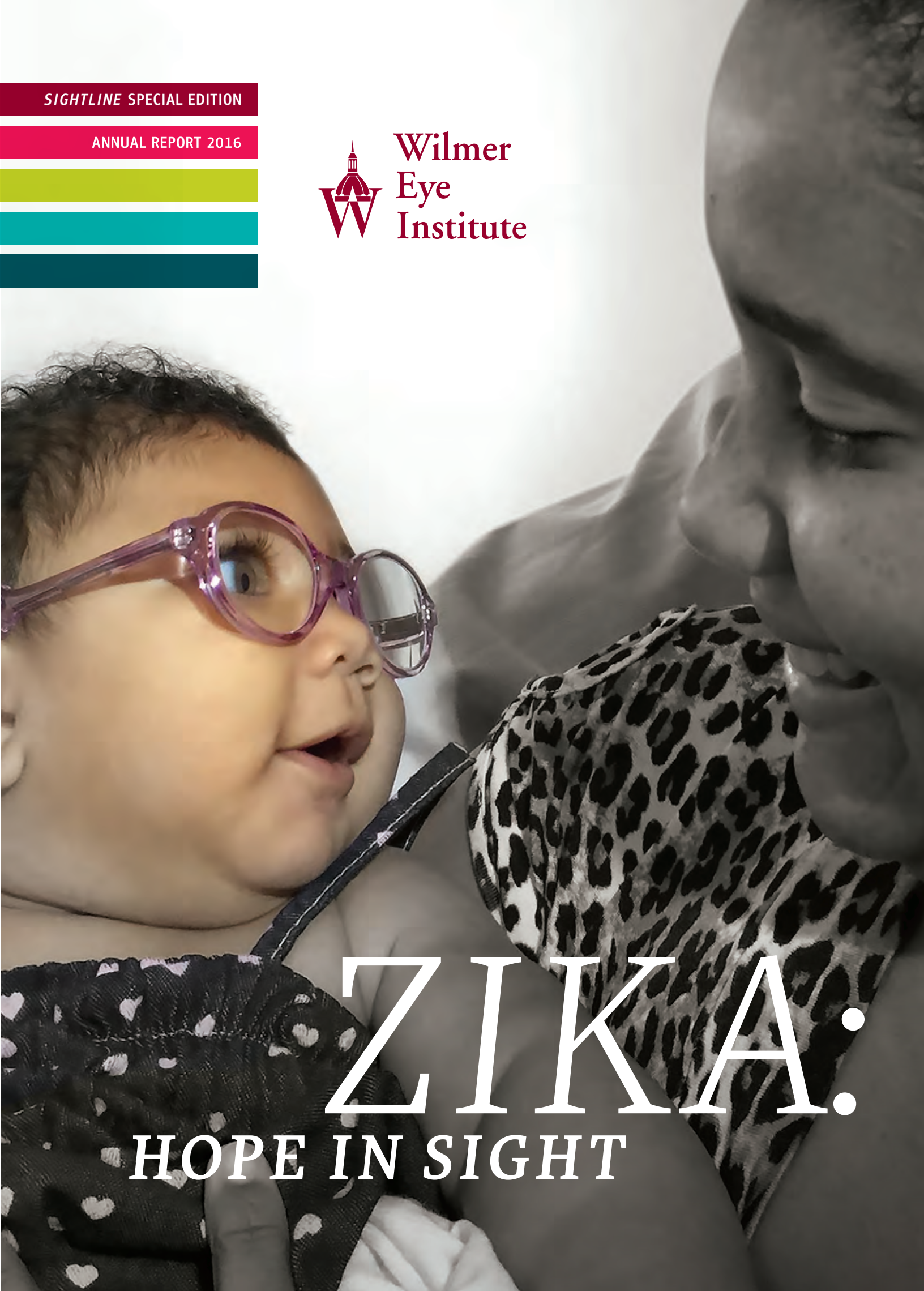


SIGHTLINE SPECIAL EDITION

ANNUAL REPORT 2016



Wilmer
Eye
Institute



ZIKA:

HOPE IN SIGHT



† William May, M.D., examines a patient for possible Zika-related symptoms.

It is literally the case that, as I compose this letter to you, a patient with a disease caused by Zika virus infection is being examined on the third floor of the Wilmer Eye Institute. Like the vast majority of people in the world with confirmed Zika-related illness, this individual is an adult. The problems she's experiencing are not limited to her eyes, and physicians in other departments here at Johns Hopkins will be involved in her care.

Some time ago, experts predicted that Zika virus would come to the United States. As a result, Wilmer moved to create a center that would be prepared to diagnose and treat affected patients while also conducting research to develop new therapies and hopefully eradicate this problem.

A team from Wilmer, led by William May, M.D., traveled to Brazil to examine a large number of affected patients and learn all we could about what medical professionals in that country had done to help these patients and help reduce the number of individuals with the infection. Then, we quickly assembled a team of about a dozen Wilmer faculty members and—as of today—about three dozen faculty members from other departments in our medical school and from other Johns Hopkins divisions.

While hoping for the best—that the infection would not reach our shores—we were determined to be fully prepared in case it did. Our experience in late summer/early fall showed that we were wise to invest the time and energy in creating the Johns Hopkins Zika Center. Zika is now here, and we have multi-specialty teams of physicians ready to care for Zika patients, whether newborns or adults.

In this issue of *SightLine*, you will read about this and other examples of Wilmer's involvement internationally. As with Zika and Ebola virus disease before it, some problems that affect the eyes do not respect national borders, and Wilmer faculty members are heavily engaged in research activities around the globe, including in China, India and Africa.

We strive to help our colleagues in other nations and also to learn from them. In this issue, you will read about the efforts of Albert Jun, M.D., Ph.D., chief of our Cornea Service, to make sure our young faculty members are staying fully abreast of what new developments and ideas are being generated outside the United States. American ophthalmology has no monopoly on innovation, and we intend for Wilmer to quickly incorporate the best ideas, no matter where they originate.

On a personal note, it's been 40 years since I entered medical school. Like other physicians who have spent their careers in major urban medical



centers, I have seen many people with serious—and sometimes dramatic—illnesses coming to seek relief for their suffering. But recently, my experience of meeting 40 young Brazilian mothers holding their babies, most of whom had severe and obvious deformities and (not so obvious) major eye problems caused by Zika virus during pregnancy, was almost overwhelming.

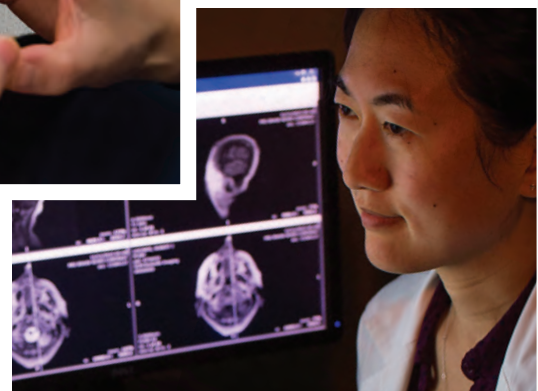
That same day, a Brazilian physician told me that when a severe disease comes to a country like his, he finds himself hoping that it will also spread to the U.S. If it does, he explained, the might of American biomedical science will be focused on the disease, and a cure will be speedily found.

With regard to Zika, I hope his prediction of a prompt and successful response will come true. I can assure you that Wilmer and Johns Hopkins faculty members are doing all they can to rise to this challenge.

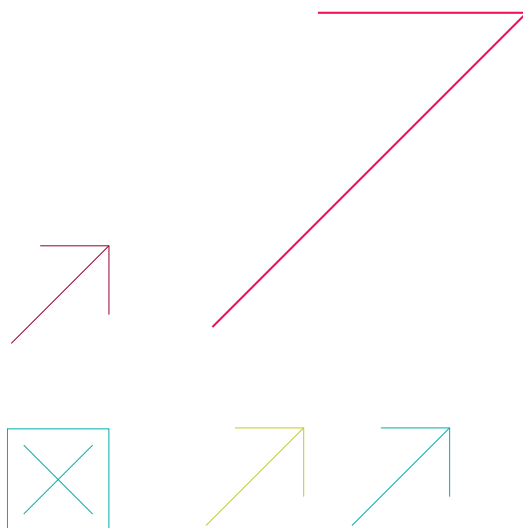
Sincerely,

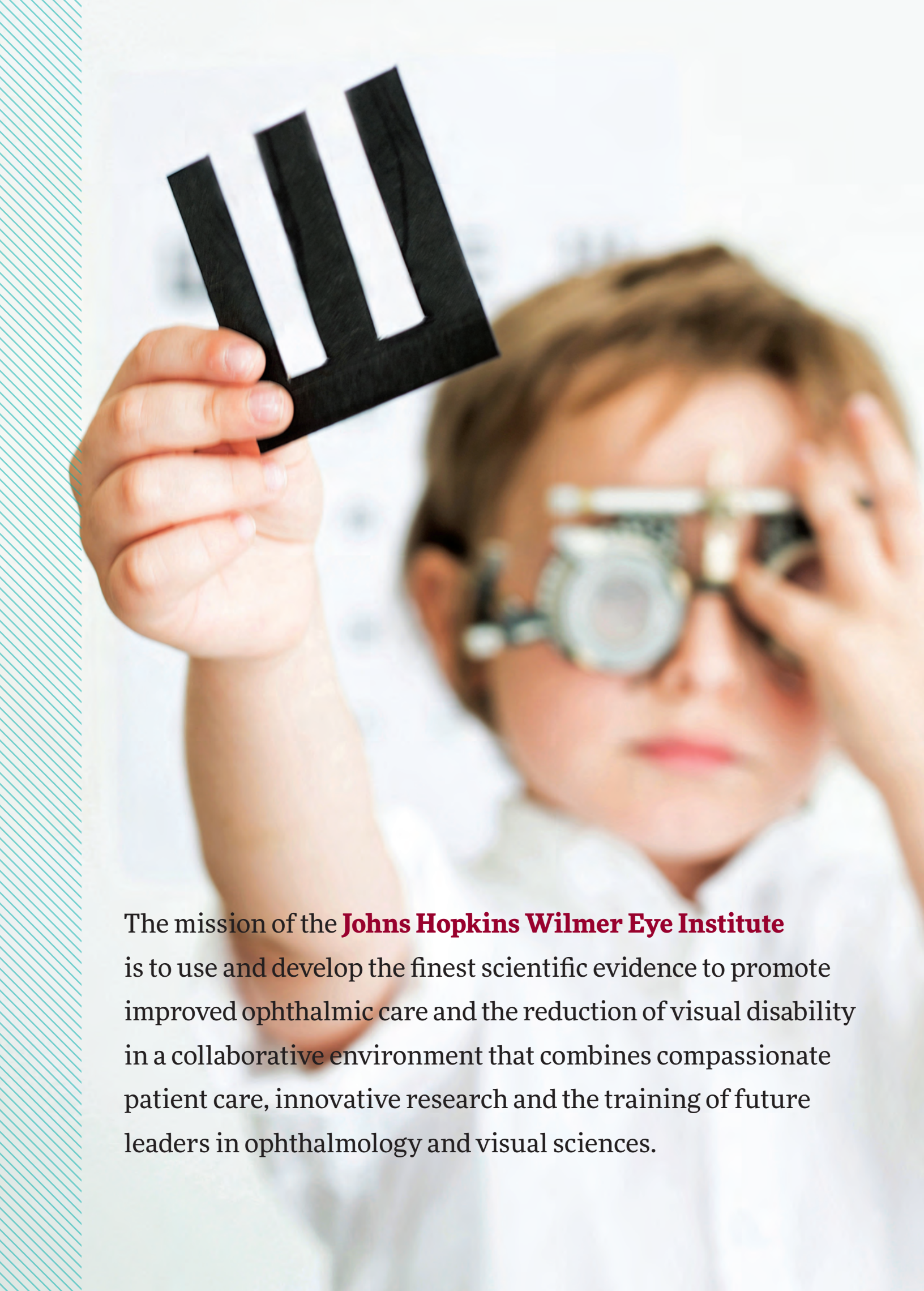
PETER J. McDONNELL, *Director*

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The mission of the **Johns Hopkins Wilmer Eye Institute** is to use and develop the finest scientific evidence to promote improved ophthalmic care and the reduction of visual disability in a collaborative environment that combines compassionate patient care, innovative research and the training of future leaders in ophthalmology and visual sciences.

Johns Hopkins Wilmer Zika Center

A system wide approach to a new disease threat



JOHNS HOPKINS
MEDICINE

ALL EYES ON ZIKA

A NEW CENTER OFFERS THE MOST
UNIQUE AND COMPREHENSIVE CARE
AVAILABLE IN ONE INSTITUTION.

→ William May, M.D.,
is co-director of the new center.





“THE RAPID INCREASE IN THE NUMBER OF OUR CITIZENS, IN MARYLAND AND OTHER STATES, WHO HAVE CONTRACTED ZIKA VIRUS MAKES IT PRUDENT THAT WE AT JOHNS HOPKINS MAKE EVERY EFFORT TO PREPARE TO ADDRESS THE NEEDS OF OUR POPULATION.” **WILLIAM MAY, M.D.**

With the sting of Ebola virus disease still fresh, a core group of doctors from the Wilmer Eye Institute established the Johns Hopkins Zika Center to respond to the growing threat of the virus.

“We are working to contain the disease, hoping that it won’t reach pandemic levels, but we are also working to treat those who already have contracted the virus,” says the center’s co-leader, William May, M.D., an ophthalmologist at Wilmer.

In addition to leadership from Wilmer, the multidisciplinary team includes world experts and staff members from across Johns Hopkins Medicine and the Johns Hopkins Bloomberg School of Public Health, from fields including epidemiology, infectious diseases, maternal-fetal medicine, orthopaedics, pediatrics, physiotherapy, psychiatry and social work. Medical experts from Brazil, a country greatly affected by Zika, are also members of the center, including Carol Marquezan, M.D., who has come to Baltimore to work closely with May to assess the needs that may arise should substantial numbers of patients develop Zika infection in our region of the world.

The early spread of Zika in the Western Hemisphere was once largely confined to Latin America, but the number of reported cases in the United States is now rapidly growing. The swath of the country expected to experience Zika stretches from coast to coast and as far north as Minnesota and New England. As of August, in the U.S. alone, the rate of reported Zika cases had tripled in two months, with more than 2,700 cases on record—including 624 documented cases in pregnant women and 21 babies born with birth defects (five pregnancy losses among them).

Images of infants with Zika-induced microcephaly have blanketed the media, stirring concern and compassion. While Zika is perhaps best known for its profound risks for pregnant women and the brain development of their fetuses, the consequences of Zika go far beyond that, May says. As many as 55 percent of Zika-infected babies may have eye disease, and ocular abnormalities have been reported in a baby with Zika who had no indication of microcephaly. Also, adults may develop eye disease after becoming infected with the virus.



† Left to right, Rubens Belfort Jr., M.D., Ph.D., M.B.A.; Adriana Lima, M.D.; William May, M.D.; and Wilmer Director Peter J. McDonnell, M.D., in Recife, Brazil, a community hit particularly hard by the Zika virus.

“Without a doubt, microcephaly is a gruesome and real consequence, but Zika is not a one-specialty concern,” May says. “The list of adverse outcomes from Zika ranges from severe brain damage to profound hearing and vision loss. That’s where Wilmer comes in.”

With the new center in operation, Zika patients can find the most unique and comprehensive care available in one institution from acknowledged leaders in their fields. One such physician is Allen Eghrari, M.D., also an ophthalmologist at Wilmer, who gained recognition with his efforts to respond to Ebola in West Africa in the summer and fall of 2015.

Eghrari says that if and when as-yet-undeveloped vaccination efforts begin to bring the Zika epidemic under control, the center will continue to treat the people who have Zika over the long term and do whatever it can to ensure their ongoing health.

“The Zika virus can go in the eye and stay in the body for months after infection. This raises concern that patients will need ongoing care, even when the disease is seemingly cleared,” Eghrari explains. “The understanding that we gained in West Africa can provide us a target for therapy and guidance with regard to how to treat Zika more aggressively.”

Wilmer’s policy is to see every patient who seeks care. “We will not turn anyone away,” May says. ▲



† Allen Eghrari, M.D., and Carol Marquezan, M.D.

ALL HANDS ON DECK

As with any effort that has international reach, the costs are profound to establish a medical center, secure real estate, equip the center with cutting-edge technologies, pay faculty and staff members, and initiate critical research regimens.

Individual giving will be critical to the success of the Johns Hopkins Zika Center, says the center’s co-leader, William May, M.D. “This is the time when we need public health-minded donors to step forward in any degree they can to help us combat this devastating disease,” he says.

It will also take partnerships with industry, other medical institutions and the nongovernmental organization community, says Ebola-hardened ophthalmologist Allen Eghrari, M.D.: “One thing we learned with Ebola was that partnerships were invaluable. Organizations from across the world came together to tackle problems, and we made great progress.”

“Let’s not let an epidemic become a pandemic,” May concludes. “We must act fast to get on top of Zika before it’s too late.”

“To put glasses on a kid’s face and have them smile and say, ‘Wow, I can now see’—it’s just so incredibly humbling and gratifying.”

—MEGAN COLLINS, M.D.



← Megan Collins, M.D., adjusts the glasses of a student participating in BREDS.

SEEING THE FUTURE

NEW PARTNERSHIP PROVIDES EYE SCREENING, AND GLASSES, TO BALTIMORE CITY PUBLIC SCHOOLCHILDREN FROM PRE-KINDERGARTEN THROUGH EIGHTH GRADE.

As a third-grade teacher at Baltimore’s Windsor Hills Elementary School, Kim Alexander has seen the impact of poor eyesight firsthand: One student’s vision was so bad that he had to stand within inches of the chalkboard just to read her writing. Others were assigned to the front row, unable to focus because they couldn’t read the board a few feet away or the books she put before them.

“These kids want to be able to see. They want to be able to participate, but they are looking at a fuzzy world,” Alexander says.

Eventually, Alexander grew so frustrated that she took it upon herself to cart her entire class of 30 students to a local retailer for discount exams and glasses. But often, the glasses would be broken or lost within days.

Those stories seem to belong to another lifetime now. Two years ago, her students became involved in the Baltimore Reading and Eye Disease Study (BREDS)—“bee reds.”

BREDS is an innovative joint effort between the Wilmer Eye Institute and the Johns Hopkins University School of Education. The program began a few years back, when David Friedman, M.D., M.P.H., Ph.D., an ophthalmologist at Wilmer, and Robert Slavin, Ph.D., at the school of education, came up with the notion that glasses might actually solve reading problems in kids who are struggling academically. They next enlisted Michael Repka, M.D., and Megan Collins, M.D., both pediatric ophthalmologists at Wilmer.



† The BREDS faculty includes, left to right, the Wilmer Eye Institute's Michael Repka, M.D.; David Friedman, M.D., M.P.H., Ph.D.; Megan Collins, M.D.; and the Johns Hopkins University School of Education's Robert Slavin, Ph.D.

Each of the past two autumns, BREDS staff members have gone to participating schools to perform eye exams, test student reading abilities and outfit kids with new glasses. Throughout the year, they have remained on call to make sure the kids are wearing their glasses, replace broken and lost frames, and track academic performance.

Collins, who leads the program, did the legwork, visiting schools and providing eye tests for BREDS. She estimates she conducted over 500 exams in BREDS' first two years. The kids now know her face. "You're the eye doctor!" they shout, rushing up to give her hugs.

"To put glasses on a kid's face and have them smile and say, 'Wow, I can now see'—it's just so incredibly humbling and gratifying," she says.

Some 320 second- and third-grade students at 12 Baltimore schools participated in BREDS.

The most common eye problem was uncorrected refractive error: nearsightedness, farsightedness and astigmatism. Those were followed by convergence insufficiency—difficulty focusing the eyes together for close-up activity.

Glasses were prescribed to 61 percent of students in BREDS. This is higher than would be prescribed by traditional guidelines, which would have recommended outfitting just 21.5 percent of students with glasses. The marked difference in

this study resulted from the BREDS team wanting to understand the impact of providing glasses on reading performance. Glasses were shown to have a positive impact on reading scores, suggesting that students who need glasses must have them in a timely manner, early in their education.

"We're very pleased with how BREDS has performed, and we're excited to see where things go as we roll it out on a wider basis," Repka says.

The data from and lessons learned in BREDS have informed the work of Vision for Baltimore. This new citywide collaboration between the Baltimore City Health Department, Baltimore City Public Schools, The Johns Hopkins University, Vision to Learn and eyeglass maker Warby Parker will expand vision screening services to all pre-kindergarten through eighth-grade students in Baltimore City Public Schools.

In addition, Warby Parker has committed to providing two pairs of glasses to as many as 2,750 pre-kindergarten to eighth-grade students during the 2016–2017 school year. Vision for Baltimore will provide these services and glasses to all students who need them, regardless of ability to pay. Beloved Baltimore Ravens linebacker Ray Lewis has even gotten involved. He handed out glasses at the Vision for Baltimore launch this past spring.



† Megan Collins, M.D., looking cool with some of the BREDS participants.

“At Warby Parker, we believe glasses have an immediate and positive impact on a person’s life. When you can see, you can learn and succeed, and we are proud to be working with a partner that shares in this belief,” says Jesse Schultz, social innovation manager for Warby Parker.

Collins and Slavin are co-principal investigators on the research arm of Vision for Baltimore, which is studying the impact of glasses on academic performance and strategies to promote student use of their eyeglasses.

Collins says BREDS’ unique model has removed a huge burden from already overtaxed parents. BREDS keeps everything involved with eye testing and glasses within the school community—testing, fitting, dispensing and follow-up all happen on school time. Kids who need glasses choose their own frames right there. When the glasses are ready, they are brought to them at school.

“Traditionally, kids who fail eye exams were handed a form saying, ‘Go visit an eye doctor and get your glasses on your own, outside of school,’” Collins says. “BREDS is turning that model on its head.”

In her time running BREDS, Collins has also witnessed one more phenomenon that caught her off guard: Glasses, it seems, are suddenly fashionable.

“When I wore glasses as a kid, I was teased incessantly, but it’s sort of cool now to wear glasses,” Collins recalls. “That makes my job a lot easier. It’s just a lot of fun.” ▲

DEBT RELIEF

Six digits of debt. That’s what graduating medical students often face. In fact, the average medical school student graduated with a median debt of \$183,000 in 2015, according to the Association of American Medical Colleges.

“If you’ve been going to medical school and maybe you’re married and you’ve got a family, it’s pretty tough to pay off that debt,” says Rick Forsythe, former co-chair of Wilmer’s Board of Governors. “It’s a big incentive if somebody else comes in and says, ‘We’ll take the debt off your hands.’”

Forsythe believed Wilmer needed to be that somebody, so in 2012, he and his wife, Sandy, provided the seed money to launch the Next Generation Fund. It’s goal: to give Wilmer Director Peter J. McDonnell, M.D., “some ammunition” for trying to attract and retain the highest caliber doctors as junior faculty members and fellows. The beneficiaries chosen each year receive funds to pay down their student loans.

“We can build all the buildings you want; unless there are great doctors in them, they’re no good,” says Forsythe. “And we want the pick of the litter.”

Pediatric ophthalmologist Megan Collins, M.D., is the 2016 beneficiary of the Next Generation Fund. Says Collins: “Being chosen as a recipient has provided me the opportunity to pursue exciting research opportunities in vision and public health. I am grateful for the generosity of the Forsythe family and the support of Dr. McDonnell. It truly is an honor.”



TARGETING THE NEUROLOGY OF VISION

WILMER HAS ASSEMBLED THE LARGEST, MOST
COMPREHENSIVE TEAM OF NEURO-OPHTHALMOLOGISTS
IN THE COUNTRY—PERHAPS THE WORLD.

There are no small symptoms in neuro-ophthalmology. Just ask Timothy McCulley, M.D., chief of the Division of Neuro-Ophthalmology at the Wilmer Eye Institute. In that role, he sees plenty of severe, nerve-related vision problems, including total blindness.

He also sees some seemingly minor conditions, but McCulley is never sanguine. In neuro-ophthalmology, even the most minor of symptoms can indicate

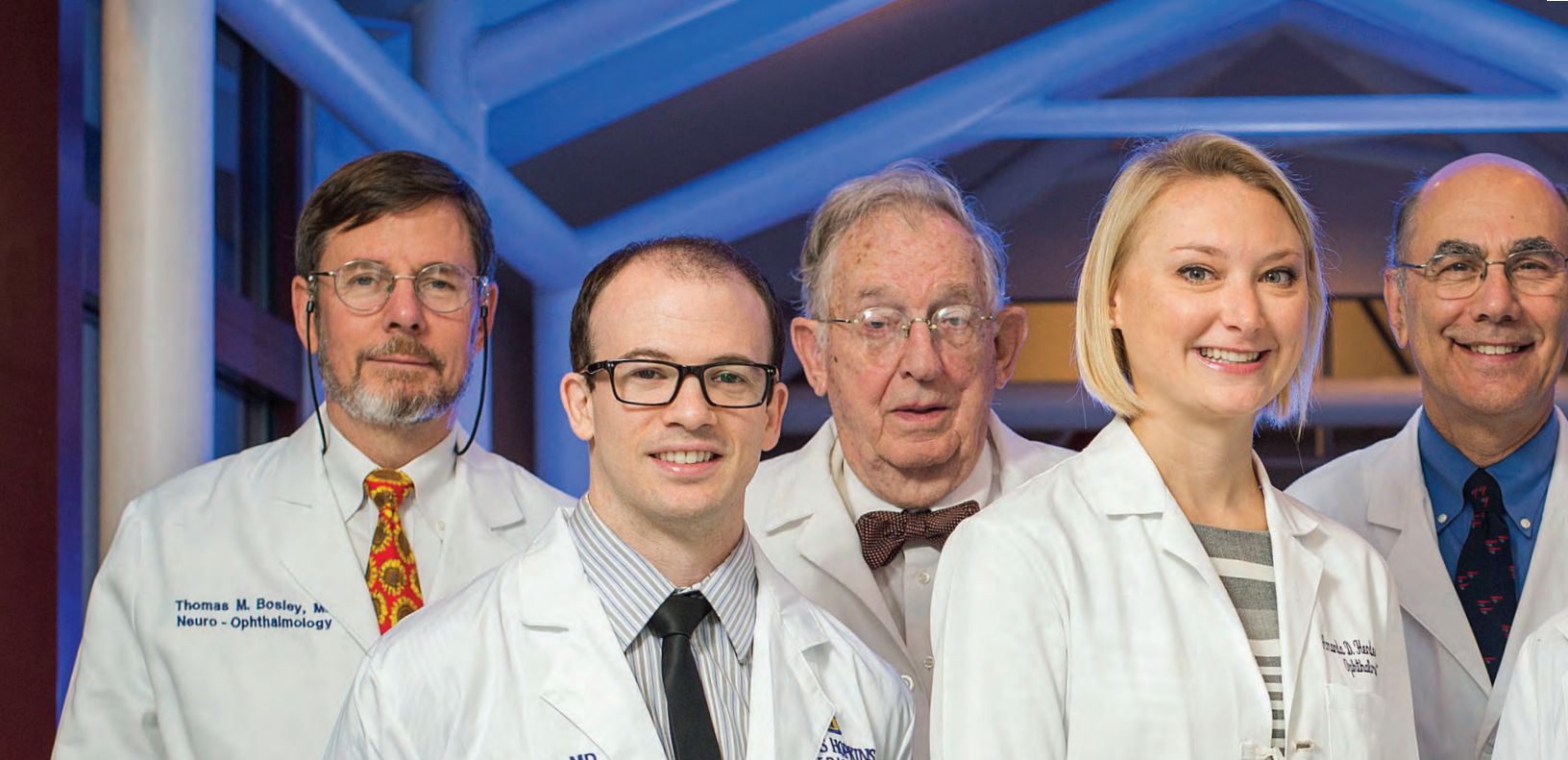
far more serious, perhaps life-threatening, conditions.

“Some patients may come with a droopy eyelid or mild double vision, and we treat them all with the same concern.

An otherwise minor symptom could be an early warning sign of something serious—a growing-but-not-yet-ruptured aneurysm, a stroke, multiple sclerosis or even a brain tumor,” McCulley says.

→ Top, Amanda Henderson, M.D., and Clarissa Kum, O.D., consult in an exam room of Wilmer’s Division of Neuro-Ophthalmology.





† The neuro-ophthalmology faculty, left to right, Thomas Bosley, M.D.; Andrew Carey, M.D.; David Knox, M.D.; Amanda Henderson, M.D.; Neil Miller, M.D.; Clarissa Kum, O.D.; and Timothy McCulley, M.D.

Neuro-ophthalmology is not the largest division at Wilmer—it has numbered just two or three doctors at times—but as these examples show, the field’s impact on patient health is as profound as any in the entire institute.

Recently, the Wilmer neuro-ophthalmology group, among the longest-existing such groups in the world, has grown, fueled by advances in our understanding of neurology and genetics, and in the technologies and techniques for treating neuro-ophthalmology’s serious conditions.

The division has recently added three new faculty members. Not least among them is Thomas “Mac” Bosley, M.D., a noted neurologist who recently became the Knights Templar Eye Foundation Professor of Ophthalmology at Wilmer.

The Knights Templar has been a stalwart benefactor to Wilmer along many philanthropic avenues. In this circumstance, its generosity allowed the Division of Neuro-Ophthalmology to recruit Bosley from the other side of the globe as a full professor.

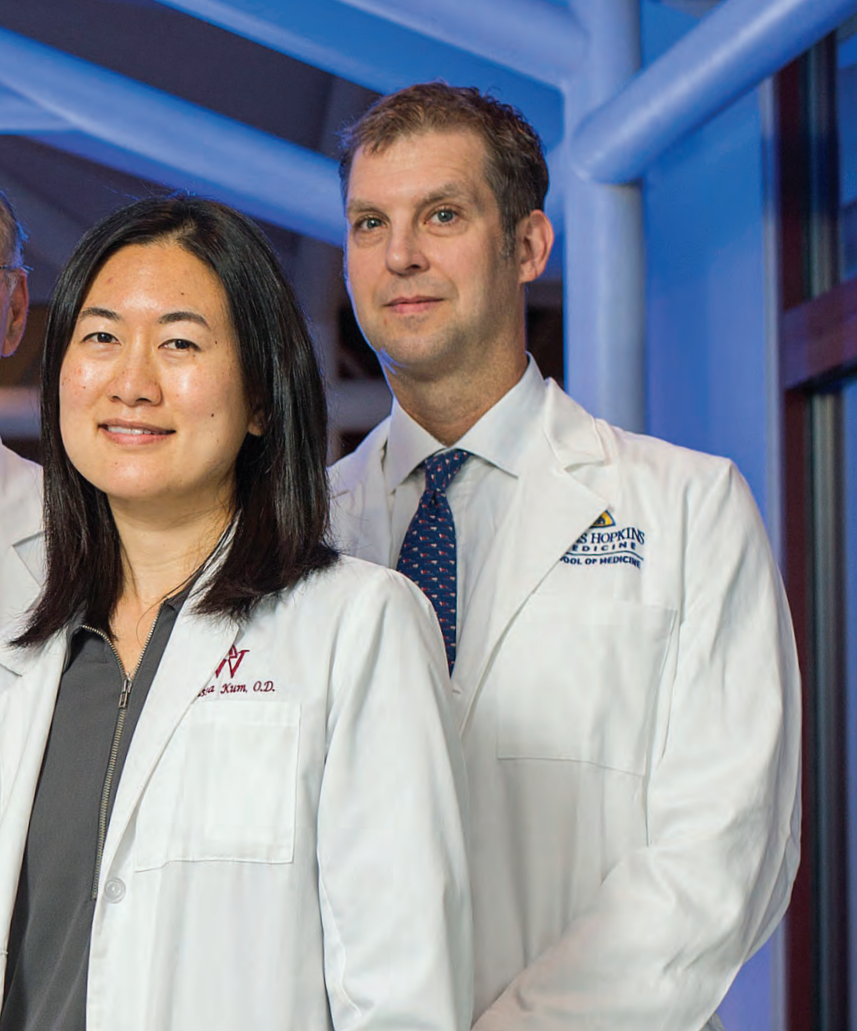
“We were really lucky to get Mac Bosley,” McCulley says. “There’s not a close second as a world leader in genetic understanding of neuro-ophthalmology. Recruiting him to Wilmer was much easier thanks to the endowment by the Knights Templar.”

Bosley has equally kind things to say of Wilmer. “I was entranced by Hopkins and the reputation of Wilmer,” he notes. “The Division of Neuro-Ophthalmology is arguably the most storied of any such program at any hospital in the world. And the care is just extraordinary.”

In addition to Bosley, the division added Drew Carey, M.D., who is dual-trained in neuro-ophthalmology and retina, adding depth to the division with his unique expertise in overlapping diseases. Likewise, the division hired Amanda Henderson, M.D., also extremely well-trained in neuro-ophthalmology, and Clarissa Kum, O.D., an optometrist.

These new faculty and staff members have had a significant effect on neuro-ophthalmic patient care at Wilmer, McCulley says. In less than two years, Wilmer has assembled the largest, most comprehensive team of neuro-ophthalmologists in the country, and maybe the world. Previously, the small division was continually overburdened by demand. The average wait time for patients had swelled to three months, the point at which most people either gave up to find another doctor or saw their condition run its course.

“We have reduced that three-month wait to a single week,” McCulley says. “That’s better care for the community.”

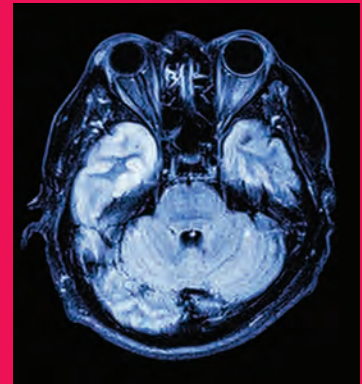


Neil Miller, M.D., the previous head of the division and the Frank B. Walsh Professor of Neuro-Ophthalmology, has witnessed the evolution of the field over the years. When Miller first became interested in neuro-ophthalmology in the 1960s, there were only a handful of doctors nationwide who claimed it as a specialty. Slowly, over the last half-century, Miller has seen the number of specialists attending the annual conference of the North American Neuro-Ophthalmology Society grow to 400 or more.

He chalks up much of that growth to advances in technology that have transformed the field from largely one of diagnostics to one with the potential to prevent, halt or, quite possibly, reverse the nerve conditions that can disable or lead to blindness.

Imaging technologies today can tell us not only where a problem is occurring, but also why, according to McCulley. Meanwhile, new surgical techniques and stem cell therapies are providing hope that we might someday grasp the “holy grail” of neuro-ophthalmology—repairing the optic nerve itself to restore vision.

“It’s a brave new world out there,” Miller concludes. ▲



ONE PATHWAY, TWO DIRECTIONS

Neuro-ophthalmology is actually a collection of subspecialties all centered on the nervous system as it relates to vision.

“Neuro-ophthalmology is really a bridge between neurology, a specialty in its own right, and ophthalmology,” says Tim McCulley, M.D., chief of the Division of Neuro-Ophthalmology at Wilmer.

Doctors in the field characterize the nervous systems of the eye in two categories. The first, known as the afferent visual system, carries visual information from the eye to the brain. The second, known as the efferent visual system, allows the eyes to track a moving object, blink when threatened or constrict the pupil in response to a bright light.

“Between the afferent and the efferent, there is plenty that can go wrong and plenty for us to learn,” McCulley says.



OPERATING ROOM OF THE FUTURE

WILMER'S NEW SURGICAL TRAINING FACILITY IS
TRANSFORMING HOW EYE SURGEONS LEARN THEIR CRAFT.

For decades, the method for training new ophthalmic surgeons has been largely based on an apprenticeship model. In a typical three-year program, the resident spends the first year mostly observing, before operating on a patient under careful supervision. As operating room technology has evolved rapidly in recent years, so too have the challenges of educating new generations of surgeons.

Wilmer's recently opened Center of Excellence for Ophthalmic Surgical Education and Training—OphSET, for short—could transform how eye surgeons learn their craft and might soon bring surgeons from around the world to Wilmer to hone their skills.





† Shameema Sikder, M.D., director of OphSET, demonstrates a surgical procedure for the residents.



† Charles Castoro, M.D., instructs first-year resident Inna Stroh, M.D., Ph.D., during a surgical simulation activity.

“We’re turning surgical training on its head,” says Shameema Sikder, M.D., director of OphSET, who was charged a few years ago with reimagining the future of surgical training. Sikder’s first step was to formalize the curriculum to require dedicated time in the wet lab with one-on-one training from a senior physician. A wet lab is a sort of surgical practice facility, often equipped with microscopes and other surgical equipment, where residents can refine their techniques before operating on real patients.

Looking over a spartan wet lab stocked with scant and aging equipment, Sikder decided her next move would be to reclaim a little-used operating room, shape it into an all-new wet lab and outfit it with a new microscope.

“What we did at the time [2014] was very good, but Wilmer Director Peter McDonnell and I felt we needed to think bigger,” says Sikder, who notes that McDonnell continues to advise OphSET.

Sikder was soon granted additional space, which she completely refitted with state-of-the-art surgical equipment. The build-out was made possible by a generous partnership of industry, private donors and Wilmer alumni. Today, OphSET is far more than just an enhanced wet lab.

It is among the most technologically advanced surgical training centers in the country, if not the world. The center is located on the fourth floor of the Wilmer building, just steps from clinical rooms; Sikder refers to it as “the operating room of the future.”

“OphSET really represents the realization of Wilmer’s potential for surgical innovation and multidisciplinary training,” she says.

The center enjoys not one, but six interconnected trainee microscopes, all tied into an instructor station. The instructor can switch among any of the six trainee microscopes, peering at images that appear on adjacent monitors to see exactly what trainees are doing as they conduct their practice surgeries—and can switch the images onto the main monitor at the front of the room so that everyone can see a specific trainee’s work.

The microscopes were produced by Swiss manufacturer Haag-Streit and are specially designed for the delicate tissues and small scale of eye surgery. These systems have exceptional optical capabilities and integrated three-dimensional video capabilities that can be projected for larger groups to see.



† Shameema Sikder, M.D., lectures residents in the first surgical training session at OphSET.

“OphSET REALLY REPRESENTS THE REALIZATION OF WILMER’S POTENTIAL FOR SURGICAL INNOVATION AND MULTIDISCIPLINARY TRAINING.”

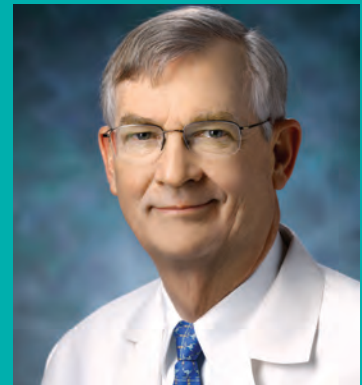
SHAMEEMA SIKDER, M.D.

“When students train in a wet lab of this quality, they are that much closer to a real operating room and that much closer to becoming a surgeon,” says Mike Luley, vice president of the surgical division at Haag-Streit, which was a key player in the philanthropic partnership that made OphSET possible. “I’m not aware of another medical school with OphSET’s capability, and we were proud to contribute.”

It all adds up to an unmatched learning environment for Wilmer residents and instructors.

When it is a resident’s turn to demonstrate what she or he has learned, the instructor and the other trainees can view the performance of any one of the surgeons-in-training, either on the resident’s monitor or on the main monitor. The instructor conducts everything from a tablet computer.

“As instructors, we can see what students’ hand-eye coordination is, gauge their microsurgical skills. If they need improvement, they can do some additional exercises on all this state-of-the-art equipment,” Sikder explains. “It’s a remarkable place to learn.” ▲



† Nicholas Illiff, M.D.

ONLY THE BEGINNING

Wilmer’s new Center of Excellence for Ophthalmic Surgical Education and Training—OphSET—is among the most technologically advanced training labs in the world.

No facility of this scale and quality is undertaken in a vacuum, and Shameema Sikder, M.D., is quick to bestow credit upon many of her colleagues. Particular among them is one of her mentors, Nicholas Illiff, M.D., a renowned surgeon who is now retired from Wilmer. Illiff advised Sikder through the development of the center and is a donor to OphSET. Likewise, many of Illiff’s grateful patients have made gifts to the center in honor of his retirement.

“All my career, I have been acutely interested in the education and training of surgical residents,” Illiff says.

“Dr. Sikder and her team have taken surgical training to another level. Students from all over the world will come to OphSET, and it’s a huge advantage for Wilmer to have a training facility of this caliber.”

While OphSET is off to a great start, much remains to be done, says Sikder. “We have to develop curricula, build learning platforms for international trainees and add more advanced equipment. This is only the beginning.”



A NEW CHIEF

ALBERT JUN ASSUMES THE HEAD OF CORNEA, CATARACT AND EXTERNAL EYE DISEASES.

Fuchs' dystrophy is a rare disease that affects a thin layer of cells in the cornea known as the endothelium. These so-called pumper cells help maintain the critical fluid balance within the eye.

When things go wrong, it can be as though the patient is looking through wax paper.

This little-known but debilitating disease has been the focus for much of the professional career of Albert Jun, M.D., Ph.D., and his innovative approaches to Fuchs' have garnered him a considerable reputation in the medical field—recognition that recently led to Jun being named chief of the Division of Cornea, Cataract and External Eye Diseases at Wilmer.

This division is the second largest within Wilmer. It has a tradition dating back to the 1930s and the storied legacies of Jonas Friedenwald and Edward Maumenee. More recently, that tradition was carried on by Walter Stark, M.D., who just completed a multidecade run as chief.

Albert Jun, M.D., Ph.D., and Kathleen Oktavec, M.D., M.H.S., a fellow in the Division of Cornea, Cataract and External Eye Diseases, in an exam room of the Stark-Mosher Center. In his new position, Jun has prioritized mentoring the next generation of ophthalmologists and helping them launch their careers.



Kathleen Okt

JOHNS HOPKINS
MEDICINE
WILMER EYE INSTITUTE



¹ Albert Jun, M.D., Ph.D., and first-year resident Inna Stroh, M.D., Ph.D., in the waiting room of the Stark-Mosher Center for Cataract and Corneal Diseases.

“These men dominated the field for the better part of a century. It is a tremendous honor to walk in their footsteps,” Jun says of the title bestowed upon him and the weighty challenge ahead.

Jun earned his bachelor’s degree in biochemistry at Harvard before adding doctorates in medicine, genetics and molecular biology at Emory University. He did his residency at Wilmer and then accepted a cornea and external disease fellowship in London before joining Johns Hopkins for a Maumenee Clinician-Scientist Fellowship. In 2005, he conducted the first Fuchs’-related partial corneal transplant at Wilmer (see sidebar).

His first challenge as chief, Jun says, will be to expand the range of clinical care services within the division. From gene and cell therapies to new surgical techniques and technologies, the field has blown wide open in recent years. Jun intends for Wilmer to remain at the forefront.

Part and parcel of that effort will be to strengthen the division’s role as an educator and as a developer of young talent. Jun says that 12 of the 18 cornea faculty members are assistant professors, and three new faculty members arrived in July. Jun wants them to see Wilmer as the best place to develop their careers.

“We have a duty to these bright young doctors. We want to provide them opportunities to grow,” Jun says. Those possibilities will come naturally from Wilmer’s reputation and steady flow of patients, he says, but also from chances to travel. “If there’s something really cool going on in Austria, for instance, we want our people to go there and learn. We need to be truly global,” says Jun.

To that end, Jun would like to initiate a fund that would allow doctors in his division to attend international meetings and visit other hospitals to learn and share. “Such things are often not normally budgeted, but in this rapidly changing, global environment, it’s critical,” he says.

Against the backdrop of today’s breathtaking scientific advances, Jun offers a word of caution. “We have to offer new techniques, of course, but we also need to play a screening role in determining whether these new approaches actually work. We must ask: Do they bring benefit?” Jun says.

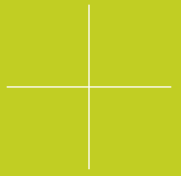
That commitment to patient-centered care extends not just to evaluating the efficacy of the newest approaches, but also to perfecting those that Wilmer has already adopted.



“Not many medical institutions have the sort of quality control and safety apparatus that are available at Wilmer and Johns Hopkins every day through the Armstrong Institute for Patient Safety and Quality,” says Jun. “I would like the division to tap into those resources to ensure the very best patient care.” ▲

“WE HAVE A DUTY TO THESE BRIGHT YOUNG DOCTORS. WE WANT TO PROVIDE THEM OPPORTUNITIES TO GROW.”

ALBERT JUN, M.D., PH.D.



DEFEATING FUCHS’

Albert Jun, M.D., Ph.D., has made a name for himself treating Fuchs’ dystrophy. The painful blisters, swollen corneas and blurred vision that are the symptoms of Fuchs’ are the leading causes of corneal transplants in the U.S. and Europe.

In 2005, Jun was the first at Wilmer to try a delicate technique of transplanting just a partial thickness layer of cornea in a Fuchs’ patient rather than the entire cornea. It proved so challenging that surgeons eventually stopped using the technique, but they did not give up hope. Recently, such fine surgeries have come back into use, thanks to new technologies that allow the transplantation with much less physical manipulation of the tissue.

Likewise, Jun’s research into the genetic roots of Fuchs’ and his ongoing efforts to perfect surgical techniques and tools have made a profound impact on the prognosis for the victims of Fuchs’. Jun’s innovative surgical approaches can even fully restore sight for patients with vision loss from the disease. His research has uncovered possible treatments for Fuchs’ involving medicines or gene therapies that may someday enable patients to avoid corneal transplants altogether.

“It’s life-changing work,” Jun says.



← Mandeep Singh, M.B.B.S., M.D., Ph.D., consults
with Karl Hudspith, Ph.D., a member of Singh's lab.

FINDING HOPE IN REGENERATION



MANDEEP SINGH IS AT THE VANGUARD OF FAST-TRACKING
STEM CELL TREATMENTS FOR EYE DISEASE.

For every day of Jorge Marcos' 90 years, he has suffered from retinitis pigmentosa. This chronic degenerative condition, in which the cells of the retina die, has brought Marcos and his son, Ruben, from Monterrey, Mexico, to the world-renowned halls of the Wilmer Eye Institute and into the care of Mandeep Singh, M.B.B.S., M.D., Ph.D.

"We've been closely following the medical progress on this

disease since the 1970s, and we consider Wilmer to be at the cutting edge of retinitis pigmentosa research," Ruben says, explaining the reason that he and his father now travel such a great distance for the elder Marcos' treatment.

"My father received a thorough evaluation, but it was the insights I received from Dr. Singh and others that were truly enlightening to me," Ruben says.

Singh is among a handful of specialists in the world who are exploring the surgical transplantation of stem cells to regenerate photoreceptors, in the hopes of halting, or even reversing, the degeneration that causes diseases like retinitis pigmentosa. This work is at the very forefront of medical care. Much of it has never been done before.

“Our goals have really crystallized recently,” Singh says. “We’re working to find the right number of stem cells to inject, at the right age and in the right place to achieve the best outcome possible. This is new-age surgery, and the old methods aren’t really optimally suited to these tasks. We need to create all the surgical steps from scratch.”

“WE WANT TO HELP FIND A CURE FOR RETINITIS PIGMENTOSA AS FAST AS POSSIBLE, AND WE CONSIDERED WILMER TO BE THE PLACE. IF PEOPLE WITH RETINITIS PIGMENTOSA WHO CAN HELP DON’T, THEN WHO ELSE WILL?” **RUBEN MARCOS**

As a doctoral student at Oxford, Singh was able to return sight to blind mice using immature photoreceptor cells that had been surgically transplanted. After surgical training in Singapore, Oxford and London, Singh chose Wilmer as the place to begin his career. He is now singularly focused on honing the surgical methods necessary to get stem cells to take hold and to generate new tissues in human eyes.

He is working with human-derived stem cells generated in the lab and investigating their survival after surgery by transplanting them into animal models. The long-range goal: transplantation into humans.

“With impeccable training and his cutting-edge research, Mandeep is uniquely poised to be one of the next generation of surgeons who can fast-track stem cell treatments,” says Neil Bressler, M.D.,

chief of the Retina Division at Wilmer, who was instrumental in bringing Singh to Johns Hopkins. “He’s one of the best seeds, and he’s chosen the fertile soil of Wilmer to grow his career in this exciting field.”

As apparent and encouraging as Singh’s future might seem to Bressler and the Marcoses, it is just getting started. The financial going can be tough, even in a promising field. The Marcoses, however, were so impressed by Singh’s care and his research that the family decided to make a considerable philanthropic gift to support his groundbreaking work. It was one of the family’s first gifts outside of their native Mexico.

“Retinitis pigmentosa is not a widespread or life-threatening disease, and funding is limited,” says Ruben. “We want to help find a cure for it as fast as possible, and we considered Wilmer to be the place. If people with retinitis pigmentosa who can help don’t, then who else will?”

Last summer, Singh’s work received another financial boost: He won a Clinician Scientist Career Development Award from the school of medicine, which comes with institutional financial support that is renewable annually.

“Stem cells are still part of the dream,” Singh says. “It’s not going to be easy creating this sort of a treatment, especially at these early stages. It will take visionary people, like Mr. Jorge Marcos and his family, with the foresight and faith to believe in a long-range goal.” ▲



† Far right, Mandeep Singh, M.B.B.S., M.D., Ph.D., runs a meeting with members of his lab, left to right, Diana Ottulich; Karl Hudspith, Ph.D.; Ying Liu, M.D., Ph.D.; and Simrat Sodhi.

A hand holding a purple object, possibly a medical device or a piece of equipment, with a sign that says "12.500 SAME DAY VISITS". The sign is yellow with black text. The background is a blurred clinical setting.

DELIVERING ON SAME-DAY SERVICE

PROMPT SERVICE AND AN EXCEPTIONAL EXPERIENCE HAVE SPURRED A 35 PERCENT INCREASE IN PATIENTS FOR THE DIVISION OF COMPREHENSIVE EYE CARE.

Last June, Wilmer hosted a celebration of a significant milestone: Led by the Division of Comprehensive Eye Care, Wilmer now offers same-day appointments for every patient.

The comprehensive care division includes doctors who treat patients with problems ranging from the routine to extremely complex. They provide diagnostic, medical and surgical services; screening and treatment for common eye diseases; and evaluation of visual loss or complaints, including prescription glasses and contact lenses. Wilmer ophthalmologists perform general checkups, conduct Lasik surgery and treat ailments ranging from cataracts and dry eye to pink eye.





† Agents of the call center, Wilmer ophthalmologists and the dean of the medical school faculty celebrate the success of the same-day appointment initiative. Left to right, Kerri Telak; Dana Butcher; Danielle Hodge; Bryan Rexroad; Ashley Behrens, M.D.; William May, M.D.; Sharnelle White; Wilmer Director Peter J. McDonnell, M.D.; William Gurley; and Dean Paul B. Rothman, M.D.

“The division is the front line of eye care at Wilmer. It is often where we see people for the first time. Our ability to see them within 24 hours is critical to delivering on our mission,” says Michael Repka, M.D., a Wilmer ophthalmologist who assists with the initiative.

Many new patients are caught off guard by that level of service, Repka says. “They don’t expect it from a world-renowned institution like Wilmer, but they certainly respect and value it when they realize that we deliver on the promise,” he adds.

The same-day appointment initiative began two years ago with a challenge from Wilmer Director Peter J. McDonnell, M.D., to offer an appointment within 24 hours to every patient or referring doctor who would like one. Division leaders then took things a step further by striving to ensure that all patients are seen within 15 minutes of arrival. It all makes for an exceptional patient experience.

“Not all patients are even prepared to take advantage of the program, but we have made good on the offer for every patient who accepts,” Repka says.

If patient traffic is any indication, the need for comprehensive care is considerable. Not only does the division care for patients from Maryland, but also for patients who have traveled from every state and more than 80 countries. At the outset, the need was estimated at approximately 1,000 same-day appointments per month. The division then assessed and instituted operational changes, grew staff, and brought on new ophthalmologists and optometrists.

An early indication of the program’s success: The Division of Comprehensive Eye Care saw a 35 percent spike in the number of patients on its rolls. An unanticipated and welcome outcome has been an increase in new philanthropy from patients who were delighted by the unexpectedly prompt and caring service they received on the same day they called Wilmer for the first time.

“The response has just been fantastic,” Repka says. “We’re really proud of this initiative. It really sets the standard nationwide and upholds the reputation that Wilmer enjoys as one of the world’s leading eye care centers.” ▲



“The division is the front line of eye care at Wilmer. It is often where we see people for the first time. Our ability to see them within 24 hours is critical to delivering on our mission.”

—MICHAEL REPKA, M.D.



← Left, Albert Turner at the office of his company, Carrollton Enterprises.
Lower left, Albert and Therese Turner with their eldest daughter, Louise, when he first returned from 22 months at war.
Lower right, Albert Turner in the Pacific theater during World War II when he was a Navy SeaBee (a member of the U.S. Naval Construction Forces).

HAPPY 100TH ALBERT TURNER!

GENEROUS WILMER PHILANTHROPIST
CELEBRATES A MILESTONE BIRTHDAY.



In his century on this earth, Albert Turner has experienced a lot—a childhood on a tobacco farm, a successful real estate development career that began when he was in his early 20s, a stint of island hopping while a Navy “SeaBee” to build airstrips in the Pacific during World War II, the love of his children and grandchildren, and time with his prized collection of Ferraris.

In the midst of such a remarkable life, news that he had a cataract had him at his doctor’s office asking for advice. “He told me to put a hand over one eye and then switch eyes,” recalls Turner. He and the doctor both realized then that he would need surgery. After some research, Turner found that the best eye care in the world was located at the Wilmer Eye Institute at The Johns Hopkins Hospital,

only a short drive from his home in Davidsonville, Maryland. Walter Stark, M.D., performed the surgery and remained Turner’s eye doctor until his retirement.

“Albert Turner is a force of nature,” says Wilmer ophthalmologist Yassine Daoud, M.D., who now cares for Turner. “I hope I am still going like that when I am his age. It is a privilege and honor to care for a patient like him.”

Turner has been so impressed and grateful for his care at Wilmer that “somewhere along the way,” he says, he transitioned from patient to gracious donor. “The generosity of people like Albert Turner is a lifeblood for Wilmer,” says Peter J. McDonnell, M.D., director of the Wilmer Eye Institute. “The fact that he has been a member of the Wilmer family for 40 years is a testament to his personal strength. What a life. Happy birthday, Albert Turner!”

Asked why he thought it important to go above and beyond, Turner grows quiet for a moment and turns to the massive arched window in his office. Outside the window are shopping centers, homes and hotels that represent the handiwork of a lifetime in the building industry.

“It is important to support the things you care about,” he says. “I felt a close affinity with the physicians and their research at Wilmer. It is valuable to so many people, and I enjoy helping others to see this beautiful world around them.” ▲



† At the ceremony in August, left to right, Wilmer Director Peter J. McDonnell, M.D.; Anne Hultgren, Ph.D., executive director of the Arnold and Mabel Beckman Foundation; Jeremy Nathans, M.D., Ph.D., with his Beckman-Argyros Award; and William H. May, director of the board of directors of the Arnold and Mabel Beckman Foundation

IT'S IN THE GENES

NATHANS HONORED WITH 2016 BECKMAN-ARGYROS AWARD FOR VISION RESEARCH.

A visionary in the vision sciences, Jeremy Nathans, M.D., Ph.D, was the first scientist to apply molecular genetics approaches to the visual system. “He has shown us how to use the tools of molecular biology to unlock the mysteries around the genetics of color vision and color blindness, and how blood vessels develop in the retina in normal development and disease,” says Wilmer Director Peter J. McDonnell, M.D. “This pioneering work is the perfect example of groundbreaking science.” And it is also why the Beckman Foundation honored Nathans with the 2016 Beckman-Argyros Award for Vision Research, “the equivalent of a Nobel Prize for research in vision and the eye,” says McDonnell, who helped present the award to Nathans in August.

With this honor comes a \$400,000 research grant to Nathans’ lab and a \$100,000 personal prize, which Nathans donated to the Hamilton Smith Fund, an endowment that supports young biomedical researchers at Johns Hopkins. “The support for our laboratory that comes with the Beckman-Argyros Award has arrived at a critical time,” says Nathans.

“The next steps that we want to take in investigating the retinal vasculature are being made possible by this support. We are at an incredibly exciting point, and the Beckman Foundation is making those next steps possible.”

“Dr. Nathans’ discoveries will form the basis for new therapies for previously untreatable disorders,” says McDonnell. “All of us at Wilmer and at Johns Hopkins stand in admiration of his remarkable achievements and are delighted to see him recognized with this prestigious award.”

While grateful for the financial support, Nathans also appreciates the intent behind the creation of this accolade. “It is great to be associated in this way with the legacy of Dr. Beckman and the ongoing legacy of Ambassador Argyros [U.S. ambassador to Spain from 2001 to 2004],” Nathans says. “Both men represent socially responsible philanthropy at its best. The Beckman Foundation has been an extraordinary force for improving the world through its support of education and scientific research.” ▲

2016 EVENTS



↑ Shameema Sikder, M.D., shows OphSET's surgical simulation machine to David Guyton, M.D.



↑ Wilmer Director Peter J. McDonnell, M.D., introduces former Wilmer assistant chiefs of service, also known as chief residents, to OphSET's wet lab.



↑ Barbara Hawkins, Ph.D., is recognized for her contributions to Wilmer by Peter J. McDonnell, M.D., at the Chief Residents Symposium.



↑ Left to right, David Knox, M.D.; Kenneth Kenyon, M.D.; David Guyton, M.D.; Barbara Hawkins, Ph.D.; Mark Tso, M.D.; and Allan Jensen, M.D., tour OphSET.

THE 75TH WILMER RESIDENTS ASSOCIATION CLINICAL MEETING AND CHIEF RESIDENTS SYMPOSIUM JUNE 9-10, 2016

On June 9, what was likely the largest gathering of former assistant chiefs of service, or chief residents, in our history occurred. Attendees were treated to presentations from former assistant chiefs of service about their time at Wilmer, a tour of the new Center of Excellence for Ophthalmic Surgical Education and Training (OphSET) and a dinner cruise. The next day, fellows and residents presented the research studies they had executed over the past year and then entertained alumni and faculty members later in the evening with the tradition of their annual skit.

DEDICATION OF THE GOLDBERG PROFESSORSHIP

SEPT. 15, 2016

Wilmer Director Emeritus Morton F. Goldberg, M.D., was on hand to present his eponymous professorship to Jennifer Elisseeff, Ph.D., the director of the Translational Tissue Engineering Center. Wilmer Director Peter J. McDonnell, M.D., introduced Elisseeff, who gave a fascinating talk that began with Wolverine, of X-Men comic book fame, and ended with biomaterials-directed regenerative immunology. After the talk, McDonnell unveiled the plaque commemorating Elisseeff as the recipient of the Morton F. Goldberg, M.D., Professorship in Ophthalmology to a celebratory audience of Elisseeff's family, friends and co-workers.



† Jennifer Elisseeff, Ph.D., presenting her talk, "Bench to Bedside: Moving Science Fiction into Scientific Discovery"



† Left to right, Sanford D. Greenberg, Ph.D.; Morton F. Goldberg, M.D.; Myrna Goldberg; Jennifer Elisseeff, Ph.D.; Sophie Elisseeff; and Alessandro Ovi

EVENTS CONTINUED

Left to right, Hank Goldberg; Wilmer Director Emeritus Morton F. Goldberg, M.D.; Carol Brown Goldberg, the sculptor; and Harry Quigley, M.D., in front of the Red Disks sculpture →



DEDICATION OF THE RED DISKS SCULPTURE

OCT. 6, 2016

In the lush Smith gardens amidst early fall hues, Wilmer Director Emeritus Morton F. Goldberg, M.D., and Harry Quigley, M.D., dedicated *Red Disks* in honor of artist Carol Brown Goldberg. Inspired by Carol's admiration of David Smith's notion of line in space or drawing in space, *Red Disks* offers her impression of color in space. As a painter, Carol has used the visual harmony of color to evoke true serenity in the viewer. We are immensely grateful to Carol and Hank Goldberg for this gift of art that acknowledges the exemplary work of our physicians and healers at Wilmer.

WILMER RECEPTION AT THE AMERICAN ACADEMY OF OPHTHALMOLOGY (AAO) ANNUAL MEETING

OCT. 15, 2016

Current Wilmer faculty and staff members, as well as alumni, came together in Chicago for a reception held during AAO's Annual Meeting. More than 50 Wilmer faculty members made presentations throughout the multiday conference, while numerous others participated in a leadership capacity. Their presence proudly demonstrated the impact that Wilmer continues to have on ophthalmology worldwide.



↑ Left to right, Constance Okeke, M.D.; Wilmer Director Peter J. McDonnell, M.D.; Aaleya Koreishi, M.D.; and Jawad Qureshi, M.D.



↑ Left to right, Amanda Kiely Bicket, M.D.; Meraj Wolle, M.D., M.P.H.; Farhan Merali, M.D., M.B.A.; and Valliammai Muthappan, M.D.



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Your investment in the Wilmer Eye Institute makes it possible for our physicians to offer unrivaled patient care to you and to countless others who may find their sight threatened by illness or injury. We invite you to partner with the Wilmer Eye Institute on our quest of discovery and to help us find the next treatment or cure.

For information on how to join us in our mission to end blindness and life-altering eye diseases, please contact:

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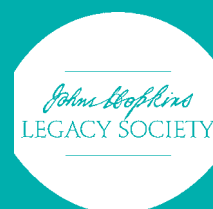
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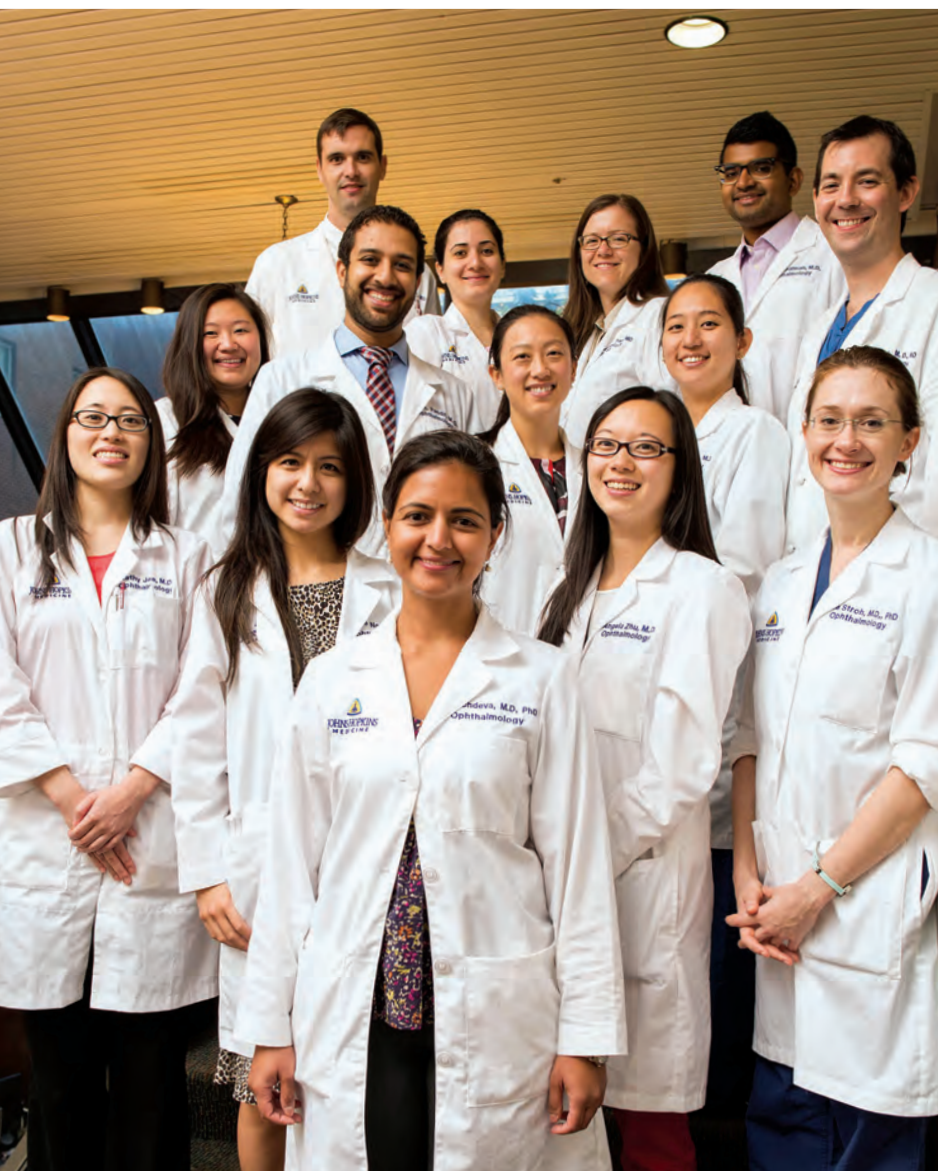
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Row one, Mira Sachdeva

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Row two, left to right, Kathleen Jee, Angeline Nguyen, Angela Zhu, Inna Stroh, not pictured: Sophie Cai

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Row three, left to right, Mary Qiu, Ravi Pandit, Cindy Cai, Dolly Chang, Thomas Johnson III

THIRD-YEAR RESIDENTS

Row four, left to right, Bradley Barnett (second-year), Nazlee Zebardast, Suzanne van Landingham, Jithin Yohannan, not pictured: Jefferson Doyle

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The scientists and staff members of the Johns Hopkins Wilmer Eye Institute gratefully acknowledge our partners in philanthropy listed here. The generosity of these friends supports a tradition of collaboration and far-reaching investigation as, together, we pursue the complex challenges of eye diseases. While our space here is limited, our thankfulness is not. Although gifts of any amount are gratefully received, only gifts, pledges and pledge payments totaling more than \$250 in the fiscal year ending June 30, 2016, could be listed in this report. If any donor was accidentally missed, or if you prefer to remain anonymous, please contact the Development Office at 410-955-2020.

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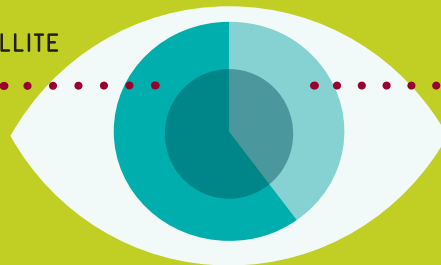


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Annual Report 2016

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On the Cover: A mother gazes into her child's eyes in Recife, Brazil, where doctors from the Johns Hopkins Wilmer Eye Institute spent some time this past summer observing the efforts of Brazilian ophthalmologists and other doctors treating babies affected by the Zika virus. Photo Courtesy of Altino Ventura Foundation

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