

2023 ANNUAL REPORT

Wilmer



Wilmer Eye
Institute

TRANSFORMATION

**HOW WILMER'S INNOVATIVE RESEARCHERS
AND CLINICIANS ARE CHANGING LIVES —
AND THE FIELD OF OPHTHALMOLOGY**



As I See It...

Dear Friends,

Beginning with the philosophy of our founder, Dr. William Holland Wilmer, who believed that integrating research, teaching and patient care under one roof would make us better researchers, teachers and doctors, the Wilmer Eye Institute has demonstrated how thought leadership leads to innovation. For nearly a century these elements have worked symbiotically, enabling us to advance our understanding of disease, develop cutting-edge therapies and train future generations of ophthalmology leaders.

But there's another element that has played an integral role in the progress we've made, and that is philanthropy. In fact, it was a grateful patient of Dr. Wilmer, Aida Breckinridge, who raised the funds to found this great institution and start the proverbial ball rolling.

**“LIKE MRS. BRECKINRIDGE,
MR. PICKENS UNDERSTOOD
BOTH THE POWER OF DISEASE TO
STEAL SIGHT AND THE POWER
OF GIVING TO BRING ABOUT
TRANSFORMATIVE CHANGE.”**

This year, Wilmer received one of the largest gifts in its history from the estate of T. Boone Pickens. Like Mrs. Breckinridge, Mr. Pickens understood both the power of disease to steal sight and the power of giving to bring about transformative change.

Thanks to the generous support of people like Mrs. Breckinridge and Mr. Pickens, where many diagnoses once meant an inevitable loss of sight, we now have therapies that can slow, halt or even prevent damage from eye disease — and many other breakthrough treatments are just on the horizon.

Today, technology is transforming our ability to provide care in ways we once only dreamed of. In these pages, we look at some of the many innovative applications of artificial intelligence under investigation at Wilmer. We also share the personal stories of people whose lives were instantly transformed by trauma and transformed anew by our highly skilled surgeons who are trained to put back the pieces when the unthinkable happens. And we look at how those with generosity and foresight can use their gifts, large and small, to advance the study of blinding eye diseases and the search for treatments that can transform lives.

Yours sincerely,

PETER J. McDONNELL, M.D., Director



ON THE COVER

Optical coherence tomography angiography (OCTA) is rapidly changing the way researchers and clinicians detect and follow the development of eye disease. Transformative technologies like OCTA provide tools for detecting *in vivo* biological changes at nearly cellular level resolution that occur long before the onset of symptoms and clinically definable disease.

The cover depicts an ultra-widefield OCTA image, which shows areas of subclinical capillary loss that define diabetic retinopathy. The research team of Amir Kashani, M.D., Ph.D., the Boone Pickens Professor of Ophthalmology, is implementing transformative technologies like OCTA into clinical and research programs that can help redefine our understanding of disease and open new pathways for treatment.

Image courtesy of Kashani Lab, Wilmer Eye Institute



The mission of the Wilmer Eye Institute, Johns Hopkins Medicine, is to transform medical outcomes in the field of ophthalmology through collaboration and innovation, resulting in compassionate, leading-edge, patient-informed care.

With an unwavering dedication to our founding vision, Wilmer offers:

- A humane approach to patient care
- A breadth of leading solutions
- A deep investment in research
- A track record of producing leaders in the field of ophthalmology

Collaborative and purpose-driven, the Wilmer Eye Institute understands the critical importance of sight, an essential part of the human condition.

Inside

- 2 Highlights
- 6 Transformation:
Wilmer is changing lives and changing the field
- 8 A Transformative Gift
- 12 Leading the AI Ophthalmology Revolution
- 18 In an Instant
- 22 An Avid Gardener's Gift for Growth
- 24 United by a Patient-Centered Philosophy
- 26 Expanding Accessibility in
Neuro-Ophthalmology Care
- 28 2023 Events
- 32 2023–2024 Residents
- 33 Thank You to Our Donors
- 38 Wilmer Board of Governors



CARING FOR PATIENTS

9 Clinical Locations 



263,000+ Patient Visits Annually



14,000 Major Surgeries Annually

15,222 Same Day Appointments




375,636 Phone Calls

DEDICATED TO RESEARCH

5 Core Research Centers

Animal Module for Wilmer Core • Bioinformatics Center • Biostats Center
Drug Delivery and Nanotechnology • Microscopy and Imaging



700+ Peer-Reviewed Papers Published in 2022

A recent study published in *JAMA Ophthalmology* identified Wilmer as having the most highly cited ophthalmic journal articles of any institution.



POWERED BY COLLABORATION*



41 Scientists

66 Physician-Scientists

29 Optometrists

16 Clinical Fellows

20 Residents

31 Nurses

438 Staff/Technicians

78 Students

719 Grand Total

* Full-time staff

BRIGHT SPOTS IN 2023 FROM WILMER

HIGHLIGHTS



THE WILMER WAY — RECOGNIZING EXCELLENCE

Wilmer Eye Institute was once again recognized as a top-ranked ophthalmology program by the *U.S. News & World Report* annual survey. Wilmer was also ranked #1 in Ophthalmology by *Expertscape*, which determines its rankings based on peer review. Wilmer-Columbia was named **Best of Howard 2023**. Results of the annual “Best of” readers’ poll are featured in *Howard Magazine* and the *Howard County Times*. This marks the 10th consecutive year Wilmer-Columbia has received this honor.



GUEST OF HONOR

Wilmer Director Emeritus **Morton F. Goldberg, M.D.**, was the guest of honor at the 2023 Annual Retina Society Meeting, held October 11–14 in New York [above]. Goldberg was also honored on September 29 with the Johns Hopkins Medicine Sickle Cell Center for Adults Distinguished Service Award for Clinical Care, Research and Education.

BETHESDA MAGAZINE’S 2023 TOP DOCTORS



Clockwise from left: Courtney Kraus, M.D., Nicholas Mahoney, M.D., Shameema Sikder, M.D., and Adam Wenick, M.D., Ph.D., were named Top Doctors of 2023 by *Bethesda* magazine.



NEW OPPORTUNITIES IN OPTOMETRY

Wilmer debuted its **Optometry Residency Program**, with its first resident, **Bradley Salus, O.D.**, matriculating in July. The new program will train optometrists in primary care optometry and provide an additional teaching opportunity for the institute's optometry faculty.

HONORING IMPACT

Wilmer Board of Governors Chair **Sanford Greenberg, Ph.D.**, was presented with the Centennial Medal, the highest honor bestowed by Harvard University's Graduate School of Arts and Sciences, reserved for "alumni whose contributions to knowledge, to their disciplines, to their colleagues, and to society at large have made a fundamental and lasting impact."



RISING WOMEN IN SCIENCE

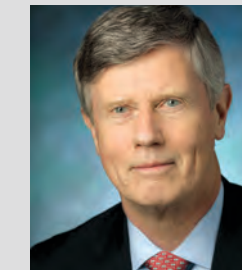
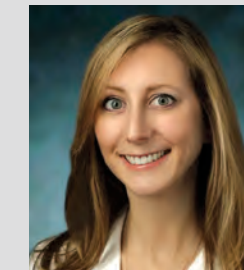
Laura Ensign, Ph.D., was recognized by the Controlled Release Society as the 2023 Rising Women in Science honoree. The society grants this honor to a woman scientist with fewer than 10 years of post-Ph.D. experience who is dedicated to excellence in science, leadership and the promotion of women in their communities.

AMERICAN ACADEMY OF OPHTHALMOLOGY HONORS

Clockwise from left: Ophthalmology Residency Program Director **Fasika Woreta, M.D., M.P.H.**, received the American Academy of Ophthalmology/Association of University Professors of Ophthalmology 2023 Straatsma Award for Excellence in Resident Education. It is the highest award given to an ophthalmic educator by the Academy. **Sharon Solomon, M.D.**, received an AAO Secretariat Award for her work on the Task Force and Sub-Task Force on Disparities in Eye Care, and **Divya Srikumaran, M.D.**, received an AAO Secretariat Award for her efforts as a reviewer for the Academy's journal, *Ophthalmology*. **Megan Collins, M.D., M.P.H.**, received a 2023 Honor Achievement Award for her contributions to the Academy, its scientific and education programs and to ophthalmology.



NEWSWEEK'S AMERICA'S BEST EYE DOCTORS 2023



Esen Akpek, M.D.; **Corinne Casey, O.D.**; **Douglas Jabs, M.D., M.B.A., M.S.**; and **Pradeep Ramulu, M.D., Ph.D.**, were named to Newsweek's list of "America's Best Eye Doctors 2023."

LEADERS & LEGENDS

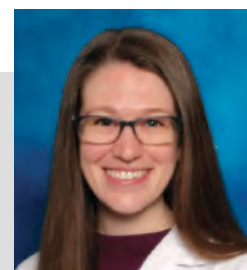
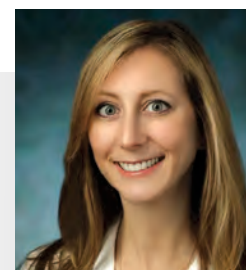
Neil Bressler, M.D., **Susan Bressler, M.D.**, and **Morton F. Goldberg, M.D.**, were featured as History of Retina's Leaders & Legends. Sponsored by the American Society of Retina Specialists, the series identifies "inspiring visionaries whose pioneering spirit and passion led to advances in retinal science and technology that have revolutionized patient care and improved the lives of millions with retinal disease."



INNOVATIVE LEADERSHIP



Justin Hanes, Ph.D., was elected to the National Academy of Medicine. Hanes was recognized for pioneering discoveries and inventions of innovative drug delivery technologies, especially mucosal drug delivery systems; and for international leadership in research and education at the interface of engineering, medicine and entrepreneurship, leading to clinical translation of drug delivery technologies.



TWO NEW CLINIC DIRECTORS

Corinne Casey, O.D., was named clinic director of Wilmer-Odenton, and **Kelly Seidler, O.D.**, became clinic director of Wilmer-Frederick.



A WALL OF SUPPORT

The original "Professorship Wall" in the Robert H. and Clarice Smith Building honors the recipients of 51 professorships at Wilmer and the generous donors whose support has made those professorships possible. This year, Wilmer had the happy occasion to add a new wall to accommodate the growing number of professorships. The new Wilmer Professorship Wall is a tangible sign of the tremendous support Wilmer has received over many years and the great impact that these professorships have on faculty members' work.



TRANSFORMATION

Clinician-scientists at the Wilmer Eye Institute have led the way in improving treatments for eye disease since the institute's very founding, but the pace of their progress has picked up dramatically in recent years, driven largely by rapid advances in technology. In the stories that follow, you'll learn how promising researchers are pushing the boundaries of the latest technologies to open exciting new avenues for treatment — and ultimately transform lives — while keeping patient-centered care at the core of everything they do.

You'll also learn about the transformative generosity of just some of the people whose collective vision has proven so crucial to advancing Wilmer's life-changing mission.

A TRANSFORMATIVE GIFT

One of the largest gifts in Wilmer's history will fund vision-saving research and professorships.

By Amy Entwisle



Opposite page:
T. Boone Pickens
in the atrium
that bears his
name, 2013

Growing up in a small town in Oklahoma, T. Boone Pickens learned his work ethic and generosity from his parents and grandparents. They didn't have much, but they always gave, he often said.

Pickens, who went on to achieve great success as an innovative entrepreneur, was known for both his shrewd business acumen and his generosity. In his lifetime, he made over \$1 billion in philanthropic contributions to advance — among other things — medical research, conservation and education, all of which he valued greatly.

In August, the Wilmer Eye Institute received a \$20 million donation from the T. Boone Pickens Foundation. The legacy gift, first pledged in 2013 by the late Texas energy leader, is one of the largest in Wilmer's history and will fund vision-saving research and professorships.

Pickens' interest in the research and treatment of eye disease developed in the 1980s after his father's diagnosis of macular degeneration, then the leading cause of blindness in the United States. At the time, no treatments existed to prevent his father from losing his vision. Later, when Pickens developed macular degeneration, he sought treatment at Wilmer for that condition and cataracts. Pickens' care

team included **Walter Stark, M.D.**, and **Neil Bressler, M.D.** "Walter Stark, like my dad, had deep Oklahoma roots," says Pickens' daughter, Liz Cordia. "They became fast friends. This friendship ultimately evolved into Walter treating my granddad's glaucoma and my dad's cataracts and later diagnosing his macular degeneration."

By that time, research had led to treatment for macular degeneration in the form of injections of anti-vascular endothelial growth factor into the middle cavity of the eye. As a result of the care he received at Wilmer, Pickens retained most of his eyesight until his death in 2019 at the age of 91.

"One of the pleasures of this revolutionary treatment, which often requires monthly monitoring, is that you really get to know the patients," says Bressler, the James P. Gills Professor of Ophthalmology. "Boone not only was a great businessman and philanthropist, he also was a great storyteller. He always had a new story. It might relate to something going on in politics or in business, but it always had humor and a lesson in life and human nature to be considered. He learned a lot about retinal disease from me, but I learned a lot more about the oil business and life from him."





At Wilmer, Pickens came to know many of the members of his care team by name and was known to send personal notes of thanks to them over the years. “Mr. Pickens would treat every staff member, front desk associate, technician, photographer, physician and nurse with the highest degree of respect and consideration,” recalls ophthalmic photography manager **Dennis Cain, C.R.A.** “I very much admired his down-home, friendly sense of humor. He reminded me so much of my own grandfather: kind, generous, humorous.”



T. Boone Pickens, center, surrounded by Wilmer's perioperative nurses in 2013

The gift is actually Pickens' third to Wilmer and brings his support of the institution to more than \$28 million. In 2005 and 2009, Pickens made gifts totaling \$8 million — first to establish the Boone Pickens Professorship in Ophthalmology, currently held by **Amir Kashani, M.D., Ph.D.**, and then to help with construction of the Robert H. and Clarice Smith Building to house Wilmer's research laboratories and state-of-the-art operating rooms.

“Mr. Pickens' generous contributions to Wilmer will serve as the foundation on which teams of clinicians, scientists and engineers will develop novel diagnostic and therapeutic interventions to prevent blindness and improve the health of people around the world,” says Kashani.

In addition to supporting cutting-edge research and the Boone Pickens Professorship, the \$20 million gift from the Pickens Foundation will endow additional professorships, specifically for young investigators, called Rising Professorships. The funds will be allocated to researchers who conduct novel, vision-saving research that may be overlooked by other potential funding opportunities.

“The Pickens Rising Professors will be our best and brightest physician-scientists who are early in their careers and exploring their new ideas for improving the care of patients and ending blinding eye diseases,” says Wilmer Director **Peter J. McDonnell, M.D.**, the William Holland Wilmer Professor of Ophthalmology, “This transformative gift from our friend, Mr. Pickens, will accelerate our work in artificial intelligence, stem cells, nanotechnology and other exciting new frontiers.”

Pickens Foundation representative Jay Rosser says Pickens believed in making a generational impact with his giving. “He wanted to train researchers and doctors of the future who could provide quality care for decades, hopefully hundreds of years going forward. And I think all of these gifts had that intended consequence,” says Rosser. ●



SUPPORTING GROUNDBREAKING RESEARCH

Amir H. Kashani, M.D., Ph.D., the Boone Pickens Professor of Ophthalmology, is lead investigator of the Optical Coherence Tomography Angiography Initiative in several multicenter studies funded by the National Institutes of Health and the BrightFocus Foundation. These studies aim to develop a clinically useful biomarker of retinal capillary changes to monitor the development of a prevalent form of systemic vascular disease and cerebrovascular disease, known as vascular cognitive impairment and dementia — one of the leading types of cognitive impairment, likely on par with Alzheimer's disease.

Kashani is also a lead investigator for the first clinical trial in humans to test a novel stem cell therapy for severe vision loss

from advanced dry age-related macular degeneration and geographic atrophy. For this study, he and the research team pioneered a novel surgical procedure to insert a monolayer of healthy stem cell-derived retinal pigment epithelium (RPE) to replace the damaged RPE in patients with these conditions.

In 2016, he was named one of the top 150 innovators in the field of medical and surgical retina by *Ocular Surgery News*. In 2017, he was named one of the top 50 “rising stars” worldwide in the field of ophthalmology by *The Ophthalmologist*. Kashani's work has been recognized by multiple organizations and publications, including *Investigative Ophthalmology and Visual Science*, *Science Translation Medicine*, *Alzheimer's and Dementia* and *Best Doctors in America*.

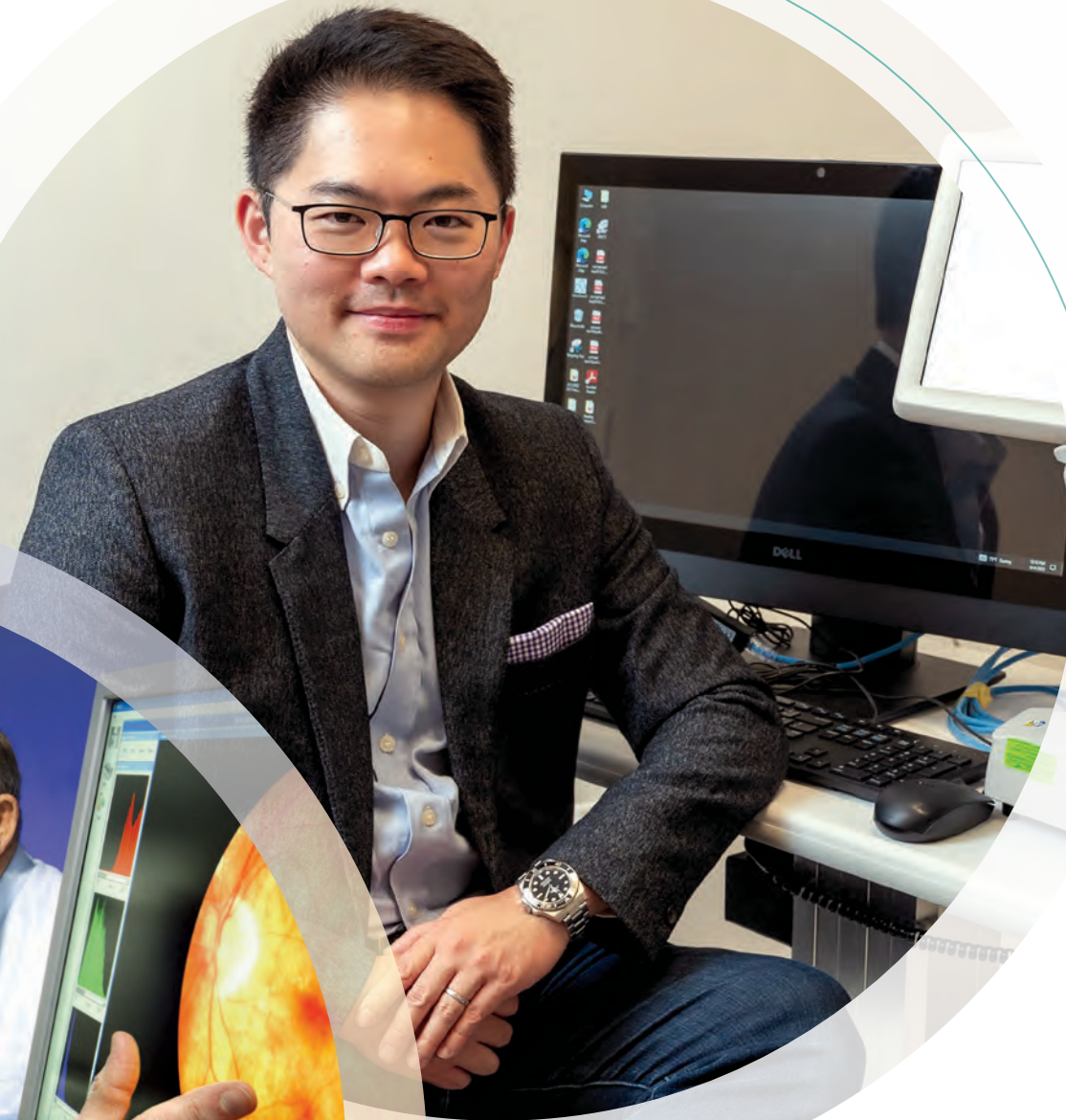
Left to right: Peter Gehlbach, Elizabeth Cordia, Peter J. McDonnell, Jay Rosser, Amir Kashani, Dennis Cain. Gehlbach, the J. Willard Marriott, Jr. Professor of Ophthalmology, is a longtime friend of the Pickens family.



LEADING THE AI OPHTHALMOLOGY REVOLUTION

Wilmer's expansive focus and deep bench are advancing the understanding and application of artificial intelligence tools.

By Jessica Wilson



Left: Neil Bressler
Right: T.Y. Alvin Liu

While artificial intelligence suddenly seems to be everywhere, physician-scientists at Wilmer have been developing and evaluating AI tools for years. What started with one project by **Neil Bressler, M.D.**, in partnership with the Johns Hopkins Applied Physics Lab (APL), has multiplied in number and complexity. Today, AI-related projects at Wilmer encompass everything from precision medicine to surgical training to drug discovery, with many patients and faculty members benefiting from the unique, collaborative environment at Johns Hopkins.

“What sets Wilmer apart from other academic eye centers is the breadth of projects using artificial intelligence,” says **T.Y. Alvin Liu, M.D.**, director of Wilmer’s Precision Ophthalmology Center of Excellence. “We also have a deep bench of investigators involved in the entire life cycle of AI projects, from fundamental model design to translating data into useful AI clinical decision tools, and from implementation of FDA-approved AI tools on a health system level to the ethical and societal considerations of AI technology.”

MONITORING FROM A DISTANCE

Fundus photographs can reveal subtle changes in the eye and are used to diagnose and monitor patients with conditions such as age-related macular degeneration, diabetic retinopathy and diabetic edema. To determine if treatment is working or if a disease is progressing, best corrected visual acuity (BCVA) is also closely monitored. Considered the gold standard for measuring someone’s vision, BCVA is assessed in the clinic following

refraction. But for patients undergoing treatments for common retinal diseases, measuring BCVA might be of value as often as monthly — time-consuming for ophthalmologists in short supply, and inconvenient or logistically challenging for many patients.

When Bressler, the James P. Gills Professor of Ophthalmology, learned that certain AI algorithms were able to estimate the age of a patient based on reading fundus photographs of their retinas, he had an idea. Could a fundus photograph provide the BCVA of a patient?



“We discovered AI could estimate BCVA from fundus photographs without refracting human beings or having them read an eye chart.” – NEIL BRESSLER

He and his team constructed an AI algorithm to read fundus images of patients and estimate their BCVA. They validated these estimates from known BCVA measurements matched to fundus photographs. “We discovered AI could estimate BCVA from fundus photographs without refracting human beings or having them read an eye chart — usually within 10 letters [on a standardized eye chart] of the actual BCVA. Recent work is getting close to the goal of within 5 letters across many retinal diseases,” Bressler says. That means an AI algorithm evaluating retinal images could be as accurate as BCVA determined by a clinical exam, saving time and money. Bressler envisions a day when patients could use smartphones to acquire fundus images of their retinas that would estimate BCVA. Patients could check this BCVA as often as needed from their home. Their physicians could receive more frequent, accurate information — allowing ophthalmologists to monitor more people and at greater distances from their clinics.

IMPROVING OUTCOMES + HEALTH EQUITY

A disease with wide-reaching and potentially devastating consequences is diabetic retinopathy, which is caused by damage to blood vessels in the retina. Because early detection can be sight-saving, patients with diabetes should be screened annually by an ophthalmologist. The screening, though vision-saving for many patients, can be burdensome because it requires a separate trip to the eye doctor. As a result, many patients simply do not get their annual screenings. Since 2020, Johns Hopkins Medicine has deployed an FDA-approved autonomous AI screening device for diabetic retinopathy in primary care physicians’ offices, with Wilmer playing a pivotal role in the implementation process. “The doctor checks your A1C levels, and right then and there, you get your retinal photographs taken. In real time, those photos are analyzed by an AI model that can tell right away whether you have diabetic involvement in the back of the eye,” says Liu. “It’s a one-stop shop.” A research team at Wilmer led by Liu has been studying the effectiveness of the devices. “It significantly improved the adherence rate when it comes to annual diabetic retinopathy screening. And specifically, it improved the adherence rate for at-risk populations,” says Liu. “We showed that we improved outcomes and health equity on a population level.”



Jithin Yohannan

PREDICTIVE MEDICINE, CUSTOMIZED CARE

If one impetus for using AI is its wide reach, another is its precision. Several years ago, using a database of visual field tests, **Jithin Yohannan, M.D., M.P.H.**, constructed an AI algorithm to predict which patients were at risk for rapidly progressing glaucoma based on their very first field test, which measures how wide of an area your eye can see. The algorithm achieved 90% accuracy. Yohannan is now inputting additional factors — optical coherence tomography images of the optic nerve, clinical information such as intraocular pressure, and demographic information — into training the algorithm to see if it can predict with even greater performance which patients will progress faster.

“It could essentially give us customized recommendations and estimated impacts of treatment decisions on very specific patients.” – JITHIN YOHANNAN

“The next step is developing a model that can predict what course of treatment would be best for the patient sitting in front of you. It could essentially give us customized recommendations and estimated impacts of treatment decisions on very specific patients,” says Yohannan.



AI FOR THE SURGEON

A global challenge is the shortage of highly trained ophthalmologists who can perform sight-saving surgeries. **Shameema Sikder, M.D.**, the L. Douglas Lee and Barbara Levinson-Lee Professor of Ophthalmology, leads an NIH-funded research team in developing AI to analyze surgeons' performance using surgical videos, and provide feedback to surgeons. The AI is expected to shorten the time surgeons take to acquire skill and reduce variation in skill across surgeons who are in training and in practice.

As the director of the Center of Excellence for Ophthalmic Surgical Education and Training (OphSET) at Wilmer, Sikder aims to implement AI to influence how surgeons are trained in the future. With additional support

from a Microsoft for Startups grant, Sikder's team has developed a cloud-based platform, Circlage, for surgeons to use the AI analytics to acquire skill. Sikder's team, including collaborators from the Malone Center for Engineering in Healthcare and the Whiting School of Engineering, are now working on AI to provide surgeons personalized feedback to optimize skill, with the goal of elevating standards of surgical care globally. Recently, the team received a Maryland Innovation Initiative Award to commercialize Circlage.

AI is expected to shorten the time surgeons take to acquire skill and reduce variation in skill across surgeons who are in training and in practice.

Shameema Sikder, above right, oversees surgical training at the Center of Excellence for Ophthalmic Surgical Education and Training.

TARGETED THERAPIES

Laura Ensign, Ph.D., the Marcella E. Woll Professor of Ophthalmology, and her team at Wilmer's Center for Nanomedicine, focus on developing sustained-release drugs that can be targeted to a specific area of the body and designed to release therapeutic molecules over time. The goal is to reduce or eliminate the frequent reapplication of drugs, which in the case of eye diseases often involves multiple eyedrops or regular injections into the eye.

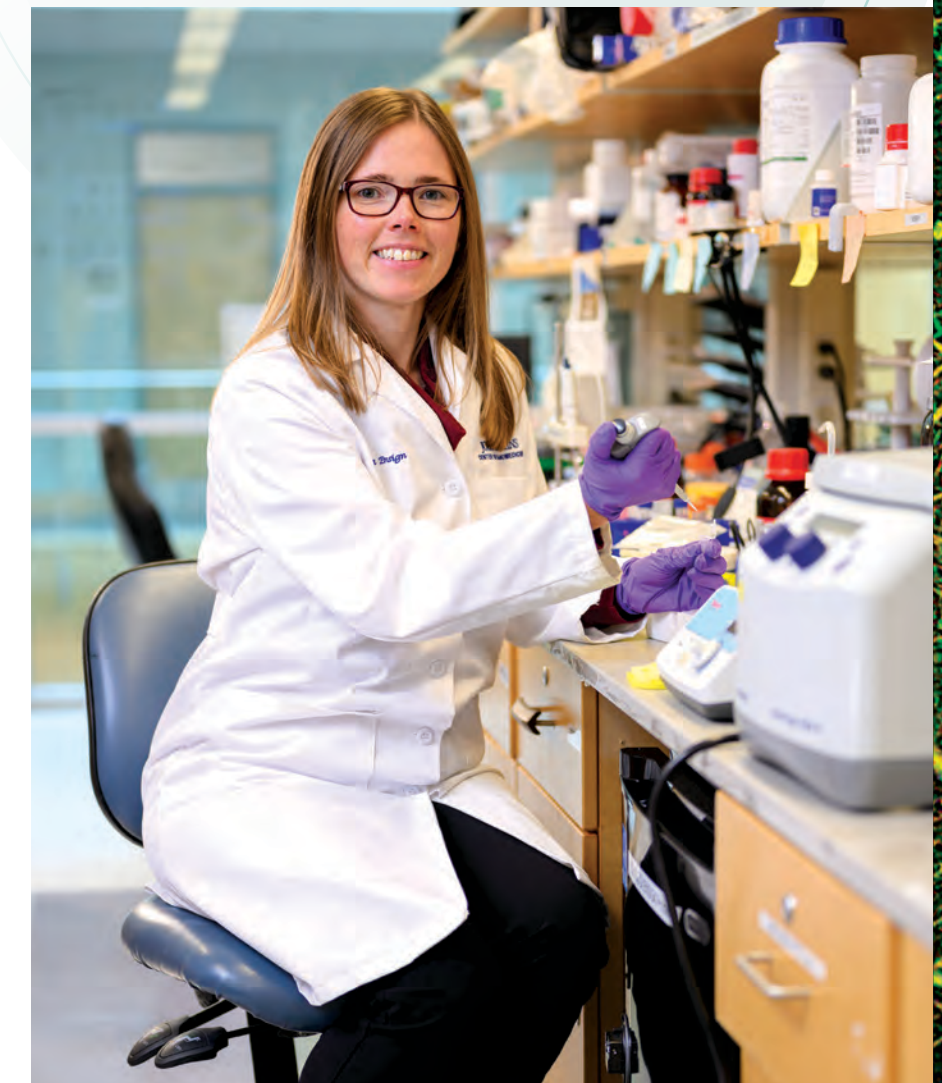
For this project involving AI, Ensign's team partnered with Michael Cummings, Ph.D., director of the Center for Bioinformatics and Computational Biology at the University of Maryland. They used a drug already known to reduce intraocular pressure (IOP), which can cause vision loss in glaucoma. Their aim: to combine the drug with other molecules that cause the drug to stay in the body longer and release more slowly.

The researchers decided to use a peptide — a sequence of amino acids — as the helper molecule. They constructed machine-learning algorithms to predict which peptide out of thousands would have the characteristics needed to penetrate into cells with the IOP-lowering drug in tow and bind to melanin (the compound that provides color to the eye and protects eye cells from UV exposure). When the AI model revealed the best peptide candidate, the researchers tested it in animal models and found that the

peptide and IOP-lowering drug did have a high concentration in melanin-containing cells — and that sustained therapeutic effect was achieved.

These represent just a sampling of dozens of projects underway at Wilmer that are harnessing the power of AI to improve clinical care in ophthalmology. "AI holds the promise of transforming much of ophthalmology, and Wilmer is at the forefront of it," says Liu. ●

Laura Ensign





IN AN INSTANT

By Amy Entwisle

Trauma often strikes quickly, with no warning, and with the ability to transform everyday activities into living nightmares.

With the only designated Level 1 eye trauma center in the region, Wilmer Eye Institute is singularly positioned to care for people who experience eye trauma both during the acute phase of their injury and, through Wilmer's numerous specialty clinics, for the duration of the follow-up care that is often needed. Here, we share the stories of two patients who received care at Wilmer for vision-threatening injuries.

Mack's Story

On July 5, 2022, 24-year-old Mackenzie ("Mack") Northrop, a heavy-duty diesel mechanic, was trying to dislodge a stuck metal sprocket on an excavator. He pounded it a couple of times with a hammer, but it wouldn't budge. He hit it again, and when he did so, a chunk of metal flew into his eye.

Northrop was stunned. When he closed his other eye, all he could see was blood. His boss rushed him to the nearby emergency room on Maryland's Eastern Shore.

At the hospital, doctors gave Northrop pain medication and planned to airlift him across the bay to the Wilmer Eye Trauma Center. When thunderstorms in the area made it too dangerous to fly, he traveled instead by ambulance to Wilmer with his wife, parents and boss following behind.

Through his injured eye, Northrop could see only light and shapes — hand

motion, but not fingers. A CT scan revealed that the 6-millimeter piece of metal had created an opening through the center of his eye — known as an open globe injury — destroying the lens and lodging in the retina, where it caused hemorrhage and a tear. The object rested adjacent to the optic nerve, which is responsible for transmitting visual information from the eye to the brain.

Northrop needed surgery urgently, but even with the surgery, the prognosis for vision in the eye was limited.

In the operating room, assistant chief of service **Narine Viruni, M.D.**, and retina fellow **Noam Rudnick, M.D., Ph.D.**, closed the ruptured globe, removed the damaged lens, retrieved the piece of metal and repaired the retina. If there was a chance of restoring his vision, Northrop would need a second surgery, to implant an artificial



Mackenzie ("Mack") Northrop, right, with son Brayden after Northrop's second surgery

Fasika Woreta and Michael Sulewski



lens to replace the one that had been destroyed. But first, he needed to heal.

Six months after the initial surgery, cornea specialist **Michael Sulewski, M.D.**, and Wilmer resident **Leangelo Hall, M.D.**, operated again, this time implanting an artificial lens. They also placed sutures in his pupil, which had been misshapen by the injury, to make it round once again. The following day, Northrop and his wife, Christine, returned to Wilmer where the bandages would be removed and they would learn whether he would be able to see out of the eye again.

“It was definitely a big improvement,” says Northrop, who attained 20/30 vision in the eye. “Everything is slightly blurry, a

little distorted, but if I went blind in my good eye, I’d still be able to live a high quality of life,” he says. The following week, he was able to return to work.

Northrop reflects on the accident that nearly cost him his eye. “I learned the hard way about wearing safety glasses. When I see people weed whacking on the side of the road with no safety glasses on, it makes me cringe,” he says.

He’s grateful to the doctors, nurses and staff at Wilmer who restored his sight. “I can’t thank those people enough who took care of me. Everybody was super knowledgeable, super nice, super understanding. It was definitely top-notch care,” he says.

THE WILMER EYE INSTITUTE’S EYE TRAUMA CENTER is the sole, designated facility in Maryland specializing in the diagnosis, treatment and long-term management of ocular trauma. At the center, Wilmer Eye Institute faculty, staff and trainees collaborate with Johns Hopkins Hospital adult and pediatric emergency departments and care teams to meet the comprehensive care needs of patients in Maryland, the District of Columbia and seven surrounding states.

Each year Wilmer is consulted to respond to around 2,000 emergency department patients with eye concerns, spanning all age groups, from neonatal, pediatric and adolescent to adult and geriatric. To learn more about the Eye Trauma Center at Wilmer Eye Institute use the QR code or visit: www.hopkinsmedicine.org/wilmer/services/trauma-center



Fasika Woreta, M.D., M.P.H., the Eugene de Juan, M.D. Professor of Ophthalmic Education, is director of the Wilmer Eye Trauma Center, as well as president of the board of directors of the American Society of Ophthalmic Trauma, a collective of ophthalmologist-leaders across the U.S. that is highly engaged in eye trauma education, policy-setting, academic collaboration and next-generation training. “I’m so proud of our incredible team of residents, fellows, faculty and nurses who work hard every day to care for patients with a wide range of traumatic eye injuries,” says Woreta.

John’s Story

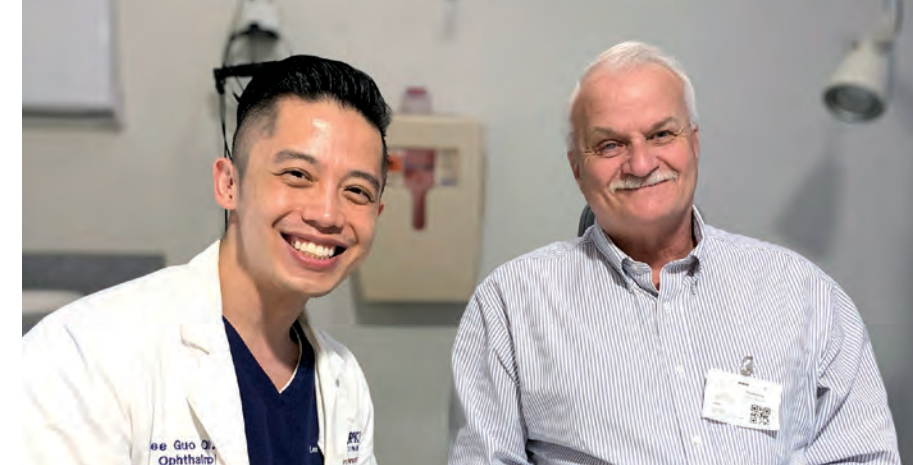
John Louderback was in his backyard doing something that millions of people do regularly: He was weed whacking, when a rock flew up and hit him in the eye.

A local ophthalmologist prescribed a steroid medication, but two days later, Louderback was in significant pain. The ophthalmologist referred him to a corneal specialist in nearby Frederick, who suspected an infection. He swabbed the eye and sent the swab off for analysis. “You’ve got to get to Wilmer,” he told Louderback.

At Wilmer’s Eye Trauma Center, Louderback was evaluated by on-call resident **Sidra Zafar, M.D.** Louderback had suffered a corneal abrasion when the rock hit his eye, but he also had a serious fungal infection, which led to the development of a vision-threatening ulcer.

“Fungus is everywhere, so if you get an abrasion, get some bad luck — especially some vegetative matter, something from the garden, going up and hitting your eye — you can get an infection,” says **Michael Sulewski, M.D.**, who led Louderback’s care team.

Over the next eight months, Louderback had some 40 follow-up visits at Wilmer where, in addition to Sulewski and Zafar, his care team included resident **Loka Thangamathesvaran, M.D.**, and trauma center director **Fasika Woreta, M.D., M.P.H.**, the Eugene de Juan, M.D. Professor of Ophthalmic Education. Louderback created a spreadsheet to record the length and width of the ulcer at each visit so he could see that he was in fact making progress — that the ulcer was closing.



Lee Guo and John Louderback

While fungal infections are notoriously challenging to eliminate, the team was able to eventually stop Louderback’s infection, and the ulcer healed. However, months of inflammation caused scarring over the pupil. It also caused a cataract to form. The question now was whether the damage to the eye was significant enough to require a corneal transplant, or whether the cornea could be salvaged.

Sulewski operated to remove the cataract and break up the scar around the pupil. Afterward, he referred Louderback to **Lee Guo, O.D.**, to be fitted with a specialized contact lens that would help smooth over any irregularities on the cornea’s surface. Ultimately, however, the large, irregularly shaped corneal scar impeded Louderback’s vision such that even the specialized lens couldn’t compensate, and he elected to have Sulewski perform a full cornea transplant.

Louderback can’t say enough about the people who cared for him at Wilmer, including Sulewski, whom he calls magnificent. “Dr. Sulewski explained everything so well. He really took the time,” Louderback says. He can’t get over the fact that Thangamathesvaran gave him her cellphone number. But Thangamathesvaran says, “Every patient I treat is like a family member. If it was my mom or dad, I would want that level of accessibility for them.” ●

The ophthalmologist referred him to a corneal specialist in nearby Frederick, who suspected an infection. He swabbed the eye and sent the swab off for analysis. “You’ve got to get to Wilmer,” he told Louderback.

Judith Goldstein and
Barbara Simerl in 2019



An Avid Gardener's Gift for Growth

When **Judith Goldstein, O.D.**, was first introduced to Barbara Simerl in 2015 by Simerl's dear friend of 50 years, Carol Melchner, Goldstein could not have imagined the friendship that lay in their future. That is to say, until they began to get to know each other.

By Joan Cramer

"She was a joy to be around," says Goldstein in describing her friend, a remarkable octogenarian who was witty, active, well-informed and enormously fun.

"Nothing fazed Barbara, even macular degeneration," recalls Melchner. "I think it was the secret to her good health and longevity."

Simerl was an avid gardener and passionate cook who sailed, fished, wove her own fabrics and served tea every day at 4 p.m. to any friend who happened to drop by. That's the kind of woman she was. That's why it came as such a jolt when Goldstein learned of the passing of her friend on June 26, 2022, at age 102.

Goldstein experienced a second shock when she later learned of the extraordinary and generous gift Simerl had bequeathed to support the ongoing work of the Wilmer Eye Institute's Lions Vision Research and Rehabilitation Center.

"Gifts like this to the Wilmer Institute have provided the seed funds to allow our scientists to pursue their best ideas and gather the preliminary data necessary to obtain grant funding from the National Institutes of Health and other agencies that support research," says Wilmer Director **Peter J. McDonnell, M.D.**, the William Holland Wilmer Professor of Ophthalmology.

The vision care that Goldstein provides at the Lions Vision Research and Rehabilitation Center is highly specialized care. As a physician and director of the center, Goldstein spends nearly an hour, face to face, with every patient as part of this unique, patient-centric rehabilitative program. In such a personalized setting, friendships are sometimes formed that go beyond the realm of clinical care and reveal the underlying humanity at work.

That was certainly the case with Barbara Simerl. Goldstein notes that Simerl's can-do attitude made her a natural fit for the low vision service, which relies in many ways on patients' willingness to adapt and learn. "Even at 100, she was determined to learn new skills," says Goldstein.

One of the low vision program's strengths, Goldstein notes, is its team approach to patient care. "Barbara would see me for an evaluation and then our occupational therapist, Kristen Shifflett, would dive into the practicalities. She might take the tools I was recommending and have Barbara simulate sewing or knitting or reading her beloved *New York Times*."

Goldstein says she is honored to have known Simerl and beyond grateful for a gift that she sees as an act of faith in the unlimited possibilities opening up for low vision patients, thanks to rapid advances in technology.

"Barbara's transformational gift will enable us to recruit young clinician-scientists and researchers dedicated to the field and to further the work of identifying and developing new treatment strategies to improve our patients' lives," says Goldstein. ●

HOW TO SUPPORT THE WILMER EYE INSTITUTE

Your donations directly impact the Wilmer Eye Institute's mission to transform medical outcomes in the field of ophthalmology through collaboration and innovation, resulting in compassionate, leading-edge, patient-informed care.

TYPES OF GIFTS

Cash Gifts: Gifts of all sizes made by check or credit card provide immediate support to the Institute. Gifts can be made outright or pledged over a period of up to five years.

Matching Gifts: Many employers offer a matching gift program. Complete the employee's section of the Matching Gift Form provided by your employer and mail the form to us. We will take care of all the other details and paperwork.

Memorial and Tribute Gifts: Memorial and tribute gifts are a wonderful way to commemorate family, friends or even a special physician. Any gift can be made in memory, or in honor, of an individual.

Stocks and Securities: Giving stock and other appreciated securities directly to the Wilmer Eye Institute offers an appealing mix of tax benefits and direct support for Wilmer. Appreciated securities are those that are worth more today than when you acquired them. Advantages include an immediate income tax deduction on the fair market value of your stock gift and avoidance of capital gains tax.

Gift Planning: Our Office of Gift Planning can provide you with resources to help fulfill your philanthropic wishes in coordination with your overall financial and estate planning. For more information, visit giving.jhu.edu/giftplanning.

United by a Patient-Centered Philosophy

By Jessica Wilson

Sharon Kress's hazel eyes glisten a little when she recalls her first visit to Wilmer. It was a stressful period in her life. She had recently been in a serious car accident, after which she was in a wheelchair for almost a year. Doctors thought she would not walk again.



By the time she arrived at Wilmer in 1998, she had proved that prediction wrong, but still had miles to go in her healing journey. She came to Wilmer in search of an oculoplastic surgeon to reconstruct her eye socket. For the next 20 years, oculoplastic surgeon **Nicholas Iliff, M.D.**, cared for her and performed nearly all of her many eye surgeries, until his retirement in 2016.

"He's an amazing man. I live in New Jersey and if I couldn't get an appointment, he met me at Bayview on Saturdays," she says, as just one example of how Iliff would go above and beyond for her. "When he retired, he said, I want to make sure I've left you with someone you can count on," says Kress. That person was **Shameema Sikder, M.D.**, a cornea specialist and the L. Douglas Lee and Barbara Levinson-Lee Professor of Ophthalmology.

Shameema Sikder and Sharon Kress

For several years, Kress saw Sikder for checkups and they established a warm rapport. Then, in 2019, Kress came to understand exactly why Iliff had recommended Sikder.

"It was Christmas Eve. My eyes started getting really infected. I was scared to death," Kress recalls. She called Sikder, who talked her through what she could do to ease the symptoms and then told Kress to call her back to report on her progress. "And Dr. Sikder said, 'If I don't call you back immediately, it's because I'm in Bangladesh,'" says Kress. "Right then I realized she's very much like Dr. Iliff. She'll drop anything to help somebody."

This was a lesson Sikder learned from Iliff directly. When Sikder was a resident, she rotated with Iliff, which meant spending many hours with him as he performed surgeries and examined patients in the clinic. "He was just so empathetic. He told me, 'Shameema, when someone calls you at two in the morning, that means they've been staring at their ceiling for four hours wondering, why is this happening?'"

His perspective profoundly shaped Sikder's patient care approach — and has led to a meaningful bond with Kress. "We are united by this admiration for Dr. Iliff," says Sikder. Kress agrees, of course. But she believes the compassionate, skillful care she received from Iliff is not limited to him. "The people who are here are just amazing people — they're kind and giving and want to help," says Kress. ●



Shameema Sikder, Nicholas Iliff and Sharon Kress in 2023

"The people who are here are just amazing people — they're kind and giving and want to help."

— SHARON KRESS



Amanda Henderson,
Colin Kane,
Kelly Seidler

Expanding Accessibility in Neuro-Ophthalmology Care

By Joan Cramer

Trained to tease out the often subtle connections between vision anomalies and a wide range of nervous system disorders, the ultra-specialized Wilmer neuro-ophthalmology team is in high demand.

A worldwide shortage of neuro-ophthalmologists has made it increasingly difficult to meet that demand, but the division has risen to the challenge — by pioneering the deployment of specially trained optometrists to ensure that every patient who needs it can be evaluated immediately.

“The shortage of neuro-ophthalmologists is currently at the forefront of discussions in ophthalmology departments, publications and national meetings across the country,” says **Amanda Henderson, M.D.**, chief of Wilmer’s small but storied neuro-ophthalmology division and associate professor of ophthalmology and neurology. “I’ve been invited to present our approach, using optometrists as ‘neuro-ophthalmologist extenders’ — which we initiated about 10 years ago — at the North American Neuro-Ophthalmology Society’s annual meeting in March 2024.”

There are currently two optometrists on Henderson’s team. They do triage in urgent cases and see long-term patients for routine follow-up exams. **Colin Kane, O.D.**, assistant professor of ophthalmology, and **Kelly Seidler, O.D.**, clinic director of Wilmer’s Frederick, Maryland, office and instructor of ophthalmology, are both members of what is still a small, but elite new cohort of optometrists with special training in medical and neurologic eye disease.

“A lot of what I do is rule things out,” says Kane. “A doctor might be worried about a patient with double vision or a suspicious-looking optic nerve and refer them to us and I can usually schedule them for a preliminary workup right away.” And because Kane works closely with Henderson and ophthalmologist **Michael Carper, M.D.**, assistant professor of ophthalmology and neurology, “they are always ready to step in,” Kane says, “if I see anything atypical that needs immediate attention.”

Seidler plays a key role in staffing Wilmer’s Frederick office, under the supervision and mentorship of neuro-ophthalmologist **Andrew Carey, M.D.**, assistant professor of ophthalmology and neurology. Carey and Carper join her in seeing patients there twice a month, and Seidler says patients benefit from the division’s robust teamwork. “I am in constant close touch with the neuro-ophthalmology team and other Wilmer specialists,” she says. “We have such a depth of expertise available, and if I need to consult or need help ordering tests and imaging, they are always immediately there for me.” ●

PATIENTS DRIVE TREATMENT BREAKTHROUGHS

Finding better treatment for their patients is almost an obsession for physician-scientists like **Amanda Henderson, M.D.**, and her neuro-ophthalmology team.

But patients are not only the inspiration for the translational and clinical research that produces new treatments. They are very often the donors whose gifts make that research possible.

“This is a fast-moving field and there are a lot of conditions we have many good treatments for that we didn’t have 20 years ago,” Henderson says. “Grateful patients are helping to make that happen, and there is no gift too small to have a big impact.”

ALL IN THE WILMER FAMILY



Colin Kane and James Kane

“I practically grew up at Wilmer,” says **Colin Kane, O.D.**, now an assistant professor of ophthalmology at the institute where his father, James Kane, worked as an equipment technician for 41 years.

David Guyton, M.D., now the Zanyl Krieger Professor of Pediatric Ophthalmology, performed Colin Kane’s strabismus surgery when he was three. And, post-college, Colin’s dad encouraged him to train as an ophthalmic technician and to join the Wilmer team, which he did.

Colin says he loved the job, but an almost unquenchable curiosity and a desire to better equip himself to help patients inspired him to leave to pursue a doctorate in optometry with special training in ocular disease.

“I have always been fascinated by the connection between the eyes and the brain and I feel so lucky to not only be back at Wilmer, which feels like home to me, but working in the division I so much wanted to be in,” he says.

2023 EVENTS



BOARD OF GOVERNORS MEETING MAY 10

Wilmer Director **Peter J. McDonnell, M.D.**, paid tribute to longtime Wilmer Board of Governors member **Rick Forsythe**, who died in December 2022. Special guests Francine Siegal, M.D., and William Zieverink, M.D., graduates of the Johns Hopkins University School of Medicine and passionate public health advocates, shared their stories of inspiration and their plan to endow The Francine Siegal and William Zieverink Fund for Vision Science.

▲ The Wilmer Board of Governors met at the Robert H. and Clarice Smith Building for an update on the Institute.



◀ Left to right: Theodore L. DeWeese, interim dean of the medical faculty and CEO, Johns Hopkins Medicine; Wilmer Director Peter J. McDonnell; Nakul Shekhawat; Mariellen Brickley-Raab; Stephen F Raab; Johns Hopkins University President Ronald J. Daniels

DEDICATION OF THE STEPHEN F RAAB AND MARIELLEN BRICKLEY-RAAB RISING PROFESSORSHIP IN OPHTHALMOLOGY MAY 10

Nakul Shekhawat, M.D., M.P.H., became the inaugural recipient of the Stephen F Raab and Mariellen Brickley-Raab Rising Professorship in Ophthalmology. A dedication ceremony and reception were held in the atrium of the Robert H. and Clarice Smith Building. Speakers and dignitaries included Wilmer Director **Peter J. McDonnell, M.D.**; Johns Hopkins University President **Ronald J. Daniels, J.D., LL.M.**; **Theodore L. DeWeese, M.D.**, interim dean of the medical faculty and CEO, Johns Hopkins Medicine; and **Stephen F Raab** and **Mariellen Brickley-Raab**.



▲ Megan Collins and Christine Levy

COLLINS PRESENTS AT HOPKINS ON THE HILL EVENT JUNE 7

Megan Collins, M.D., M.P.H., presented her Vision for Baltimore research at the 2023 Hopkins on the Hill Event in Washington, D.C. Collins's team was one of 12 showcasing their work in health care, AI, extreme materials, space exploration and more.

THE 81ST WILMER RESIDENTS ASSOCIATION MEETING JUNE 16

The Wilmer Residents Association (WRA) held its 81st annual Clinical Research Meeting and graduation dinner. During the meeting, residents vying for the revered Mitchell Prize presented their research papers. **Jean Bennett, M.D., Ph.D.**, and **Albert Maguire, M.D. '90**, developers of the first FDA-approved gene therapy drug, delivered the Wilmer Memorial Lecture.



◀ Loka Thangamathesvaran, center, was the recipient of the 2023 Morton and Myrna Goldberg [pictured left] Prize for Exemplary Citizenship in Intradepartmental Affairs and for Superlative Care of Wilmer Patients.



BEHRENS BECOMES U.S. CITIZEN AUGUST 29

Ashley Behrens, M.D., chief of the Division of Comprehensive Ophthalmology at Wilmer, became a U.S. citizen. Many from the Edward St. John Foundation and St. John Properties are supporters and advocates of Behrens and were excited to celebrate the happy occasion with him.

◀ Left to right: Larry Maykrantz, president and CEO, St. John Properties; Edward St. John, founder and chairman, St. John Properties; Ashley Behrens; Sharon Akers, executive director, Special Projects, St. John Properties, and president, Edward St. John Foundation; Mindy Saler, assistant vice president, Legal, St. John Properties; Debbie Friedman, executive assistant to Edward St. John; Michelle Van Newkirk, assistant vice president, Contracts, St. John Properties; and Lori Rice, executive vice president and CFO, St. John Properties

2023 EVENTS



CURING COATS FUNDRAISER SEPTEMBER 30

The Ninth Annual Curing Coats Fundraiser was held at Hysteria Brewing Co. and Lost Ark Distilling Co. The event was hosted by the Smole family, whose son Sean was diagnosed with Coats disease in 2013. The money raised through the annual fundraiser is making a difference: **Akrit Sodhi, M.D., Ph.D.**, and his team have been hard at work identifying proteins in the eye that may represent a treatment target for the disease.

◀ Left to right: Akrit Sodhi, Jack Pavlovcak and Sean Smole. Jack, who is Sean's best friend, has raised funds each year for Coats research through a basketball tournament called "Shots for Coats."

▶ Left to right: Brad Andrukitis, Eminent Grand Generalissimo, Knights Templar Eye Foundation; Lingli Zhou; Muhammad Ali Riaz; John Austin, Right Eminent Grand Commander, Maryland Knights Templar; Gary Kennedy, Eminent Grand Captain General, Knights Templar Eye Foundation; and Wilmer Director Peter J. McDonnell



KNIGHTS TEMPLAR EYE FOUNDATION PRESENTATION OF GRANTS OCTOBER 2

Representatives from the Knights Templar Eye Foundation (KTEF) awarded a 2023–2024 KTEF Career Starter Grant to postdoctoral fellow **Muhammad Ali Riaz, Ph.D.** In addition, KTEF awarded a 2023–2024 Competitive Renewal Grant to **Lingli Zhou, M.D.**



▲ Left to right: Gary Ratner, Jean Finkelstein Ratner, James Finkelstein, Josh Finkelstein, Carla Finkelstein, Jefferson Doyle, Andreas C. Dracopoulos and Wilmer Director Peter J. McDonnell

DEDICATION AND INSTALLATION OF THE ANDREAS C. DRACOPOULOS AND DANIEL FINKELSTEIN, M.D. RISING PROFESSORSHIP IN OPHTHALMOLOGY AND THE REINSTALLATION OF THE ANDREAS C. DRACOPOULOS PROFESSORSHIP IN OPHTHALMOLOGY OCTOBER 2

Jefferson Doyle, M.D., Ph.D., M.H.S., was celebrated as the inaugural recipient of the Andreas C. Dracopoulos and Daniel Finkelstein, M.D. Rising Professorship in Ophthalmology. In addition, **Mandeep Singh, M.D., Ph.D.**, was reinstated as the recipient of the Andreas C. Dracopoulos Professorship in Ophthalmology. The inaugural recipient of the Dracopoulos Professorship was the late **Daniel Finkelstein, M.D.** A ceremony and reception were held at the Robert H. and Clarice Smith Building. Speakers and dignitaries included Wilmer Director **Peter J. McDonnell, M.D.**; **Landon King, M.D.**, executive vice dean for the Johns Hopkins University School of Medicine; Andreas C. Dracopoulos; and Carla Finkelstein, Ph.D.



▶ Mandeep Singh and Wilmer Director Peter J. McDonnell



WILMER RECEPTION AT THE AMERICAN ACADEMY OF OPHTHALMOLOGY ANNUAL MEETING NOVEMBER 4

Wilmer alumni and faculty members gathered at La Mar on San Francisco's Embarcadero for a reception hosted by the Wilmer Residents Association. Guests had the opportunity to mix, mingle and catch up with longtime friends and colleagues.



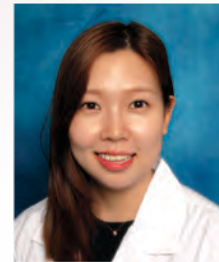
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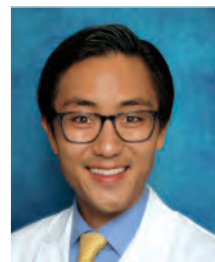
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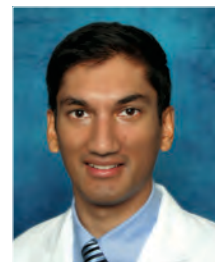
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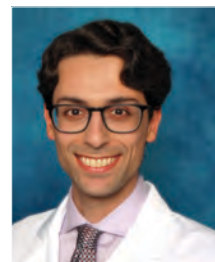
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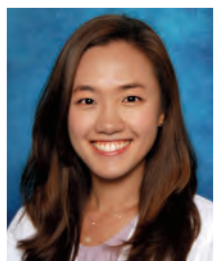
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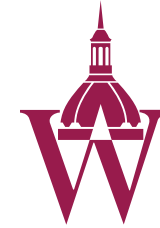
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