

Viewpoint

A publication of
The Edward S. Harkness Eye Institute
and The Department of Ophthalmology in the
Vagelos College of Physicians and Surgeons

SPRING/SUMMER 2019

Simon John, PhD, Renowned Glaucoma Researcher, to Join Department

Noted geneticist and glaucoma researcher Simon John, PhD, will join the Department of Ophthalmology at the Edward S. Harkness Eye Institute in the fall of 2019. A pioneer in the use of mice for glaucoma studies, Dr. John comes to Columbia from the Jackson Laboratory in Bar Harbor, Maine, where he has been Professor and Principal Investigator for the past twenty years.



Simon John, PhD

“This is a notable recruiting achievement for the Department,” says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor, and Chairman of the Department of Ophthalmology. “Dr. John’s bold creativity and leadership in his research have transformed the study of glaucoma.”

Dr. John earned his doctorate in Biology and Human Genetics at McGill University, Montreal, Canada, investigating the molecular biology and population genetics of phenylketonuria under the mentorship of the eminent human geneticists Rima Rozen, PhD and Charles Scriver, MD. He then pursued a postdoctoral fellowship

studying essential hypertension and cardiovascular disease at the University of North Carolina-Chapel Hill with the late Nobel Laureate Oliver Smithies, PhD, who once described him as a “world authority on glaucoma.” After completing his fellowship, Dr. John joined the Jackson Laboratory and applied his expertise to ocular disease and glaucoma. Dr. John’s international leadership in genetics, genomics and ocular disease led to his 2008 appointment to the prestigious Howard Hughes Medical Institute (HHMI) at an unusually young age, the youngest investigator appointed in a highly competitive process.

His work as an HHMI investigator has focused on the molecular basis of glaucoma with the aim of developing new therapeutic strategies, using a multidisciplinary approach that combines

engineering and technology with molecular, genetic, and physiologic methods to identify the genes and molecular mechanisms underlying this neurodegenerative disease. Dr. John was the first to measure intra-ocular pressure (IOP) in a mouse, and has worked with bioengineers at Purdue University to develop miniaturized,

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Cornea Transplantation

David Foley: A Family History of Retinal Disease Inspires Philanthropy

For David Foley, a Senior Managing Director of The Blackstone Group and CEO of Blackstone Energy Partners, the inspiration to provide generous philanthropic support for the Department of Ophthalmology’s retinal programs comes from his own direct experience and a history of retinal issues in his immediate family.

“I grew up in Chicago, where my siblings and family still reside. We are all pretty nearsighted, which is a contributing factor to retinal tears and detachments. My mother had a retinal detachment 30 years ago that wasn’t promptly diagnosed and

left her effectively blind in one eye. Within the last decade both of my brothers and one of my two sisters each had retinal detachments, in one case resulting in total vision loss in one eye despite multiple surgeries. So we clearly have a familial predisposition to retinal problems, and I had some concern about my own retinal health, which I proactively discussed in depth several years ago with my ophthalmologist here in New York,



David Foley

a well-regarded clinician with an office on Park Avenue and a large practice.”

When he began to develop early cataracts that started to impact his vision in late 2015, Mr. Foley consulted his ophthalmologist, who recommended cataract surgery, expressed confidence that such a procedure was unlikely to have a negative impact on his retinas and did not recommend an examination by a retina specialist prior to the cataract surgery. Unfortunately, in October 2015, just nine days after the cataract surgery on his right eye and the day before he was scheduled to undergo cataract surgery on his left eye, Mr. Foley experienced a full detachment of the retina in his right eye. As time was of

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VIEW FROM THE CHAIR

Dear Friends,

Each year, approximately 2.4 million eye injuries occur in the United States. Ocular trauma is second only to cataracts as the most common cause of visual impairment, but it remains under-recognized and under-addressed in ophthalmology training programs and continuing medical education for both ophthalmologists and emergency physicians. Existing guidelines and standards on trauma management also devote relatively little attention to eye trauma.

I'm pleased to report that this serious gap is now being addressed by the American Academy of Ophthalmology under the leadership of Columbia's James Auran, MD, who is heading a new Ocular Trauma Group that will develop national training standards for ocular trauma. Here at Columbia, Dr. Auran is spearheading a new evidence-based, structured ocular trauma curriculum for residents that will serve as a national model for other institutions.

Our pioneering Columbia Ophthalmology Applied Genetics Service began accepting patient referrals this spring. Building on our 20 years of basic science work in the genetics of ophthalmic disease, this Service offers patients with complex eye disorders access to the latest in genetic testing and diagnosis, counseling, and care management guided by leading experts in the field, including its renowned director, Irene Maumenee, MD.

All the work that we do would be impossible without the continuing generosity of individual donors, funds and foundations who understand the importance of our mission to reduce the burden of eye disease in the United States and around the world. Recently, we were honored to receive two extensions of major grants from Research to Prevent Blindness (RPB), one of the world's leading sponsors of eye research funding. We are also grateful to David Foley, whose own experience with retinal



disease and outstanding care from Stanley Chang, MD, and Tongalp Tezel, MD, inspired him to make major contributions to our retinal program.

I'm delighted to welcome two new faculty members to the Department of Ophthalmology: leading glaucoma researcher Simon John, PhD, and Tingting Yang, PhD, a promising young scientist with particular expertise in the structure and function of ion channels and their relationship to normal vision.

Sadly, we have also recently lost two dear friends and giants in the field of ophthalmology. Myles Behrens, MD, a driving force in Columbia's neuro-ophthalmology program, passed away in April 2019, while John T. Flynn, MD, longtime chief of the pediatric ophthalmology division, died in March 2019. Both great mentors and friends as well as great leaders, these men will be deeply missed by all who knew them.

Finally, I'd like to direct your attention to a new regular column in the *Viewpoint*, "Making History at Harkness." This section will shine a spotlight on the many historic firsts and other major achievements in vision care and research that have taken place over the more than 150 years since Cornelius Agnew first established an ophthalmology clinic at the College of Physicians and Surgeons. Our inaugural column features some highlights of the history of corneal transplantation at Columbia, including insights from another longtime patient, donor and friend, Ronald Phipps.

We thank you for your continued support, and hope that you enjoy the opportunity to learn more about what's happening behind the scenes here at Harkness.

Sincerely,



G.A. (Jack) Cioffi, MD
Jean and Richard Deems Professor
Edward S. Harkness Professor
Chairman, Department of Ophthalmology

Faculty Appointments

Dana Blumberg, MD, MPH, promoted to Associate Professor of Ophthalmology at the Columbia University Medical Center, effective September 1, 2019

Jason Horowitz, MD, promoted to Associate Professor of Ophthalmology at the Columbia University Medical Center, effective May 1, 2019

David Paik, MD, promoted to Associate Professor of Ophthalmic Science (In Ophthalmology) at the Columbia University Medical Center, effective April 1, 2019

Konstantin Petrukhin, PhD, promoted to Professor of Ophthalmic Science (in Ophthalmology) at the Columbia University Medical Center, effective April 1, 2019

Stephen H. Tsang, MD, PhD, promoted to Laszlo Z. Bito Professor of Ophthalmology and Professor of Pathology and Cell Biology (with tenure), effective July 1, 2019

Simon John, PhD, Renowned Glaucoma Researcher, to Join Department

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implantable, wireless sensors to detect changes in IOP.

"By combining his unique skills with bold experimentation and by forging close collaboration with ophthalmologists, Dr. John has been able to adapt tools from the human clinic to mice and develop novel techniques and models that provided a wealth of new mechanistic information regarding glaucoma, helping to reinvigorate the field," says Jeffrey Liebmann, MD, the Shirlee and Bernard Brown Professor of Ophthalmology, Glaucoma Service Director, and Vice-Chair of the Department of Ophthalmology. "He continues to lead the field in new directions."

Most recently, Dr. John has published research connecting age-dependent metabolic changes with the development of glaucoma, and demonstrating that vitamin B3 promotes healthy metabolism providing potent protection against glaucoma in mice. At Columbia, he will work with other leading glaucoma experts to design a clinical trial to translate these findings to humans.

"Dr. John is known for his collegiality and willingness to help others as well as for his effective, caring mentorship," says Dr. Cioffi. "We are looking forward to welcoming his dynamism to the Edward S. Harkness Eye Institute and adding a new dimension to our superb group of scientists and clinicians."

Groundbreaking Columbia Ophthalmology Applied Genetics Service Opens

Columbia's new Applied Genetics Service began officially accepting patient referrals in May, 2019. One of only a handful of genetic eye disease programs nationwide and the first in the tri-state area, the Service offers people with suspected genetic eye disorders access to a comprehensive range of services, including screening, diagnostics, genetic counseling, and research study participation, all under one roof.

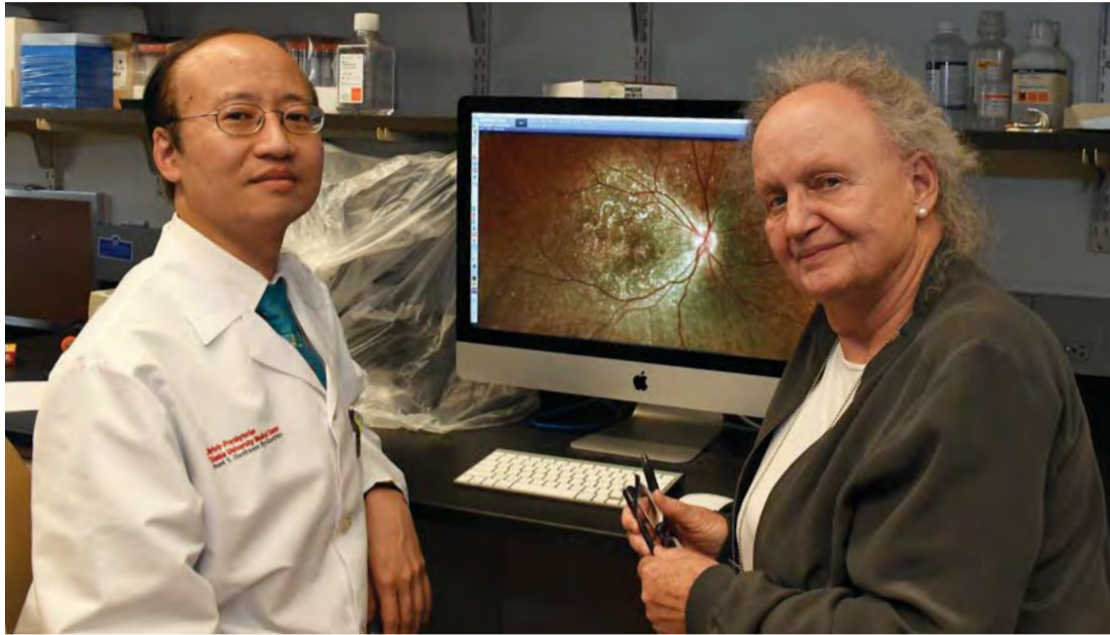
Made possible in part by funding from Jonas Philanthropies, the Applied Genetics Service builds on the proud tradition of basic science investigations in ophthalmic genetics that has been a hallmark of the department for more than 20 years. "The foundational work of Drs. Chang, Sparrow, Allikmets, Tsang, Petrukhin and others provided the perfect environment

for us to develop a service that applies our cutting-edge science to help patients in need," said Dr. Cioffi.

The Columbia Ophthalmology Applied Genetics Service is led by Irene Maumenee, MD, Professor of Ophthalmology and Director of Clinical Ophthalmic Genetics, one of the world's leading experts in genetic eye diseases. Dr. Maumenee is widely regarded as the founder of genetics as an ophthalmic subspecialty. Co-directing the program are Jeffrey Liebmann, MD, the Shirlee and Bernard Brown Professor of Ophthalmology, Glaucoma Service Director, and Vice-Chair of the Department of Ophthalmology, and Stephen Tsang, MD, PhD, Laszlo Z. Bito Professor of Ophthalmology and Professor of Pathology and Cell Biology.

Dr. Maumenee anticipates that the Service will grow rapidly. "I expect that we will be seeing at least 100 patients a week by the end of the year," she says. All patients will undergo diagnostic testing and DNA analysis, along with genetic counseling. Lead genetic counselor Megan Soucy, MS, CGC, is board certified by the American Board of Genetic Counselors, and previously built the genetic counseling services in the medical oncology and maternal fetal medicine departments at Mount Sinai South Nassau.

"Ms. Soucy will explain why specific tests are being recommended, what the results could be and what those results would mean," explains Tara Conniff, Program Manager for Ophthalmic Genetics. Program staff will also help patients in need of financial support for DNA diagnosis. "Once the results are



Stephen Tsang, MD, PhD and Irene Maumenee, MD

available, patients will meet with the genetic counselor again to discuss the findings and next steps, such as which ophthalmologist is most appropriate to manage their care."

If the analysis is negative—that is, there is no currently known gene associated with their condition—the patient will be offered the opportunity to participate in our gene discovery research program, with their demographic and clinical data stored in a database and their DNA samples maintained in our Ophthalmic BioBank.

For patients whose eye disease has been linked to a specific gene, their case will be presented to a review panel of experts. "The group will develop a management plan based on the patient's genetic findings," explains Dr. Liebmann. "We might recommend increased monitoring for disease progression, testing for a patient's children or other family members, or sometimes changes to treatment—such as earlier surgery for certain types of glaucoma."

The Service builds on an established system of referrals to precision ophthalmology studies ongoing in the Department. For several years, Dr. Tsang has led a weekly genetic sequencing clinic, to which patients are referred by their

ophthalmologists for possible inclusion in one of several trials and studies ongoing at Columbia. These currently include:

- A precision imaging study led by Janet Sparrow, PhD, Anthony Donn Professor of Ophthalmic Sciences (in Ophthalmology) and Professor of Pathology and Cell Biology.
- A study of the natural history of juvenile macular degeneration led by Rando Allikmets, PhD, William and Donna Acquavella Professor in the Departments of Ophthalmology and Pathology and Cell Biology, and Research Director at the Edward S. Harkness Eye Institute.
- Studies of microperimetry testing in the assessment of diseases affecting the retina and optic nerve, conducted by Donald C. Hood, PhD, James F. Bender Professor of Psychology and Professor of Ophthalmic Science (in Ophthalmology) and Vivienne Greenstein, PhD, Professor of Ophthalmology.

The new genetics clinic will also soon be evaluating patients for a new precision stem cell treatment trial directed by vitreoretinal surgeon Tarun Sharma, MD, Associate Research Scientist in the

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Tara Conniff and Megan Soucy, MS, CGC

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VIEWPOINT

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Columbia Leads National Effort to Standardize Ocular Trauma Training and Management

James Auran, MD, Professor of Ophthalmology at Columbia University Medical Center, has been selected by the American Academy of Ophthalmology (AAO) to lead a new initiative aimed at developing comprehensive national guidelines, proficiency standards, and residency and continuing education for the management of ocular trauma.

“There’s a great deal of pent-up demand for this area to be addressed,” says Dr. Auran, who also serves as Chief of Ophthalmology at Harlem Hospital, a Level I Trauma Center, which in 2016 entered into an affiliation agreement for residency training with the Edward S. Harkness Eye Institute. “Ocular trauma is one of the most under-recognized causes of vision loss in the developed world. Each year, an estimated 2.4 million eye injuries occur in the United States. But while there are volumes of protocols and proficiency standards for trauma management, these documents include relatively little on the eye. And although ocular trauma is one of the most common reasons for visits to the emergency department, many emergency rooms are in community hospitals, where the covering ophthalmologist may not have particular expertise in ocular trauma.”

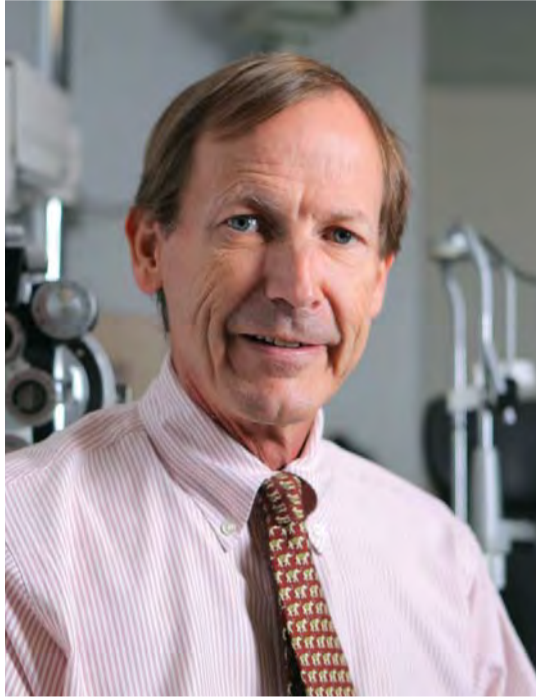
In addition to Dr. Auran, the AAO’s new Ocular Trauma Group is composed of physicians from the military (both Army and Navy), the Johns Hopkins Wilmer Eye Institute in Baltimore, Wills Eye Hospital in Philadelphia, Massachusetts Eye and Ear in Boston, and the University of Alabama at Birmingham. It held its first meeting in January 2019.

Dr. Auran reports that the group will focus on both short-term and long-term goals. Within the next one to two years, they plan to develop online continuing medical education programs to be housed on the AAO’s website; write guidance papers on controversies and challenges in ocular trauma; and create a comprehensive ocular trauma section of the AAO’s EyeWiki online eye encyclopedia, featuring evidence-based, peer-reviewed articles on all aspects of ocular trauma. Since the initiative began in early 2019, at least 45 such articles have already been compiled on the site. In addition, the 2020 Annual Meeting of the American Academy of Ophthalmology will include a special symposium on ocular trauma.

In the long term, over the next three to five years, the group expects to build a national database of ocular trauma resources, develop a consistent ocular trauma curriculum for ophthalmology residents, set proficiency standards and protocols in ocular trauma for hospitals and health systems, and establish a certification program for trauma ophthalmologists, which could include subspecialty fellowships in ocular trauma.

At Columbia, Dr. Auran is leading the establishment of an evidence-based, stepwise residency training curriculum for ocular trauma that will be among the models for residency training nationwide. “In the past, we have taught ocular trauma more on a case-by-case basis rather than in a focused, structured curriculum,” says Royce Chen, MD, the Helen and Martin Kimmel Assistant Professor of Ophthalmology and Residency Program Director. “This new standardized approach, which will be rolled out to first-year residents at the beginning of this academic year, will add another level of excellence to our training program so that our patients will continue to have the best outcomes possible.”

Residents will learn the management of a variety of ocular trauma situations from a multidisciplinary team of experts including Dr.



James Auran, MD

Auran and Dr. Chen, as well as oculoplastic surgeon and orbital specialist Michael Kazim, MD, Clinical Professor of Ophthalmology and Surgery; retinal specialist Jason Horowitz, MD, Associate Professor of Ophthalmology and Medical Director of the Residents’ Eye Clinic, and ophthalmic plastic and reconstructive surgeon Lora Glass, MD, Assistant Professor of Ophthalmology. “The program will include wet lab simulation experience, where the residents will work on special skills such as suturing the sclera closed when there is an injury, paired with a didactic curriculum that features both lecture content as well as online videos and cases,” says Dr. Chen.

Another essential feature of the program will be specialized instruction on imaging orbital trauma, focused primarily on computed tomography (CT) scanning. “CT scanning is the study of choice in orbital trauma for several reasons. The scan takes only seconds to perform, it gives excellent cortical detail for evaluation of fractures, and it can quickly be formatted into 3D for improved understanding of complex fractures,” says Mary Maher, MD, a senior radiology resident with a special interest in orbital imaging. She has worked with Dr. Auran to develop a

continuing medical education program featuring detailed anatomic instruction along with an array of illustrative case studies, which will be adapted for residency training.

The course will also instruct residents and physicians on proper protocols for imaging orbital trauma. “If you follow the same search pattern for every case, you can trust that for each image, no stone goes unturned and no important finding will be left behind,” Dr. Maher says.

Eye injuries frequently occur alongside other trauma to the head and neck. Columbia’s ocular trauma program benefits from the ability to partner with a wide variety of top experts in other specialties. “For example, our oculoplastic surgeons will work with neurosurgeons to plan out a case, prepare the patient and the family, and conduct the surgery,” says Dr. Maher. “It’s very important to have communication and collaboration between the specialties when there is complex head and facial trauma.”

Dr. Chen lauds Dr. Auran’s leadership of the new national effort alongside the expansion of Columbia’s own ocular trauma program. “We are excited to be a part of the impetus that Jim has inspired to establish standardized, evidence-based practice and lead the way in the management of ocular trauma.”

Applied Genetics Service Opens

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Department of Ophthalmology, in collaboration with incoming researcher Tingting Yang, PhD, and the New York Stem Cell Foundation.

At present, there is only one FDA-approved gene therapy for eye disease, Luxturna (voretigene neparvovec-rzyl), which is used to treat a form of inherited retinal dystrophy associated with mutations in the RPE65 gene. “However, there are approximately a dozen other gene therapies for eye disease now in clinical trials, some of which are in Phase III studies,” says Dr. Maumenee.

“Much of the research and discovery associated with genetic eye diseases has taken place in the Department of Ophthalmology, making Columbia an ideal home for this world-class clinical ophthalmic genetics program,” says Dr. Liebmann.

FACULTY SPOTLIGHT

New Faculty: Department Welcomes Structural Biology/Electrophysiology Expert Tingting Yang, PhD

Tingting Yang, PhD, a promising research scientist with unique expertise in both electrophysiology and structural biology, will join the Department of Ophthalmology as Assistant Professor of Ophthalmic Sciences (in Ophthalmology) in September 2019, with the help of funding from the CUIMC Target-of-Opportunity Faculty Recruitment Award. Formerly an assistant professor in pharmacology and physiology at the University of Rochester, Dr. Yang's research focuses on the structure and function of ion channels, and the pathological mechanism and treatment of their associated diseases, known as channelopathies.

One of her main areas of interest is in Bestrophin1, a calcium-activated chloride channel which plays an important role in normal vision. In a 2014 paper in *Science*, Dr. Yang detailed vital clues to the pathological mechanisms involved in mutations to the BEST1 gene, which are associated with macular degeneration.

Dr. Yang received a bachelor's degree in biological sciences and a master's degree in microbiology from Fudan University in China, before earning a second master's degree in applied mathematics and statistics and a PhD in biomedical engineering at Johns Hopkins University.

Her appointment to the Department of Ophthalmology is a homecoming for Dr. Yang. Before joining the faculty at the University of Rochester, she was a post-doctoral research scientist in the laboratory of Wayne Hendrickson, PhD, University Professor in the Department of Biochemistry and Molecular Biophysics and Violin Family Professor of Physiology and Cellular Biophysics at Columbia.

During that time, Dr. Yang established an ongoing collaboration with Stephen Tsang, MD, PhD, the Laszlo Z. Bito Professor of Ophthalmology and Professor of Pathology and Cell Biology. In 2018, Dr. Yang and Dr. Tsang published an important report in the journal *eLife*, where they addressed longstanding questions about the physiological role of Bestrophin1 in human retinal pigment epithelium (RPE), established a 'disease-in-a-dish' model based on patient-derived RPEs, and provided a proof of concept of gene therapy for treating patients with Best Disease, an inherited form of macular degeneration usually diagnosed in childhood or adolescence.

"We are very excited to have Dr. Yang return to Columbia," says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor,

Edward S. Harkness Professor, and Chairman of the Department of Ophthalmology. "In addition to her ongoing collaboration with Dr. Tsang, Dr. Yang's work complements our existing strengths in RPE pathology, led by Janet Sparrow, PhD, and drug development, led by Konstantin Petrukhin, PhD. Her unique expertise in both electrophysiology and structural biology is an extremely powerful combination for the study of ion channels that are associated with ocular disease."



Tingting Yang, PhD

RPB Renews Two Major Department of Ophthalmology Grants

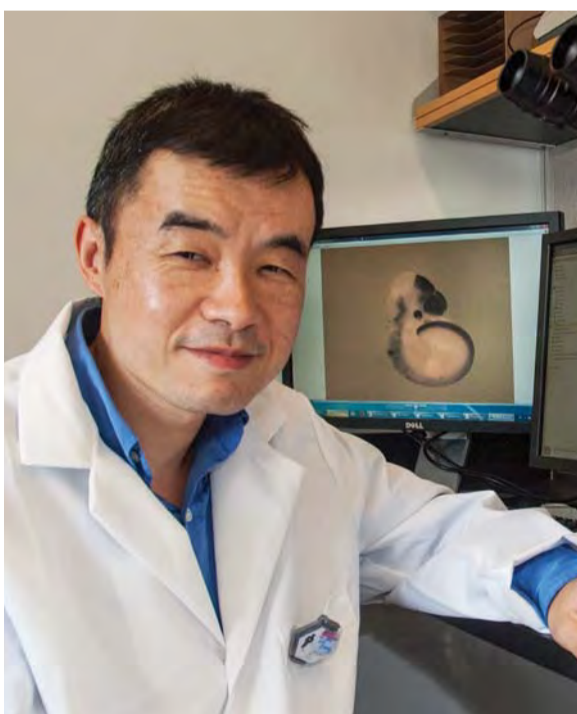
Research to Prevent Blindness (RPB), the leading voluntary health organization supporting eye research directed at the prevention, treatment or eradication of all diseases that threaten vision, has recently renewed two major grants to the Department of Ophthalmology.

The first, an RPB Unrestricted Grant, provides five years of generous support for the Department's wide-ranging portfolio of scientific research activities. "This unrestricted departmental grant, our second since I became chair, is critically important to the Department," says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor, and Chairman of the Department of Ophthalmology.

"Our department continues to expand substantially thanks in large part to long-time partners like RPB. These unrestricted grants have also become much more competitive, so the renewal of this funding demonstrates RPB's approval of the growth that we have achieved."

The second grant is a two-year extension of the original five-year Jules & Doris Stein Research to Prevent Blindness Professorship, awarded to Xin Zhang, PhD, Associate Professor of Ophthalmic Sciences (in Ophthalmology and Pathology and Cell Biology). The Professorship is named after RPB founder Jules Stein, MD, and his wife Doris, dedicated philanthropists, who believed deeply in the power of research to help people maintain what Dr. Stein called "the magnificent gift of sight."

Dr. Zhang's research uses mouse genetic tools to study signaling mechanisms during the growth and development of ocular cells. "We hope that our studies of growth factor signaling will help us to understand how congenital eye disorders are developed, as well as to inspire future treatment for these diseases," Dr. Zhang says.



Xin Zhang, PhD

"The Stein professorships were created to draw basic scientists from outside of ophthalmology into departments of ophthalmology, a goal that was achieved when Dr. Zhang joined us from the University of Indiana five years ago," says Dr. Cioffi. "He has been extraordinarily successful during that time, having earned tenure, maintained three current active R01 grants from the National Institutes of Health, and launched a number of collaborative projects both within and outside the Department. With this award, RPB has made clear that Dr. Zhang has more than lived up to their expectations for his contributions to the field."

Dr. Stein created RPB in 1960 to identify barriers impeding U.S. eye research and to develop a program to stimulate extensive vision research across the country. Since then, RPB has channeled more than \$362 million into eye research and has been associated with nearly every major breakthrough in vision research in that time. "Columbia's close partnership with RPB dates back to the 1970s, when renowned corneal transplant pioneer A. Gerard DeVoe, MD, was the chair of the Department," says Stanley Chang, MD, the K.K. Tse and Ku Teh Ying Professor of Ophthalmology and the former Edward S. Harkness Professor and Chairman of the Department of Ophthalmology. "RPB, along with the Commonwealth Fund, was instrumental in raising funds to construct the research wing of the Harkness Eye Institute, home to one of the first basic science departments in an ophthalmology department in the country."

In Memoriam: Myles Behrens, MD

Myles Behrens, MD, retired Professor of Ophthalmology and Chief of the Neuro-Ophthalmology Division at Columbia University Medical Center, died on Friday, April 5, 2019, in Boca Raton, Florida. Dr. Behrens was 80 years old.

A world-renowned neuro-ophthalmologist, Dr. Behrens was considered a diagnostic master by referring physicians, colleagues and patients, who lauded his meticulous approach to neuro-ophthalmologic disorders. He combined the attributes of an academic tertiary medical center consultant with the caring and humanity of an “old country doctor.” “His consultations and subsequent consultation letters to referring physicians, dictated in front of the patient, were academic masterpieces of clinical diagnostic insight,” says Jeffrey Odel, MD, Professor of Ophthalmology.

Dr. Behrens’ father, Alvin Behrens, MD, a Brooklyn-based ophthalmologist and graduate of Columbia College of Physicians and Surgeons, died when Dr. Behrens was a boy, leaving young Myles to care for his little sister while their mother worked to support them all. Despite his family responsibilities, Dr. Behrens was remembered by his English teacher at Brooklyn Poly Prep School as the best student he had taught in his 40-year career.

After graduating *magna cum laude* from Yale in 1958, Dr. Behrens attended the College of Physicians and Surgeons, where he was elected to Alpha Omega Alpha and awarded the Janeway prize for the highest achievement and abilities in the graduating class of 1962. After an internship plus a year of medical residency at Presbyterian Hospital, Dr. Behrens spent two years as a Clinical Associate at the National Institutes of Health in the Division of Allergy and Infectious Diseases. He then returned to Columbia in 1967 for his ophthalmology residency, under then chairman A. Gerard DeVoe, MD.

As a resident, Dr. Behrens was influenced by Frank Carroll, MD, an optic neuropathy researcher who conducted a visual field clinic, teaching the residents to perform manual visual fields at the tangent screen. He also became the favorite of Irene Loewenfeld, PhD, the foremost pupillary researcher and author of *The Pupil, Physiology and Clinical Applications*, considered the magnum opus in Neuro-Ophthalmology. Dr. DeVoe and the faculty prevailed upon Dr. Behrens to seek advanced subspecialty training in neuro-ophthalmology, in order to return to Columbia and become its first clinician to practice exclusively in the field.

Dr. Behrens spent a year as a fellow with neuro-ophthalmology pioneer William Hoyt, MD, at the University of California at San

Francisco, followed by a summer at the National Hospital for Neurologic Diseases in London under Alan Bird, MD, and Michael Sanders, MD, another of Dr. Hoyt’s former fellows.

He arrived in San Francisco with no background in neuro-ophthalmology, but quickly memorized the *Clinical Neuro-Ophthalmology* text co-authored by Dr. Hoyt and Frank Walsh, MD. His acumen so impressed Dr. Hoyt that Dr. Behrens quickly became his favorite student. “Dr. Hoyt was a ruthlessly demanding clinician and educator, and Myles was the only doctor who ever lived up to his standards,” says Dr. Odel.



After this advanced training, Dr. Behrens returned to Columbia to redesign the neuro-ophthalmology consulting and teaching program, and remained a vital leader in the Department of Ophthalmology until his retirement in 2011. “He expended great energy in getting the history of each patient and conducting the most thorough physical exam,” says Dr. Odel. “He took pains to make sure he knew everything about his patients, and stayed in touch with them personally.” Dr. Behrens received the prestigious Heed Ophthalmic Foundation Award in 1986 for his leadership and teaching excellence as well as his significant clinical and research contributions to the field. He had himself been an honored Heed Fellow in 1970.

“Whatever Myles was interested in, he studied in depth,” says Dr. Odel. “When he learned French, he made several trips to France and went to French movies. He devoted similar attention to the study of the Talmud. He often traveled to the Bronx early in the morning, before his clinical hours, to study with rabbis there, who thought of him as an extraordinarily knowledgeable Talmudic scholar.”

“He was the consummate gentleman scholar, and everyone who knew him seems to agree that he was the smartest person they had ever met,” says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor, and Chairman of the Department of Ophthalmology. “Myles had a deep devotion to his patients and taught generations of fellows, residents and medical students who benefited from his wisdom and curiosity.”

Dr. Behrens is survived by Marsha, his wife of 37 years; his son Adam Behrens, MD, and his wife, Elle Behrens; his daughter, Michelle Heller and her husband Michael Heller; two step-sons, Cary Siegel, MD, and his wife Emily Jonas Siegel, and Dean Garret Siegel and his wife, Alexandra Ernst; and nine grandchildren.

In Memoriam: John T. Flynn, MD

John T. Flynn, MD, who retired from Columbia as Professor of Ophthalmology in 2015, passed away on March 19, 2019 at his home in Bolton Landing, New York. He was 88 years old.

A nationally recognized leader in pediatric ophthalmology, Dr. Flynn joined the Department of Ophthalmology in 2000 as the first Anne S. Cohen Professor of Pediatric Ophthalmology. Over the next ten years, he served as Department Vice Chairman and Chief of the Pediatric Ophthalmology Division. After stepping down from those positions, he remained with the Department for several more years until his retirement in 2015.

In 1965, after earning his medical degree at Northwestern University Medical School, Dr. Flynn began his storied career in ophthalmology at the University of Miami School of Medicine, where he became Professor of Ophthalmology in 1980. Dr. Flynn was the fifth founding father of the Bascom Palmer Eye Institute and a member of the board at the Bascom Palmer Eye Institute/Anne Bates Leach Eye Hospital’s Ophthalmology Research Foundation.

Among Dr. Flynn’s many contributions to pediatric ophthalmology was his work on the classification, screening, and treatment of retinopathy of prematurity. He designed and helped to lead a number of seminal studies in the field, and was the author of *Retinopathy of Prematurity: A Clinician’s Guide*. Dr. Flynn was the



recipient of a Gold Award, the highest honor given by the American Academy of Pediatrics; a Senior Award for Distinguished Service from the American Association for Pediatric Ophthalmology and Strabismus; and two Outstanding Teacher Awards from the University of Miami School of Medicine. At Columbia, he is honored with the John T. Flynn Annual Resident/Fellow Research and Graduation Day.

“John Flynn was a unique individual in that he had two very impactful careers, the first as one of the founders of the Bascom Palmer Eye Institute in Miami and the second here in New York as Vice Chair of the Department of Ophthalmology at Columbia,” says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor, and Chairman of the Department of Ophthalmology. “He was the most gracious mentor and educator that

I’ve ever met, and his enthusiasm for both life and learning was unparalleled. He taught a generation of pediatric ophthalmologists who benefited from his wisdom and strong intellect. His scientific curiosity, unwavering integrity, and warm collegiality will be greatly missed.”

Dr. Flynn is survived by his wife, Roseanne; two children, Thomas Flynn, M.D., a part-time ophthalmologist with the Department and daughter, Ellen Flynn, M.D.; his daughter-in-law Susan Scherbel; and four grandchildren.

Cornea Transplantation

The Edward S. Harkness Eye Institute has long been a leader in corneal surgery and research. On February 21, 1933, Assistant Clinical Professor of Ophthalmology Ramon Castroviejo, MD, performed the first successful human cornea transplant in the United States. Previous transplants, although initially successful, had ultimately failed as the transplanted corneas became opaque. Dr. Castroviejo, who had done experimental transplants on rabbits as a fellow at the Mayo Clinic, hit on a novel solution: creating a rectangular “window” for the transplant would yield better outcomes than the circular ones that had previously been employed, since their edges could better merge with and become a living part of the eye.

“After the first operation, he performed these procedures with increasing frequency and gave courses to teach this new operation,” says Stephen Trokel, MD, Professor of Ophthalmology. “Patients with these square transplants were seen in eye institute clinics for many years, well into the end of the 20th century.”

After Dr. Castroviejo left the Harkness Eye Institute for private practice, clinical and research innovation in corneal transplantation continued at Columbia under the leadership of A. Gerard DeVoe, MD, Harkness Professor of Ophthalmology and Chair of the Department from 1959 to 1974, and Anthony Donn, MD, Harkness Professor of Ophthalmology and Chair of the Department from 1989 to 1995. “Dr. DeVoe was the first to introduce the use of the operating microscope to perform transplant surgery, and insisted that his residents use it for all anterior segment surgery,” says Dr. Trokel.

In 1961, Dr. DeVoe and Dr. Donn collaborated to launch the nation’s first basic and clinical cornea research center, with major funding from the National Institutes of Health. Among the center’s research faculty were Frank Polack, MD, and Hernando Cardona, MD, who developed early models of keratoprotheses—artificial corneas to replace diseased corneas. In 1965, the first successful “Cardona implant” was placed in a patient’s eye.

“Research was an important part of corneal clinical pursuits, and it was in the burgeoning Corneal Center that the survival of endothelial cells in the donor graft was first demonstrated,” says Dr. Trokel. “Investigators in the cornea center also did extensive work on tissue culture media that would extend the viability of donor graft material.”

Early corneal transplantation always involved removing a full-thickness section of tissue from the diseased or injured cornea, and replacing it with a matching “button” from donor tissue. “With this approach, any significant trauma to the eye—like a car accident with an air bag

injury, or getting hit in the head while playing sports—could cause the transplant to open up because of weakness at the graft-host junction,” explains Leejee Suh, MD, Miranda Wong Tang Associate Professor of Ophthalmology and Director of the Cornea, Cataract and Refractive Surgery Service.

Today, many patients are able to receive partial corneal transplants, such as endothelial keratoplasty, which selectively replaces only the innermost layer of the cornea and leaves the overlying healthy corneal tissue intact. The Cornea Service at Columbia now provides two different methods of endothelial keratoplasty, Descemet’s Stripping Automated Endothelial Keratoplasty (DSAEK) and Descemet’s Membrane Endothelial Keratoplasty (DMEK). Columbia has been an early adopter and innovator in both DSAEK and DMEK.

“The standard of care for patients with full corneal pathology is still a full thickness transplant, but the majority of patients with corneal edema or swelling can receive partial transplants, which involve better rehabilitation of the existing corneal anatomy rather than replacing it. This results in faster visual recovery, better outcomes, and more patients achieving 20/20 vision,” says Dr. Suh.

No one knows that better than Ronald Phipps, who has had a nearly lifelong relationship with Columbia’s Department of Ophthalmology. As a young teenager in the early 1960s, he was diagnosed with keratoconus, a progressive eye disease in which the normally round cornea thins and begins to bulge into a cone-like shape. Mr. Phipps soon had to abandon his beloved baseball team and found himself facing a difficult future. “When you see the world with cloudiness, it’s hard on a young person. It’s not just about driving and sports. You can’t discern people’s emotions. You don’t know if they’re smiling or frowning, angry or happy. This creates a lot of vulnerability, and I suffered not just physically but psychologically.”

Mr. Phipps was ultimately referred to Columbia, where Dr. DeVoe performed two full thickness keratoplasties: the first, on his right eye in 1967, and the second, on his left eye about a year later. “I stayed in the hospital for four or five days, and the sutures were very thick, irritating and uncomfortable,” he says. “But the transplants were very successful. I could see again! They lasted for a long time, as I was able to continue my graduate work in theoretical physics, have a family, play sports, and travel all over the world. These transplants helped give me a rich, full productive life.”

Over the next half-century, Mr. Phipps did not always live in New York, but he returned to Columbia frequently for monitoring. “I was able to attend Dr. DeVoe’s

80th birthday party at which Ray Charles performed. Right in the middle of the party, Dr. DeVoe pulled out his examining flashlight to look at my cornea,” he says. “And I was in touch with him in the last year of his life, and was able to thank him for what he had done for me.” (Dr. DeVoe passed away in September 2007 at the age of 98.)

“The longevity of the original two grafts reflects not only Dr. DeVoe’s skill and diligence surgically but also great care in making sure there was good graft material,” says Mr. Phipps. But as time went on, some scarring and stretching occurred in the transplanted corneas, and Mr. Phipps also developed a cataract on his right eye. His team at Columbia recommended that if the cataract progressed, he should undergo a refreshed corneal transplant combined with cataract surgery.

In February of 2018—51 years after his original surgery—Dr. Suh performed a full thickness corneal transplant combined with the cataract surgery on Mr. Phipps’ right eye. A year later in February 2019, she performed another transplant with cataract surgery on his left eye. “This time, in both cases, the procedures were outpatient surgery and the recovery was much faster,” says Mr. Phipps. “I was up and out of the hospital and walking around by late afternoon. The sutures were so comfortable that I had no sense of their presence. I am now working on several books, including a treatise on the philosophy of an infinite, open and integrated universe, and a book on poetry. Without Dr. Suh’s great handiwork, it would be very difficult to pursue such projects. I have always appreciated the broad coalition of people at Harkness who collectively make these miracles possible.”

Columbia continues to innovate in corneal transplantation. In 2015, Danielle Trief, MD, Assistant Professor of Ophthalmology, launched one of the first dedicated clinics for pediatric corneal transplantation in the country. She is also one of the only surgeons in the country to perform partial corneal transplants on children. “I believe that it is especially important with children to limit the amount of surgery they have and allow for a quicker recovery,” she says.

Dr. Suh predicts that the future of corneal transplantation lies in banking our own corneal cells. “An example of this might be a 40-year-old individual with a corneal condition such as Fuchs’ dystrophy who will need a transplant in the future,” she says. “We will be able to harvest that person’s cells and replicate them in the lab, and when they need the tissue, they’ll have it. This isn’t science fiction: scientists in Japan are already doing this with promising results.” And just as with other major advances in corneal transplantation, Columbia will be at the forefront of this promising new technology.

David Foley: A Family History of Retinal Disease Inspires Philanthropy

Continued from page 1

the essence, the next morning, instead of the scheduled cataract surgery in his left eye, he had an emergency retinal vitrectomy on his right eye. Although this procedure initially appeared to have been successful, just two months later the retina in his right eye began to detach again and he underwent a second surgery. This time the surgeon placed a scleral buckle.

After such a difficult experience, Mr. Foley was determined to find the best retinal specialists in the city to manage his care, and was referred to Columbia. In a consultation in early 2016 with Stanley Chang, MD, the K.K. Tse and Ku Teh Ying Professor of Ophthalmology and the former Edward S. Harkness Professor and Chairman of the Department of Ophthalmology, and Tongalp Tezel, MD, Chang Family Professor of Ophthalmology and Director of the Vitreoretinal Service, he developed a more thorough understanding of his condition, and agreed upon a plan to monitor the status of his right eye and maximize the probability of achieving a better result with his left eye.

“Dr. Chang and Dr. Tezel are each extremely detail oriented, performing both their routine examinations and their surgeries in a very methodical, patient manner, with pinpoint precision,” says Mr. Foley. “Comparing their work to others in the field is like placing a Georges Seurat, with its thousands of precisely placed dots of paint, next to a Jackson Pollock splatter painting.”

An important early decision was to delay cataract surgery in the left eye as long as practicable, ideally until after the retina in that eye could be strengthened. “As it turned out, two years later, in February 2018, I noticed something that looked like a dropper of black ink in a dish of water at the center of my vision in my left eye while playing tennis,” said Mr. Foley. “That was blood from a tear in my retina. I knew immediately what was happening and I called Columbia Ophthalmology.”

Dr. Tezel lasered the initial tear within 24 hours. Following a thorough examination, he informed Mr. Foley that he was concerned the retina was not stable and was at risk of detaching. “As you can imagine, I was quite anxious about this, but Dr. Tezel took the time to give me a complete understanding of the situation, the

alternative courses of action and their associated pros/cons. He was able to clear his schedule for later that afternoon, secured a surgery slot and performed the retinal vitrectomy – with a perfect outcome!”

Six months later, Mr. Foley underwent planned cataract surgery in his left eye, performed by Leejee Suh, MD, Miranda Wong Tang Associate Professor of Ophthalmology and Director of the Cornea, Cataract and Refractive Surgery Service. “Because of the surgical skill of Dr. Tezel and Dr. Suh, and the state of the art equipment at CUIMC, my results were outstanding, with 20/20 vision in my left eye, in stark contrast to my earlier experience with my right eye,” he says.

Mr. Foley praises the team approach taken by Dr. Chang, Dr. Tezel, Dr. Suh and their colleagues. “All of the faculty in the different programs within the Department of Ophthalmology proactively and efficiently communicate with each other to ensure the best patient outcome. They’re an integrated team. Every visit involves great attention to detail, a very thorough examination and careful patient education.”

The experience inspired Mr. Foley to join the Department of Ophthalmology’s Board of Advisors and to make major donations to the Department of Ophthalmology in support of the retinal program. He has endowed a fund to cover the annual expenses of a clinical Retina Fellow and also established the Foley Retina Research Fund to support the Stem Cell Transplantation and Macular Degeneration Project being conducted by Dr. Tongalp Tezel, a first-of-its kind pilot study combining stem cell therapy, genome surgery and biomedical engineering to treat several forms of macular degeneration. You can read more about the research in the Spring/Summer 2018 edition of *Viewpoint*.

“The fellowship makes a lot of sense, because it is training the next generation of retina surgeons. In turn, they will not only provide the same world-class quality of care to their patients, but will also share their knowledge with colleagues, so there’s a multiplier effect,” Mr. Foley says. “And Dr. Tezel’s research could save the vision and alter the lives of millions of people.” He believes that, had his mother or siblings had access to the quality of care he received at Columbia, they would have experienced much better surgical outcomes after their own retinal detachments. “While I was unable to help them, it is my hope that these funds will enable CUIMC to reach more people with retinal disease and have a positive impact on their lives.”

IMPORTANT PATIENT CARE INFORMATION

Specialties: Cornea/External Ocular Disease
Glaucoma
Pediatric Ophthalmology and Strabismus
Refractive Surgery/LASIK
Vitreoretinal and Uveitis

For inquiries and appointments, please call 212.305.9535

Viewpoint

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