees the UMSOD clerkship.

In its sixth official year, the clerkship has a budget of \$21,000, and participating students earn 10 credits through the experience.

“We’re rebuilding smiles, but more than that, we are providing these women with the confidence they need to get back onto their feet and out into the workforce,” says Mona Gorman, DDS, a clinical assistant professor who co-directs the program.

Proposed in 2010 by Dan Gibson, DDS ’11, the program has engaged 51 students who have provided treatment, including fillings, extractions, crowns, and dentures, to more than three dozen women.

Now a practicing dentist in La Jolla, Calif., and a clinical instructor with the University of California, San Diego’s pre-dental program, Gibson got the idea for the clerkship when he learned that many homeless women are victims of domestic violence and that 75 percent of their injuries are to the head, neck, and mouth region.

According to the *Journal of Dental Education*, he says, 90 percent of patients who visited dentists while exhibiting obvious signs of abuse reported when surveyed that they had not been questioned about their injuries; 70 percent indicated a desire for that interaction.

The clerkship seemed a “great way to teach dental practitioners how to potentially identify signs of domestic abuse,” Gibson says. “The stats were unbelievable. It’s not just physical abuse but control: preventing someone from seeing a dentist, for example.”

The effects of good dental care can be life changing, says Vonsetta Manns, LGSW, a licensed clinical social worker at Marian House. “We have many women with tooth abscesses. Many haven’t been to a dentist in years or go only when they’re in pain,” she says. “These women seem to be empowered immediately when they receive services.”

In particular, Manns recalls one patient who initially only spoke when covering her mouth.

◀
Fourth-year student Shannon Vail provided Penny Nicholas with abscess treatment, restorative work, and teeth whitening as part of a UMSOD clerkship aimed at aiding survivors of domestic abuse.

“That doesn’t work well in interviews. But this young lady excelled once she got her smile back. She started working full time and has her own place,” Manns says. “Transforming her smile was definitely a huge catalyst for her success.”

The opportunity to have an immediate impact was a draw for Brittany Bergeron, DDS ’13, who participated in the clerkship.

“Some of these women are anxious when they first come in and protective of their personal space,” says Bergeron, now practicing at Dr. Garcia and Associates in Baltimore. “But when they leave, you see them laughing more; they’re open to conversation and just feel better about themselves.”

Vail concurs. “To look at someone and know you’re helping her through one of the roughest times of her life is one of the best things you can find in any profession. It’s rewarding to see how dentists can really help increase someone’s self-confidence, self-esteem, and self-worth.”

As a former patient and now aspiring book author, Nicholas couldn’t agree more.

After the House of Ruth Maryland staff introduced her to the UMSOD program, “the students and the faculty showered me with care, empathy, and compassion that I hadn’t been shown for so, so long,” she says.

From left, Penny Nicholas, former TV reporter; Vonsetta Manns, clinical social worker/case manager at Marian House; Julia Caplan, program coordinator for the Intimate Partner Violence Assistance Program at the Veterans Affairs Maryland Health Care System; and Shannon Vail, dental student, participated last October in a panel discussion marking Domestic Violence Awareness Month.



▲ As part of a UMSOD clerkship, student Shannon Vail “helped restore not only my smile but my belief that there are good people,” says patient Penny Nicholas.

For Nicholas, who shared her story last October at a UMSOD panel discussion as part of Domestic Violence Awareness Month, regaining her smile meant receiving treatment for abscesses, having major restorative work, and getting her teeth whitened.

Now living in Bowie, Md., and serving as a speaker who advocates for domestic violence awareness, Nicholas says UMSOD “helped restore not only my smile but my belief that there are good people and good programs to help women in need. Their support helped me regain my life, and for that I am thankful.” •



PHOTO BY GWEN NEWMAN

UMSOD STUDENT RECOGNIZED BY UMB *for* DIVERSITY EFFORTS

BY CHRIS ZANG

Tiffany Otto, a fourth-year dental student, received a Universitywide diversity recognition award as Outstanding UMB Student at the University of Maryland, Baltimore's Black History Month celebration on Feb. 1.

During her time at the University of Maryland School of Dentistry (UMSOD), Otto has provided meaningful discussions for minority professionals after traumatic local and national incidents such as at an open forum with City Councilman Brandon Scott and a post-Freddie Gray meeting, which allowed her colleagues to speak freely and safely. She also helped coordinate an event supporting slain Muslim students at North Carolina colleges with other student groups on campus.

Otto is continuously thankful for support that extends to the top.

"After the Universitywide open forum event [on the shooting deaths of unarmed black men], I talked about the content and feedback received from minority and nonminority students with Dean [Mark A.] Reynolds," Otto said. "He expressed not only his support for minority professionals to obtain healing from traumatic events, but he was further interested in knowing how the school could help in the future."

Then there is Otto's work as president of the Student National Dental Association (SNDA).

UMSOD's SNDA won Chapter of the Year for the second consecutive year for notable activities such as the Generation NeXT mentorship program, which provides opportunities for UMSOD students to mentor high school students, monthly community service, and an oral cancer walk, which raised \$19,445.

Otto says the SNDA's dozens of events were possible because of the executive board and chapter members who share her vision. She also credits SNDA advisors Isabel Rambob, DDS, clinical assistant professor in the Department of General Dentistry, and Andrea Morgan, DDS, director of Student Advocacy and Cultural Affairs, for their ideas and unwavering support.

Teebok Choe, president of UMSOD's Class of 2018, described Otto as someone who "champions a universal inclusiveness and diversity for all." Choe went on to state, "I wholeheartedly believe that she has left a lasting impression on not only the School of Dentistry but the campus and all the students within, and among visitors who were lucky enough to come in contact with her."

Otto also has served as vice president of Healthy Smiles for Baltimore and vice chair of the Baltimore Minority Council of Professional and Graduate Students. "The dental school has a diverse student population and, in

turn, a number of cultural groups have formed," Otto said. "This allows us to be mutually supportive of each other while in the program."

"Incredibly grateful and honored" to receive a diversity recognition award, Otto credits her parents for putting her on the public service path.

"My parents taught me very early to treat others well, to do good, and to be the change that I wish to see—and it has truly gone a long way. It took a village to get me here, and I owe it to that village to enter spaces at UMB with the same love, energy, and tenacity that they taught me." •



▲ Tiffany Otto accepts her award with UMSOD Dean Mark A. Reynolds (left) and UMB President Jay A. Perman.

Shared Experiences

ADA News features UMSOD students and chronicles their days in dental school

BY HOLLY SELBY



▼ First-year students Benjamin Horn, LaShonda Shepherd, and Dan Yang

ONE student always knew she wanted to be a dentist. A second already has enjoyed a successful career as a Navy aviator. A third was drawn all along to the health care professions but until recent years wasn't sure which discipline to pursue.

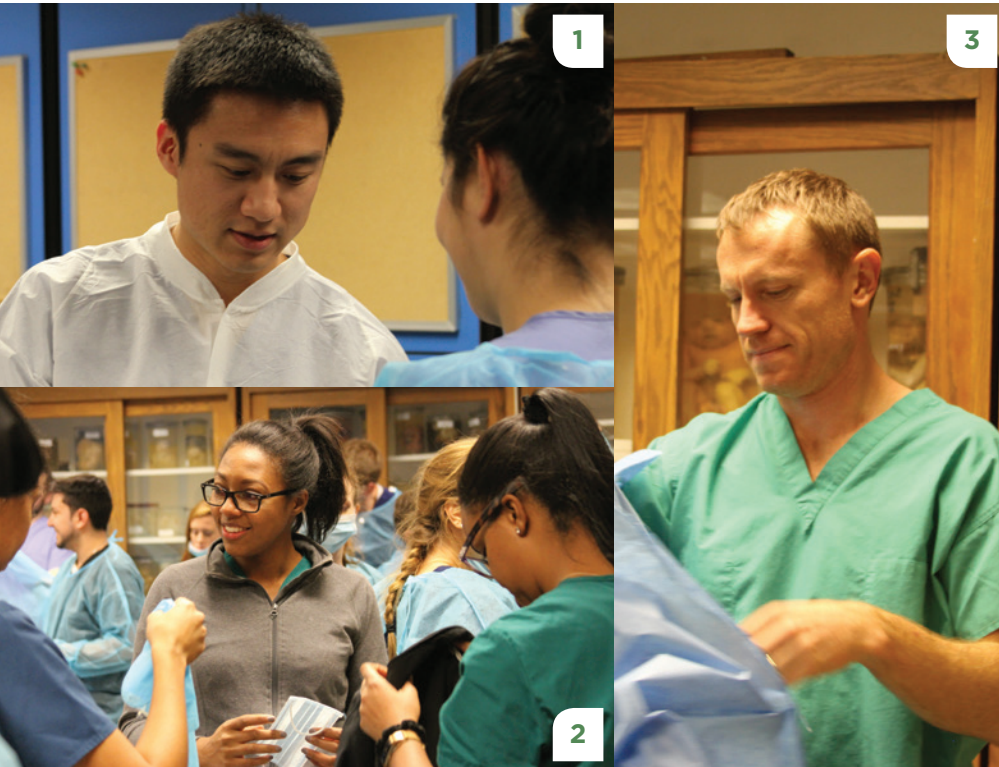
These are three of the 130 men and women who entered the University of Maryland School of Dentistry (UMSOD) in August 2017 as first-year students; they also are the subjects of a series of articles being published in *ADA News*, the American Dental Association's publication. The ADA is a Chicago-based dental professional association with more than 155,000 members.

The articles, written by Jennifer Garvin, Washington, D.C., editor for *ADA News*, are envisioned as a series that will follow UMSOD first-year students Benjamin Horn, LaShonda Shepherd, and Dan Yang through all four years of dental school and illuminate readers about the dental school experience.

"The ADA project is an unusual undertaking that promises to be interesting and informative," said UMSOD Dean Mark A. Reynolds, DDS '86, PhD. "I also hope that it will bring national recognition to and discussion about the education our students receive during their years here."

So far, readers of the series have learned about the students' career aspirations, methods of coping with their demanding workloads, and their experiences in gross anatomy lab as they worked, under the guidance of Guang Bai, PhD, MD, UMSOD research assistant professor in the Department of Neural and Pain Sciences, for the first time with human cadavers.

Shepherd, a Grady, Ala., native and graduate of the University of Maryland, College Park (UMCP), has always wanted to be a dentist. After college, she spent a few years working as a benefits specialist for a D.C.-based nonprofit called the Climate Reality Project. "My initial plan was to pay off



1

3

2

1
Yang, who volunteers to make bag lunches for the homeless once a week, aims to use his dental career to help others.

2
Shepherd, who hopes to expand access to oral health care in her Alabama hometown, gets ready for gross anatomy class.

3
A father of two, Horn approaches dental school like a job.

some undergrad debt and then return to school. But I met some really great people during my time at [Climate Reality] and felt like we were doing substantive work, and so I continued to work when I began taking evening courses to finish my prerequisites," she told Garvin.

A father of two, Horn rises daily at 4:30 a.m. and commutes to UMSOD from Annapolis. After graduating from the U.S. Naval Academy, he served as a naval aviator. In 2016, after taking the required prerequisites for dental school while still flying F/A-18s full time, he received a Navy Health Services Collegiate Program scholarship.

After dental school, he plans to resume his Navy service, this time as a dentist. "Some people don't get to follow any of their dreams in life. I consider myself immeasurably fortunate to have lived one of my dreams as a naval aviator, and now I get to pursue another to become a dentist," he told Garvin.

Yang, who majored in bioengineering at UMCP, initially planned to apply to medical school. He even worked at the University of Maryland Medical

Center conducting research before an opportunity to shadow a dentist convinced him that this was the career for him. "I always knew that I wanted to be in health care because I really enjoy that special patient-health care provider interaction/relationship," Yang said in an interview with *ADA News*. "Dental school made a lot of sense to me because I really enjoy working with my hands."

The experience of having their stories told has been interesting, the students say. "I would imagine seasoned dentists get a chuckle when they read the story and think back to their days as a D1. At the same time, prospective dental students might gain a little insight into what school would be like for them," Horn said. "I think the reaction has been positive. My peers like to see UMSOD written about by the ADA, and the stories give friends and family insight into what our days at school are really like." •



TO READ MORE

about first-year students Benjamin Horn, LaShonda Shepherd, and Dan Yang, visit www.dental.umaryland.edu/ADA.



STUDENTS RAVE ABOUT ELITE **NIH SUMMER PROGRAM**

Two second-year University of Maryland School of Dentistry students participated in a prestigious research program organized by the National Institutes of Health's (NIH) National Institute of Dental and Craniofacial Research. Called the Summer Dental Student Award program, the initiative provides opportunities for an elite group of dental students to spend the summer at NIH in Bethesda, Md., conducting research under the guidance of a mentor who holds expertise in their area of interest.

Jordan Jackson, a Waldorf, Md., native, investigated atopic dermatitis and chronic itch in mice. Niklas Malmstrom, who's from Rochester, N.Y., studied the etiological process of inflammatory diseases like Sjogren's syndrome.

"Often while studying, I took for granted the information that I was learning," Jackson says. "This experience helped put into perspective that it may have taken a research team 10 years to discover and understand one receptor, or one concept in a scientific mechanism. However, that discovery could be pivotal in identifying a cure to a disease."

Spending the summer immersed in the complexities of research strengthened his ability to interpret investigation results, Malmstrom says. "The atmosphere at NIH was incredibly stimulating. Perhaps what was most challenging was breaking down complicated aspects of experimental techniques," he says.

Working at NIH also heightened Malmstrom's appreciation of research. "I am definitely interested in continuing to be involved," he says, "and I think this program certainly inspired in me a more resolute understanding of the value of basic sciences research."

— GWEN NEWMAN

TAKING A MOMENT

ANNUAL SCHOLARSHIP LUNCHEON OFFERS A CHANCE TO PAUSE AND REFLECT

Expressions of gratitude come in many sizes and shapes, whether through complimenting a stranger or sponsoring a meritorious student, said Charles A. Doring, DDS '87. His remarks came at the Annual Scholarship Luncheon held April 16 at the Dr. Samuel D. Harris National Museum of Dentistry to toast University of Maryland School of Dentistry (UMSOD) students who receive scholarships—and to reflect upon the generosity of alumni donors. Other speakers included Richard A. Collins, assistant dean, Office of Development and Alumni Relations, and Linda Powers, a third-year dental student.

Looking around the room, Doring, who is the UMSOD chair of the University of Maryland, Baltimore's Catalyst fundraising campaign, urged the 51 scholarship recipients to "think about the many people who helped you get here today—your parents, your siblings, each other, your friends, and fellow classmates. Never miss an opportunity to thank those who helped you."

— HOLLY SELBY



Scholarship recipients took a break from classes and clinics to reflect on those who support them.



Saying she "could not imagine a more rewarding way to spend my life" than in dentistry, third-year student Linda Powers added that it was invaluable to know there are alumni who support her in her goals.



Charles A. Doring urged all in attendance to "never miss an opportunity to thank those who helped you."



Students were all smiles during the Annual Scholarship Luncheon.



Richard A. Collins (fourth from right), assistant dean in the Office of Development and Alumni Relations, poses with some of the scholarship recipients.

LAURELS

AWARDS AND SCHOLARSHIPS



Alenna Monet and Kathryn Pawlak

Alenna Monet and Kathryn Pawlak, third-year DDS students, won scholarships from the Maryland State Dental Association (MSDA) that were presented during the MSDA meeting at the Chesapeake Dental Conference in September in Ocean City, Md.



Isabel Rambob

Isabel Rambob, DDS, clinical assistant professor, Department of General Dentistry, and assistant director of Advanced

Education in Dentistry, received the CF Charities' "Champion for Kids Award" in June during the CF Charities Super Car Show in Philadelphia.

APPOINTMENTS AND ACCOLADES



Patrik Bavoil

Patrik Bavoil, PhD, professor and chair, Department of Microbial Pathogenesis, was elected in September to the board of directors of the Federation

of European Microbiological Societies. His new title, which became effective in January, is director, research and publications. Bavoil also is the lead author of "Does Active Oral Sex Contribute to Female Infertility?" published in October in the *Journal of Infectious Diseases*.

Joel D. Greenspan, PhD, professor and chair, Department of Neural and Pain Sciences, and co-director, University of Maryland Center to Advance Chronic Pain Research, was appointed to the Advisory Council for the National Center for Complementary and Integrative Health of the National Institutes of Health. Appointed by the secretary of the U.S. Department of Health and Human Services, council members advise, consult, and make recommendations about the future direction and activities of the center, including the research it sponsors.

GRANTS



Douglas Barnes

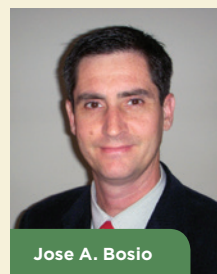
Douglas Barnes, DDS, MS, professor, Department of General Dentistry, was awarded a five-year, \$828,300 grant from the Maryland Department

of Health and Mental Hygiene to provide dental services for the Family Investment Program and the Health Care for the Homeless Program.

Robert Choe, DDS, third-year resident, Division of Prosthodontics, received a one-year, \$4,000 grant from the American Academy of Fixed Prosthodontics in June. Choe's grant will conclude with a research manuscript submission to the *Journal of Prosthetic Dentistry* in 2018.

Negar Homayounfar, DDS, MS, clinical assistant professor, **Andrey Doroshenko, DDS**, assistant professor, and **Radi Masri, DDS, PhD, MS**, associate professor, all in the Department of Advanced Oral Sciences and Therapeutics, received a one-year, \$3,000 grant in August from the American Academy of Esthetic Dentistry. Their proposal is titled "Evaluation of the Effect of Burnout Residues of 3D Printing Resins on Aesthetic Outcomes of Pressed All-Ceramic Restorations."

PUBLICATIONS AND PRESENTATIONS

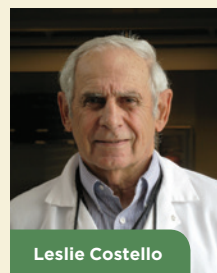


Jose A. Bosio

Jose A. Bosio, BDS, MS, program director, Department of Orthodontics, co-authored "Odontologia Digital Contemporanea—Scanners Intraoral

Digitais," published in October in *Ortho Science and Practice*.

Leslie Costello, PhD, professor, and **Renty Franklin, PhD**, professor, both in the Department of Oncology and Diagnostic Sciences, presented "The Role of Zinc in the Normal Prostate; and Decreased Zinc in the Development and Progression of ZIPI-Deficient Prostate Cancer. The Basis for a Zinc Ionophore Approach for the Prevention and Treatment of Prostate Cancer" during the "Tripping Over the Truth Retreat" in November in Baltimore.



Leslie Costello



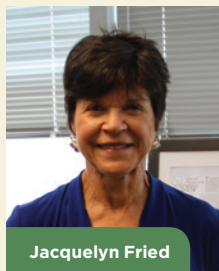
Renty Franklin



Vineet Dhar

Vineet Dhar, BDS, MDS, PhD, clinical associate professor and interim chair, Orthodontics and Pediatric Dentistry, was the lead author of “Use

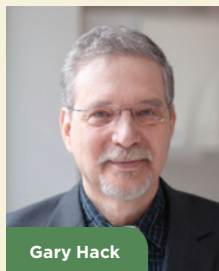
of Vital Pulp Therapies in Primary Teeth with Deep Caries Lesions,” published in October by *Pediatric Dentistry*.



Jacquelyn Fried

Jacquelyn Fried, RDH, MS, associate professor, Division of Dental Hygiene, and director of inter-professional initiatives, was

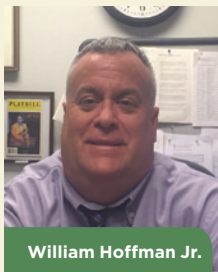
the author/lead author of two papers published in the September issue of the *Journal of Dental Education*: “The Allied Dental Professions: Executive Summary” and “Preparing the Future Dental Hygiene Workforce: Knowledge, Skills, and Reform.”



Gary Hack

Gary Hack, DDS '79, MS, clinical associate professor, Division of Prosthodontics, and director of the school’s simulation lab, gave

a presentation titled “Emerging Technologies in Dental Education: The University of Maryland Experience” during the Association for Dental Education in Europe’s annual conference in August in Vilnius, Lithuania.



William Hoffman Jr.

William Hoffman Jr., MAS, research administrator, Office of the Dean, was a co-presenter of two sessions, “Human Resources Management

and Best Practices for the Department Administrator” and “Strategies for Success: Managing Faculty Compensation and Funding Streams,” at the National Council of University Research Administrators Region II 2017 spring meeting in Saratoga Springs, N.Y.

Mary Anne Melo, DDS, MSc, PhD, associate professor, **Michael Weir, PhD**, research assistant professor, and **Huakun Xu, PhD, MS**, professor and director, Division of Biomaterials and Tissue Engineering, were among the co-authors of two papers published in May 2017. The first, “Developing a New Generation of Antimicrobial and Bioactive Dental Resins,” was published in the *Journal of Dental Research*, and the second, “Current Insights into the Modulation of Oral Bacterial Degradation of Dental Polymeric Restorative Materials,” appeared in *Materials*.

Additionally, Melo gave a presentation titled “Bioadhesive Behavior of Oral Biofilm on Dental Composite Surfaces Containing Protein-Repellent and Antibacterial Monomers” in June at the Stevens Institute of Technology in Hoboken, N.J.

Abraham Schneider, DDS, PhD, associate professor, Department of Oncology and Diagnostic Sciences, and **Huakun Xu, PhD, MS**, professor and director, Division of Biomaterials and Tissue Engineering, were among the co-authors of “Metformin Induces

Osteoblastic Differentiation of Human Induced Pluripotent Stem Cell-Derived Mesenchymal Stem Cells,” which was published in May in the *Journal of Tissue Engineering and Regenerative Medicine*.

David A. Seminowicz, PhD, associate professor, and **Andrew J. Furman**, graduate student, both in the Department of Neural and Pain Sciences, were among the co-authors of “Cerebral Peak Alpha Frequency Predicts Individual Differences in Pain Sensitivity,” which was published in *NeuroImage* in February 2018.



Sheryl Syme

Sheryl Syme, RDH '88, MS, associate professor and director, BS Degree Completion Program, and director, curriculum management,

Division of Dental Hygiene, was among the co-authors of two articles published in August: “Identifying Victims of Human Trafficking,” in *Dimensions of Dental Hygiene*, and “Human Trafficking: Red Flags for Dental Professionals,” in *Decisions in Dentistry*.

Vivek Thumbigere-Math, BDS, PhD, assistant professor, Department of Periodontics, was among the co-authors of “Hypercementosis Associated with ENPP1 Mutations and GACI,” published in October in the *Journal of Dental Research*.



MISSION *Accomplished*

At the Baltimore
Mission of Mercy,
UMSOD Volunteers
Offer Free Treatment
to Nearly 950 Patients

—
STORY AND PHOTOS
BY HOLLY SELBY

ONE 34-year-old janitorial worker and mother of two stepped into line at 3:30 a.m. Another woman, who said she was unemployed, joined the queue at 5 a.m. A 27-year-old man arrived at 7 a.m.

They were among hundreds of local residents who lined up outside the Baltimore Convention Center early on Wednesday, Oct. 11, hoping to participate in the Baltimore Mission of Mercy.

During the next two days, nearly 950 patients received free dental care provided by 275 University of Maryland School of Dentistry (UMSOD) volunteers—including dental and dental hygiene students and faculty members—who took X-rays and performed 2,000 extractions, 200 fillings, and 160 preventive treatments such as cleaning. In addition, staff members from UMSOD's Central Materials Management Systems department worked steadfastly to keep sterile instruments ready for use.

The annual event, which is part of the United Way of Central Maryland's Project Homeless Connect, is designed as a "one-stop" venue where the uninsured or underinsured can receive oral health and medical services as well as legal and other social services.

Although the event officially was held Oct. 12-13, UMSOD got a head start by offering free dental X-rays, wristbands, and guaranteed next-day treatment to the first 200 people who came one day early.

▲
Hundreds of local residents line up outside the Baltimore Convention Center early on Oct. 11 in hopes of securing free oral health treatments during the next two days.

The 34-year-old mother of two, who gave only her first name, Monica, got in line before sunrise because she was determined to receive treatment. "I really needed a tooth extracted, and I already paid \$350 to have a wisdom tooth out. I work at the casino, but I can't afford it," she said after her procedure. "My tooth hurt and was beginning to chip away. I am just glad to get it over with."

Baltimore resident Leslie Sidbury, who had four teeth extracted and was waiting for her husband to have teeth extracted as well, said she was relieved and grateful. "My husband has been really sick from his teeth. This helps a lot of people who can't afford dentists," she said.

Other patients also expressed their appreciation. "I did a lot of triage work, and the first thing most patients said was, 'Thank you,' or 'God bless you,'" said Ramsay Koury, DMD, a UMSOD clinical assistant professor who oversaw the dental clinic along with Louis G. DePaola, DDS, MS, associate dean of Clinical Affairs. "Many of these patients have no resources, and the overall aim was to provide quality care. It became a great opportunity for us all to work together."



1



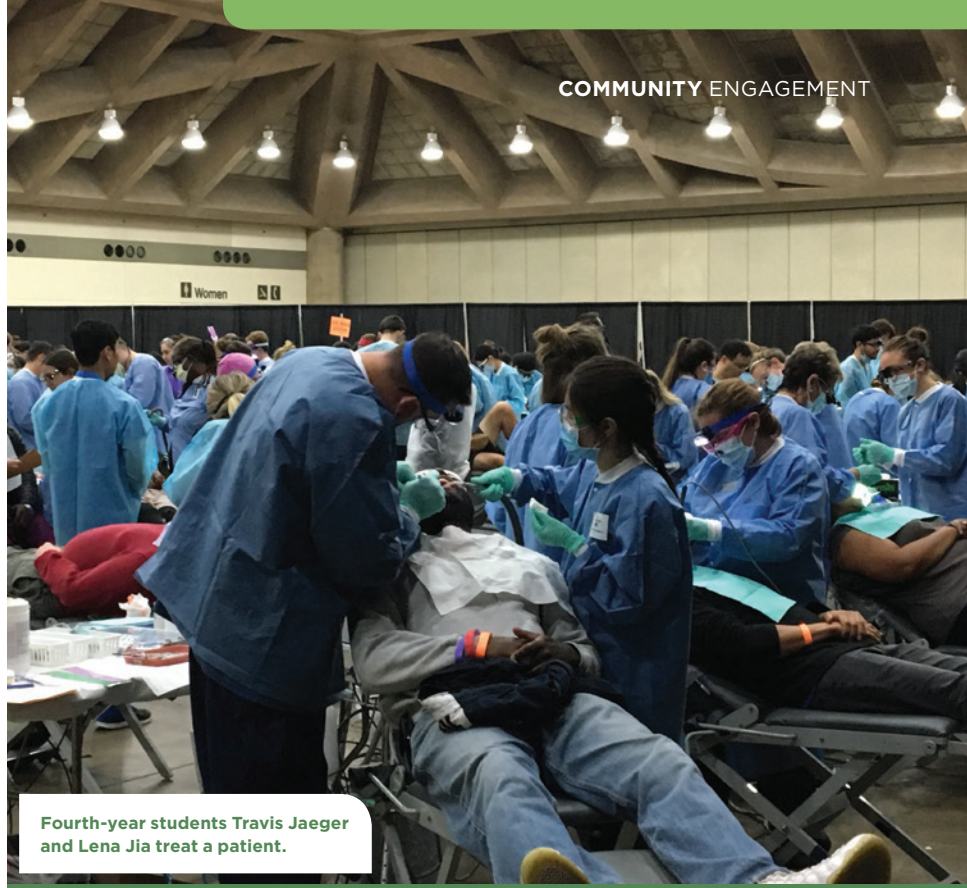
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3



4



Fourth-year students Travis Jaeger and Lena Jia treat a patient.

1 Dental hygiene students **Brittany Nigro**, left, and **Jaclyn Jameson** were among 275 UMSOD dental and dental hygiene students, faculty, and staff who participated in the community outreach project.

2 **Louis G. DePaola** (left) and **Ramsay Koury** oversaw UMSOD operations at the event.

3 UMSOD volunteers such as third-year student **Sean Young** (left) and fourth-year student **Wen Hu** provided care to nearly 950 patients.

4 Fourth-year student **Andrew Donald** signals that he is ready to help a patient by waving a red "filling" sign.

In addition to the United Way, UMSOD's other partners included the Maryland State Dental Association and Remote Area Medical. The unique social and health services collaborative received media attention from regional newspapers and TV stations as well as increased public interest on University of Maryland, Baltimore social media sites.

This was UMSOD's second year providing dental services at the Baltimore Mission of Mercy, and patient volume increased by about 35 percent, up from 701 patients treated last year. The event establishes a new model of treating a large number of patients who need critical oral health care and offers UMSOD students a chance to treat a wide range of patients, said UMSOD Dean Mark A. Reynolds, DDS '86, PhD.

"I am extremely proud of what the School of Dentistry volunteers accomplished at the Mission of Mercy," Reynolds said. "In just two days, we provided oral health services to more than 900 of our neighbors in need, with the bulk of care provided by our exceptional students." •

Multiyear Fundraising Campaign Kicks Off

STORY BY HOLLY SELBY



▲ From left, School of Dentistry Dean Mark A. Reynolds, professor Robert K. Ernst, and UMB President Jay A. Perman. Ernst was honored as the 2017 UMB Researcher of the Year.



▲ Dean Reynolds (third from left) and other deans and representatives of UMB's seven schools join President Perman onstage to launch the Catalyst campaign.

Big Ideas were the talk of the evening at the Founders Week Gala on Oct. 14, 2017.

The black-tie event, held annually to celebrate the University of Maryland, Baltimore (UMB), its people, and its accomplishments, this year also marked the launch of the Catalyst campaign, UMB's \$750 million, campuswide fundraising initiative.

Calling the multiyear campaign critical to securing UMB's future, President Jay A. Perman, MD, said the initiative will support University goals such as recruiting the most talented students and faculty and funding new research.

"While Catalyst will fund priorities specific to each of our seven schools," he said, "it also will support our Big Ideas — bold, interdisciplinary projects that depend on all of us working together."

At the University of Maryland School of Dentistry (UMSOD), the campaign will ensure that we continue to fulfill our mission of education, innovation, research, public service, and patient care, said Dean Mark A. Reynolds, DDS '86, PhD. "We are turning to our generous alumni and friends for help at this crucial juncture."

He added: "I am very pleased to announce that our fellow alumnus Charles A. Doring has agreed to chair UMSOD's Catalyst Campaign Committee. His leadership and ideas will prove invaluable as we achieve our goals."

Noting that the school instilled a work ethic he still utilizes today, Doring, DDS '87, MAGD, said, "Whether I am seeing patients at a long-term care facility or testifying on a

bill related to dentistry in Annapolis, I feel good about my foundation of learning from UMSOD.

"For the good of dentistry, I feel it is important to contribute back, to help the next generation entering our profession."

Campaign priorities include expanding clinical and translational research, developing online graduate programs in oral health sciences, and leading the way to a fully integrated health care landscape, the dean said.

Additionally, UMSOD plans to develop state-of-the-art clinics that will augment the school's existing clinical services by integrating the broad expertise within the school and across the health sciences campus.

Modeled on UMSOD's renowned oral and maxillofacial surgery practice, which already provides care to patients with complex surgical needs, the clinics will be housed on the school's redesigned first floor. "The new clinics will enhance the ability of our faculty experts to provide tailored, evidence-based treatments for patients requiring special or advanced care, as well as enriched opportunities for advanced education and training," Reynolds said.

Emceed by Denise Koch of WJZ-TV, the Founders Week Gala, which was held at the Hyatt Regency Baltimore, included award presentations and a performance by the Capitol Steps, a Washington, D.C.-based comedy troupe.

CHRIS ZANG CONTRIBUTED TO THIS ARTICLE.



FOR MORE INFORMATION

about the Catalyst campaign, visit <http://catalyst.umaryland.edu/>.

FROM THE BOARD OF VISITORS



Having graduated from this school 52 years ago, I cannot tell you how exciting a time this is to be an active part of its family.

In recent months, we have been successful in recruiting world-class faculty who had offers or positions at other elite institutions but chose to teach at the University of Maryland School of Dentistry.

We also celebrated longtime faculty member Robert K. Ernst, PhD, professor and vice chair of the Department of Microbial Pathogenesis, who in October was named the University of Maryland, Baltimore (UMB) Researcher of the Year. Presented by UMB President Jay A. Perman, MD, this honor is bestowed upon only one member of our health sciences campus annually.

The School of Dentistry's applicant-to-enrollment ratio remains among the country's highest. Last year, 2,769 applicants applied for the 130 openings in the current first-year class. We are

attracting and retaining the best of the best. This year, the bar will be raised even higher.

We also celebrate Marion C. Manski, RDH, MS, associate professor and director of the Dental Hygiene Program, who received national recognition when she was presented with the 2017 Irene Newman Professional Achievement Award by the American Dental Hygienists' Association.

And in Fiscal Year 2017, our development efforts produced 103 percent of our fundraising goal, and we are working hard to make FY 2018 even more successful. Funds generated by alumni, friends, and corporate entities are very important; these donations, scholarships, and grants enable us to provide the education and patient services necessary to operate our school and maintain the level of excellence to which we are accustomed.

I cherish the relationships and the opportunities my school has provided me. I'm always amazed that I get back more than I give.

Melvin F. Kushner, DDS '66

Chair | Board of Visitors

FROM THE ALUMNI ASSOCIATION



Our All-Alumni Reunion, scheduled for June 8-9, is fast approaching and, of course, the chance to visit with longtime friends and make new ones is on my mind.

Through my role as president of the Alumni Association Board of Directors, I am constantly reminded of the value of the friends and connections I've made through the

University of Maryland School of Dentistry (UMSOD). One of my goals has been to work with the board to strengthen existing relationships and develop new ways for all of our members (including students as future alums) to connect and form meaningful bonds.

At the start of the academic year, the board sponsored an orientation luncheon for incoming first-year students. Several alums were on hand to welcome the newest class of dental students to campus and offer tips about how best to succeed. We're planning another event as part of orientation in August, and you are welcome to participate. As we complete our plans, we'll send you details in our monthly alumni newsletter.

At the end of the fall semester, Bradley A. Trattner, DDS '88, and I organized a bagels-and-coffee gathering for students during exam week. We knew that the event would offer students a chance to relax in the midst of their studies, and—every bit as important—it also would provide us with an opportunity to meet with students, trade dental school stories, and form the beginnings of relationships.

From my conversations that day, it seems clear that the more we alumni can welcome and connect with students, the more immersed and invested they'll be in UMSOD.

I hope you'll help us form those bonds—and enjoy yourself while doing so—by volunteering as a Dean's Faculty member, attending future alumni-sponsored student events, or coming back to campus in June for the All-Alumni Reunion. The strength of our alumni network will bolster our younger alums as they build successful careers and, ultimately, benefit our alma mater.

I hope to see you in June. For information about what we have planned, visit www.dental.umaryland.edu/reunion.

Adam Eisner, DDS '89

President | Alumni Association Board of Directors

PLAYING CATCH-UP

Throughout the year, the UMSOD hosted receptions at many of the professional conferences and conventions held across the country. About 200 alumni attended to reminisce with longtime friends and trade dental school experiences with new acquaintances at the . . .



2018 Yankee Dental Congress Convention in Boston



PHOTO BY JANET WILEY

2017 National Dental Association Convention in Dallas



PHOTO BY JAMIE MYERS

2017 American Dental Association Annual Meeting in Atlanta



2017 Chesapeake Dental Conference in Ocean City, Md.



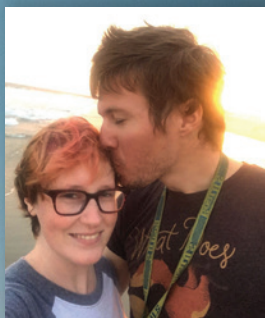
2017 American Academy of Pediatric Dentistry Annual Session at National Harbor near Washington, D.C.

FOR MORE INFORMATION about upcoming UMSOD receptions, contact the Office of Advancement at dentaladvancement@umaryland.edu.

BEYOND THE WHITE COAT

Harry H. “Herb” Benavent, DDS ’12

BY GWEN NEWMAN



Harry H. “Herb” Benavent, DDS ’12, is living his dream: The dentist and his wife set sail last summer on a picturesque journey that promises amazing sunrises, starry skies, and untold adventures.

“Being out here is a whole other world,” says Benavent, who spoke last fall by phone from his floating home just offshore Beaufort, N.C. “Seeing the wonders of nature. At night, you float on a sea of stars. It’s gorgeous.”

At the time, the couple had traveled about 300 miles south of Baltimore on their 45-foot cutter rig (equipped with tanbark sails and an electric motor). They’d initially planned a quicker trek but slowed their pace, better to see the sights.

Their journey began July 10 when they departed Baltimore, sailed the Chesapeake Bay, and headed into the Atlantic. During the winter holidays, they took a break from the water and returned to Baltimore to reconnect with family and friends. In January, they set sail again with plans to head first to Bermuda, then sail to Europe, through the Mediterranean, and along the African coast—with no set date for their return.

The decision to take an indefinite hiatus from their full-time jobs wasn’t an easy one, says Benavent, who, when on land, works at his family’s practice in Clarksville, Md. Indeed, Benavent comes from a long line of oral health professionals—and University of Maryland School of Dentistry alumni. His grandfather, Arturo Benavent, DDS ’45, and his father, Harry Benavent, DDS ’81, are dentists. His sister, Vanessa Benavent, DDS ’09, is a dentist and president of the Maryland State Dental Association. And his mother, Deborah Benavent, RDH ’80, is a dental hygienist.

Like most in his generation, Herb Benavent was groomed to work hard, then retire and follow his dreams. Nevertheless, he and his wife, Maddie, both thought “you have to live your dreams while you are young, healthy, and alive.”

One of Benavent’s favorite memories—and one that led him to choose dentistry as his profession—is of hearing a patient ask his father, “When are you going to start?” The irony? The procedure was already completed.

“I realized then that dentistry is not like in the movies [which frequently show patients in pain]. And dentistry is perfect for me,” Benavent says. “I really like working with my hands and problem-solving. Every case is different, and there’s no clear answer—you have to figure it out.”

A lifelong boater, Benavent vividly remembers reading a how-to book called *The Capable Cruiser* and becoming infatuated with the idea of heading out to sea. After graduating in 2012, he purchased a nearly 50-year-old sailboat, docked it in Baltimore’s Inner Harbor, and moved aboard with his dog and his parrot.

During these years, he also met Maddie, an artist who taught at Broadneck High School in Annapolis, Md., and they married in 2016. Initially, Benavent says, his wife wasn’t keen on cruising the seas. “She actually said, ‘No chance in hell,’” the dentist recalls with a laugh.

Eventually, her experiences aboard the vessel and within the boating community won her over. Benavent took a hiatus from his family’s dental practice, and Maddie quit her day job.

At least once a day, they post photos and videos of their adventures on Instagram, YouTube, and an online hub for all to view from afar the lives of two who dared to chase their dreams.

You can learn more about the Benavents’ journey at www.youtube.com/riggingdoctor. •

CLASS NOTES

1951

Paul Torre, DDS, retired from private practice. He was a practicing dentist until the age of 90.

1973

Robert J. Bray, DDS, won the Distinguished Service Award for meritorious service from the American Association of Orthodontics.

Barry Setzer, DDS, received a Public Service Award from the Florida Dental Association (FDA) for his humanitarian service on behalf of the state of Florida. The honor was presented in June 2017 during the FDA's annual meeting in Orlando.

2004

Wayne Kye, PERIO, was elected vice chair of the New York State Board of Dentistry.



Wayne Kye

2010

Darien Weatherspoon, DDS, accepted a position as director of the Health Disparities Research Program, Office of Clinical Research, at the National Institute of Dental and Craniofacial Research.



Darien Weatherspoon

2013

Michael D'Amico, DDS, graduated in June 2017 from the residency training program at Christiana Care Health System in Delaware. He joined his father, Eugene M. D'Amico III, DDS '83, in the practice of oral and maxillofacial surgery in Newark and Middletown, Del. He married Brittany Kozitzky on Dec. 31, 2016.



Michael D'Amico



ALUMNA ELECTED PRESIDENT OF AMERICAN DENTAL HYGIENISTS' ASSOCIATION

Michele Braerman, RDH '92, BSDH, is the president-elect of the American Dental Hygienists' Association (ADHA). She will be installed as president June 25 at the ADHA's 95th Annual Conference in Columbus, Ohio. To mark the occasion, the University of Maryland School of Dentistry (UMSOD) plans to host a "Reception of Recognition" at the conference on June 21 at 10:30 a.m.

Braerman graduated from the University of Maryland, College Park in 1984 with a Bachelor of Science degree in kinesiology. She graduated from UMSOD in 1992 and has been active in her professional association during her career, taking several leadership roles. A resident of Fallston, Md., she works as a clinician in a private practice and previously held a post as adjunct clinical instructor at the Community College of Baltimore County.

"I am a team player. I believe that you can get more accomplished with collaboration," Braerman says. "As president, I'll work with ADHA's board of trustees and the membership to support dental hygiene professionals throughout their careers and advocate for the profession. Dental hygienists must be valued and integrated into the broader health care delivery system."

Braerman's immediate priorities include overseeing the implementation of the ADHA's strategic plan, adopted in 2016, which states its core ideology is to "unite, empower, and support the dental hygiene profession."

For more information or to RSVP to attend UMSOD's June 21 reception in honor of Braerman, contact Jamie Myers at jamiemyers@umaryland.edu.

HAVE NEWS YOU'D LIKE TO SHARE?

Please let us know at 410-706-1333 or shesel@umaryland.edu.





CATALYST

A person who causes action | An agent of change | A stimulus, spark, or incitement

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- ▶ Endow chairs and professorships,
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For information about how you can be a catalyst, please contact us:

***Catalyst.umaryland.edu* or 410-706-7146.**

in MEMORIAM

We are saddened by the loss of the following alumni and friends:

Marcos H. Barrera, DDS '65
 George A. Bealefeld, DDS '73
 Richard L. Behan, DDS '67
 Ronald S. Branoff, DDS '66
 Martin D. Breckstein, DDS '59
 Gary H. Cohen, DDS '59
 Maury J. Fechter, DDS '73
 Christopher L. Fisher, DDS '79
 Neil R. Gottehrer, DDS '71
 Ronald W. Higel, DDS '61
 Stuart D. LaKind, DDS '56
 Martin Magaziner, DDS '60
 Stanley R. Mallow, DDS '51
 Pete N. Nickolas, DDS '75
 Fred J. Quarantillo, DDS '73
 Howard B. Rosen, DDS '51
 Albert S. Schaffer, DDS '57
 Robert T. Scott, DDS '69
 Joseph H. Seipp Jr., DDS '55
 Irvin M. Sopher, DDS '62
 Jack H. Soutar, DDS '56
 Lloyd E. Svennevig, DDS '56
 Michael John Tabacco, DDS, *faculty*

Robert T. Scott, DDS '69



Robert T. Scott, DDS '69, a longtime orthodontist, humanitarian, and vineyard owner, died June 30 of complications from a fall. He was 73.

A 1966 graduate of Western Maryland College (now McDaniel College), Scott graduated *summa cum laude* from the University of Maryland School of Dentistry (UMSOD). He served in the U.S. Navy Dental Corps before earning a master's degree in orthodontics at

Georgetown University School of Dentistry and going into private practice.

When he retired after more than 40 years as a practicing orthodontist, Scott owned six offices in the Westminster, Md., area. He also had been a diplomate of the American Board of Orthodontics since 1985, served as a clinical assistant professor at UMSOD since 2002, and was a frequent volunteer who provided much-needed oral care services around the world.

His passion for serving those in need took him on dental missions to Costa Rica, Ecuador, Morocco, and Kenya, and in recognition of his dedication, he was inducted into the International College of Dentists. Scott collaborated with the Commission on Missions Dental Team, the Ecuadent Foundation, and Operation Smile, for example, to offer his assistance.

In his community, Scott helped establish the first Montessori School in Westminster and served as president of the Westminster Rotary Club, chair of the Industrial Development Authority of Carroll County, and on several committees at Westminster United Methodist Church.

Scott's tireless service and numerous contributions didn't go unnoticed. In 1977, the Westminster Jaycees honored him with its Distinguished Service Award. In 1993, he was named a Rotary International Paul Harris Fellow. In 2007, the Community Foundation of Carroll County honored Scott and his family with its Philanthropist of the Year Award. And in 2012, his Rotary Club jointly presented Scott and his wife, Carolyn, with the Citizen of the Year Award.

As his wife of 37 years told the *Carroll County Times*, Scott will be remembered particularly for his professionalism, generosity, and leadership as well as a love of skiing, scuba diving, underwater photography, and winemaking. (Carolyn gave him 40 grapevines as a wedding present in 1980.) In addition to his wife, Scott is survived by two children, two stepchildren, a sister, and eight grandchildren.

TO READ MORE

about Robert T. Scott's winemaking, see the Summer 2014 issue of *Mdental* at www.dental.umaryland.edu/mdental/.

CONTINUING EDUCATION COURSES

➤ **Nitrous Oxide Administration
and Monitoring for the
Practicing Dental Hygienist**

*Presented by
Deborah Cartee, RDH, MS*

Saturday, May 12
8 a.m. to 3:30 p.m.

➤ **Infection Control Is Not Optional/
Proper Pharmacologic Prescribing
and Disposal/Scope of Abuse**

*Presented by
Louis G. DePaola, DDS, MS;
Richard L. Wynn, PhD;
Christine Wisnom, RN, BSN*

Saturday, May 19
8 a.m. to 4 p.m.



FOR MORE INFORMATION

For more information about our continuing education courses, all held at the University of Maryland School of Dentistry, call 410-706-2282 or visit www.dental.umaryland.edu/ce.



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Friday, June 8 - Saturday, June 9

2018

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for more information.



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