

DUKE UNIVERSITY EYE CENTER

VISION



SPRING/SUMMER 2006 VOLUME 22, NUMBER 1



Chicago Hope

A Medical Odyssey

PATIENT CARE + RESEARCH + EDUCATION



CHAIRMAN'S CORNER

It's hard to believe a year has passed since we celebrated the opening of our state-of-the-art Albert Eye Research Institute (AERI)—the atmosphere continues to be one of great excitement and high expectations for new collaborative research and future discoveries which will lead to new treatments for, and prevention of, potentially blinding eye diseases. We also have just begun a partial renovation of the Wadsworth building, our 35-year-old clinical facility, to accommodate our growing patient population. The completion of these renovations will yield additional examination lanes, but this will give us only some short term relief. Our dedication and vision to be able to apply the latest and best in science to the development of new treatments and cures, and to also train the next generation of leaders in ophthalmology, will require a more modern clinical facility in the near future—a facility that can truly complement AERI. We are already engaged in discussions with Duke Health Center leadership and our Eye Center Advisory Board to try to make this true necessity a reality.

In this issue of *VISION*, you will read about some of the Eye Center's extraordinary accomplishments in patient care, research and the use of new technology. In the cover story, a Chicago family travels to Duke for needed innovative surgery for their three-year-old. In another article, a pediatric eye researcher collaborates with colleagues at the Duke Center for Human Genetics and the Singapore Eye Research Institute to investigate the genetics of myopia (nearsightedness), the world's most common eye disease. A novel corneal transplant surgery is described that requires no sutures and results in a faster recovery for patients. Duke researchers are uniquely honing in on the genetic and biological links between smoking and age-related macular degeneration.

These advances would not be possible without the leadership, ambassadorship, and continued support of our Eye Center Advisory Board, our donors, patients, friends, alumni, faculty, staff, and the Duke University Health System and School of Medicine. I want to express my gratitude to all for your dedication and support.

A handwritten signature in blue ink that reads "David L. Epstein, M.D." in a cursive script.

David L. Epstein, M.D.

Chair, Department of Ophthalmology

VISION

SPRING/SUMMER 2006 VOLUME 22, NUMBER 1

02



Chicago Hope

The Douglass family from suburban Chicago was referred to pediatric glaucoma specialist Sharon Freedman, MD, when their three-year-old son developed glaucoma following surgery for a congenital cataract. At Duke an innovative surgery has given the family new hope.

07



Smoking and Age-related Macular Degeneration

Duke Eye Center's Ivan Suñer, MD, and other researchers have discovered that cigarette smoking raises the risk of age-related macular degeneration. In experiments with mice, they also discovered that exposure to secondhand smoke produces similar changes.

08



Genetic Research

Pediatric ophthalmologist Terri Young, MD, has studied myopia, also known as nearsighted vision, for more than a decade. She is starting an Ophthalmic Pediatric Genetics Program at Duke, and she is collaborating with the Singapore Eye Research Institute.

15

New Faculty

18

Faculty Update

23

Awards & Recognition

25

Eye Center News

Editor

Alice Lockhart

Designer

Chad Roberts

Photographer (Cover Story)

Andrew Campbell

Contributing Writers

Laurel Ertel

Nancy Oliver

Cathy Macek

Mary Littleton-Rich

Tracey Koepke

Copyright © Duke University Eye Center

Marketing and Public Relations Office

DUMC 3802

Durham, NC 27710

919-668-6183

dukeeye.org

Published semiannually for friends of the
Duke University Eye Center



Chicago Hope

A Medical Odyssey

Like many of us, Tracy and Peter Douglass associated cataracts with the senior set since the clouding of our lenses occurs, to varying degrees, to everyone as he or she ages. So you can imagine their shock and dismay when told their newborn son, Drew, had a congenital cataract in his right eye.

“We were just blown away,” says Tracy. “It’s hard enough being first-time parents and then having to deal with Drew’s eye problems—it was very, very stressful.” And thus began a three-year medical odyssey that eventually led the family from their home in suburban Chicago to seek treatment from pediatric ophthalmologist and glaucoma specialist Sharon Freedman, MD, associate professor of ophthalmology at the Duke University Eye Center.



“We were in a touch-and-go situation, since the intraocular pressure would still be elevated until the tube would be open and allow fluid to flow into the reservoir.”

Sharon Freedman, MD

The Douglasses first turned to Peter’s father, a retired internist, for advice, then spoke to five different physicians before consulting pediatric ophthalmologist Marilyn Mets, MD, at Northwestern University’s Children’s Memorial Hospital.

“Dr. Mets was wonderful,” Tracy recalls. “She removed Drew’s cataract when he was eight weeks old and provided excellent care afterward. But we had a lot to deal with after the surgery,” she says. “I had to learn to put a contact lens in his eye every morning. It was hard enough when he was a baby, but as a toddler, it became a three-person job to get it in and out every day. And he also had to wear a patch over his good eye for a few hours every day.”

Their daily routine became even more complicated when Drew, subsequently, developed glaucoma in the lens-less eye. For reasons unknown, glaucoma develops in at least 10 percent of infants who undergo cataract surgery. Mets prescribed drops to lower the pressure in Drew’s right eye. It was a constant battle to keep the glaucoma under control.

“When the eye pressure went up, Drew would get headaches and nausea,” Tracy says. “So Peter and I were always worrying about him. This was such a huge thing in his short life.”

Since elevated intraocular pressure can cause permanent damage to the optic nerve, gaining control of the pressure became imperative. So at six months old, Drew underwent a second eye operation called a trabeculectomy. During the procedure, which is sometimes called filtration surgery, a piece of tissue is removed in the drainage angle—the point in the eye where the colored part of the eye (iris) and the white covering over the eye (sclera) meet. This is where fluid within the inner eye drains.

“Drew’s eye pressure came down for a little while, but then it shot back up,” Tracy recalls. “Dr. Mets told us we were running out of options and recommended that we see a pediatric glaucoma specialist, and she suggested Dr. Freedman.”

Two implants, one operation

“I was called by Dr. Mets, whom I know through our national AAPOS organization (American Association for Pediatric Ophthalmology and Strabismus), for advice,” Freedman says. “We both agreed that a combined surgery for both the implantation of a glaucoma drainage implant to help control the glaucoma, as well as a secondary intraocular lens implant to take the place of the external contact lens required after the removal of the congenital cataract, was the best option.”



“This combined surgery could have been performed by two different surgeons in Chicago working together—the pediatric ophthalmologist and the glaucoma specialist—and this is what I recommended,” Freedman continues. “But because this surgery is infrequently performed in combination, and because the glaucoma specialist does only a minority of procedures on pediatric glaucoma cases, the family elected to travel to Duke for me to do the combined surgery.”

Tracy recalls her first phone conversation with Freedman. “I instantly connected with her; I had never had that experience with a doctor before. After that first phone call, I told Peter, ‘This is the place to go for Drew’s surgery.’” And they traveled to Durham last November for the operation.

The first part of the surgery involved implanting an artificial lens. Cataract removal, followed by implantation of an artificial lens, is the most frequently performed surgery in people over age 65, and many doctors consider it to be the most effective surgical procedure in all of medicine. Lens implantation is far less common in children who

have cataracts but has proven to be safe and effective. The intraocular lens Freedman implanted took the place of Drew’s external contact lens—and the daily struggles involved in placing it in his eye were eliminated.

Next, Drew received the glaucoma implant. Also known as a tube shunt, the glaucoma implant is a tiny tube connected to an oval plate, or reservoir. During the operation, Freedman first attached the plate to the sclera (the sturdy white outer coat of the eye) under the upper eyelid, covered by the transplanted conjunctival and tenon’s layers that overlie the sclera. Then, the tube was directed into the anterior chamber, which is the space between the cornea and iris. The implant directs fluid within the front part of the eye (the aqueous humor) to a space just outside the eye. In some cases (including Drew’s), the tube is tied shut with a stitch that dissolves over several weeks to prevent the eye pressure from dropping too quickly, while the eye is forming a capsule around the reservoir which regulates the flow of the aqueous humor from the eye.

The surgery went well, Freedman recalls, but the eye didn’t heal as smoothly as was hoped. After surgery the eye pressure went up and caused corneal swelling.

“Tracy and Drew stayed in Durham so that I could closely monitor his eye. I felt very bad for the added expense and inconvenience and worry that this caused the family, but they were steadfast in their wishes to do what was the absolute best and safest thing for their wonderful little boy,” says Freedman. Mother and son finally returned to Chicago after two weeks, with plans to return before Christmas so that Freedman could examine the eye.

The Waiting Game

By design, the stitch that closed off the glaucoma implant’s drainage tube would take about six weeks to dissolve. “So we were in a touch-and-go situation, since the intraocular pressure would still be elevated until the tube would be open and allow fluid to flow into the reservoir,” Freedman says.

There is normal variation in the time it takes for the stitch to dissolve, and Drew’s stitch was still in place when the Douglasses returned to Durham in December.

“Dr. Freedman checked his eye every day for more than a week,” Tracy recalls. “It was my Christmas wish to have his eye pressure drop, and I really wanted to stay until it did. Finally, after a record



Drew Douglass and Sharon Freedman, MD

“We are very lucky that we are able to come to Duke for treatment. But really, how could we go anywhere else?”

Tracy Douglass



seven weeks and two days following the surgery and a week before Christmas, the stitch opened on its own! It was the best Christmas gift we could ever receive.”

Today, Drew’s medical odyssey continues. As he approaches his fourth birthday, Drew still needs eye drops and eye patching every day, though no more contact lenses. The glaucoma drainage implant has controlled his intraocular pressure with the help of a glaucoma drop twice a day. The intraocular lens implant is stable and allows Drew to have his best vision in that eye with the help of simple glasses, which also serves a protective purpose. And there’s always the concern about future difficulties, such as shifting or clogging of the glaucoma implant as he grows.

“We are literally taking it visit by visit,” says Tracy, who plans to return to Duke for Drew’s checkups every three months for the foreseeable future. “But we feel blessed that Drew has received such good medical care. And we really feel like he’s going to be fine. His dad played sports in high school and wants Drew to play ice hockey.”

“You can’t make him feel like he’s different, and you cannot hold him back,” says Peter.

The Douglasses continue to sing the praises of their medical care at the Duke Eye Center. “I can’t say enough good things about Dr. Freedman,” says Tracy. “She has called us at home to check on Drew’s progress and saw him on the weekend when we were waiting for the stitch to dissolve. We are very lucky that we are able to come to Duke for treatment. But really, how could we go anywhere else?”



Smoking Raises Risk of Age-related Macular Degeneration

Cigarette smoke and its component, tar, trigger the formation of deposits and thickening in the retina that cause age-related macular degeneration (AMD), researchers at the Duke University Eye Center and the Bascom Palmer Eye Institute have found. In experiments with mice, they also discovered that heavy exposure to second-hand smoke produces similar changes.

The study is the first to examine the mechanism by which smoking causes macular degeneration, the leading cause of blindness in the elderly, the researchers say. Several large epidemiologic studies have shown that smoking more than doubles the risk of AMD, says study coauthor Ivan Suñer, MD, associate professor of ophthalmology at the Duke University Eye Center. But until now, no one had explored how cigarette smoke generates biological changes in the eye that lead to vision loss and, in some cases, blindness.

“Understanding the molecular mechanism that causes these changes may lead to models that allow us to understand how macular degeneration is occurring. By understanding the biology, we may also be able to develop therapies to protect nonsmokers as well as smokers,” Suñer says.

The results appeared in the February 2006 issue of *Investigative Ophthalmology & Visual Science*. The study was funded by the National Eye Institute, the Flight Attendants’ Medical Research Institute, and a Veterans Affairs Merit Review Award.

AMD is a progressive disease that damages the retina, the thin layer of nervous tissue that lines the inside of the eye. The retina receives images from the eye’s lens and transmits them to the brain. In AMD the primary site of damage is the central retina, an area called the macula. The macula handles fine detail vision, such as driving and reading.

There are two types of AMD—the milder dry form and the more severe wet form. In

dry AMD the degeneration of the macula occurs slowly and progressively over months or years. There is no cure, but studies have shown that certain vitamins can slow development of the disease in some people. Only 10 percent of people with dry AMD develop wet AMD, in which abnormal blood vessels leak blood and fluid under the macula, causing rapid vision loss and damage.

The research team examined the relationship between dry AMD and cigarette smoke, including one of its components, hydroquinone—the main ingredient of tar. Typically, scientists study dry AMD in mice by exposing a specific mouse strain prone to the disorder to ultraviolet (UV) light and feeding the animals a high-fat diet.

“These oxidants are thought to initiate the changes that result in dry AMD,” Suñer says. The researchers found that the combination of the three oxidant “hits”—smoke, UV light, and a high-fat diet—exacerbated the effects of smoking on macular degeneration. The team also exposed the animals to cigarette smoke instead of ultraviolet light and found that the mice developed retinal changes indicative of early AMD.

In addition, the researchers tested the effects of smoke on mice that were not fed a high-fat diet or exposed to UV light. These mice developed deposits under the retina, signs of early dry AMD. The researchers found similar changes in mice subjected to heavy secondhand smoke.

“Our study shows that cigarette smoking alone can cause development of macular degeneration changes. Heavy exposure to secondhand smoke can also cause these changes,” Suñer concludes.

Because the byproducts of cigarette smoke accumulate in the lungs and circulate in the body, the researchers also investigated how ingesting one of the potent oxidants in tar would affect mice. They fed the animals hydroquinone, a benzene derivative that is a



Ivan Suñer, MD

major component of cigarette tar. After 4.5 months, the mice had developed the deposits and thickening of early dry AMD whether they ate a low-fat or a high-fat diet. They were not exposed to UV light.

“Tar is just one potential oxidant in cigarette smoke; there are other chemicals like nicotine, carbon monoxide, and carbon dioxide. However, this reinforces the finding that antioxidants and smoking cessation are helpful in protection for dry macular degeneration,” Suñer says. “The interesting thing about hydroquinone is that it is in pollution in the atmosphere, and we are seeing more and more macular degeneration developing in areas with high pollution rates.

“Our group also previously demonstrated that nicotine makes active wet macular degeneration worse. This finding is important because it implies that patients with active wet AMD should not smoke or use nicotine replacement therapies,” Suñer adds.

(Coauthors include Doctors Scott Cousins (first author) of the Duke Eye Center and Diego Espinosa-Heidmann, Paola Catanuto, Eleut Hernandez, and Maria Marin-Castano of the Bascom Palmer Eye Institute at the University of Miami School of Medicine.)

Genetic R

It turns out that Mom may have been correct when she said that too much reading could hurt your eyesight. What she didn't know is that the genes that she or your dad passed to you may play an even bigger role by predisposing you to myopia.

Myopia—also known as nearsighted vision—is the world's most common eye disease, with as many as 25 percent of the population in the United States and Europe experiencing some degree of it. For most people with mild or moderate myopia, the condition is an inconvenience and correctable with eyeglasses, contact lenses, or refractive surgery. Severe myopia, however, is more challenging to correct and carries with it the risk of several blinding disorders, including glaucoma, premature cataracts, retinal detachment, and macular degeneration.

Myopia is on the rise throughout the world, affecting as many as 70 to 90 percent of people in some Asian populations, notes pediatric ophthalmologist Terri Young, MD, who has studied the genetics of myopia for more than a decade. Some believe that prolonged reading or so-called “near work” during childhood leads to the development of myopia, whereas others theorize that children may inherit a genetic tendency to become nearsighted (which may be exacerbated by too much near work). Young is focusing her research on severe myopia by examining the DNA of families who have several affected members.

Young, who joined the Duke Eye Center faculty last year as a professor of ophthalmology and pediatrics, began investigating the genetics of myopia and other eye diseases in her lab at The Children's Hospital of Philadelphia, and prior to that, at the University of Minnesota. Young's lab group found six different gene chromosomal addresses associated with severe myopia. “Identifying these genes can help researchers understand the biology of myopia development in humans,” Young says. “This knowledge may lead to treatments with medications or gene therapy, as well as aid in development of prevention strategies.”

All in the Family

For gene sleuths like Young, the hunt begins with a disease and an affected family—and the more members and generations who are alive and willing to cooperate, the better. Groups such as the Hutterite community of eastern South Dakota are invaluable to genetic researchers like Young. The Hutterites, along with the Amish and Mennonites, trace their roots to the Protestant Reformation movement in 16th-century Europe. Groups of Hutterites began emigrating to the United

States and Canada in the late 19th century and now number some 40,000. Although traditional in their faith and communal lifestyle, Hutterites accept some modern technology, using sophisticated farming equipment and computers.

“The Hutterites are an ideal population to study, genetically speaking, because they come from the same region of Europe—Austria and Germany—they marry within their faith, and they usually have a large number of children,” Young says. “There are a number of Hutterites with severe myopia. By studying inheritance patterns in several families, we located a gene address on chromosome-10 that's associated with severe myopia in this population.”

Although not anywhere near as genetically homogeneous as the Hutterites, people in several Asian countries experiencing an upsurge of myopia also offer opportunities to look for gene-disease connections as well as examine the role of genetic versus environmental factors in the rising prevalence of the disease. Young is collaborating with Seang Mei Saw, MBBS, PhD, head of epidemiology at the Singapore Eye Research Institute of the National University of Singapore, on these types of studies (see sidebar on page 10).



Terri Young, MD, and Seang Mei Saw, MBBS, PhD



Research

That's Anything But Near-Sighted

The Ophthalmic Pediatric Genetics Program

Young wears two hats in her position at the Eye Center—researcher and clinician—and the Ophthalmic Pediatric Genetics Program she is starting provides her with a place to hang both of them. Along with studying severe myopia, Young the researcher is also continuing to study families who have a member or members with microphthalmia (small eye) or anophthalmia (absence of the eye), a project she also began in Philadelphia. Causes of this rare, devastating condition are not known, but inherited, as well as sporadic, genetic mutations are suspected. The Albert Einstein Medical Center in Philadelphia maintains a worldwide registry of individuals with anophthalmia and microphthalmia that includes pregnancy and family medical histories. This valuable information, along with genetic studies like Young's, helps researchers pinpoint possible causes of the disease.

The clinical side of the program includes a unique collaboration with Duke pediatrician and geneticist Marie McDonald, MD, an associate clinical professor of pediatrics. One day a month, Young holds a joint clinic with McDonald to see children who have eye problems related to their genetic disease. "Almost 40 percent of genetic diseases involve the eye in some way," Young notes.

Albinism—a group of genetic diseases that results in a lack of pigment—is a well-known example. For eyes to develop and work properly, they need to have enough pigment, so most kids with albinism have trouble seeing well and are very light sensitive. Although we are most aware of people who lack pigment in their skin and hair, some forms of albinism affect only the eyes (including one type that is linked to a gene on the X chromosome and is passed from mother to son).

A less-known heritable condition is Marfan syndrome, which affects the connective tissues found throughout the body. A dislocated lens is often the first identifiable sign of Marfan syndrome, and most people with the disease are myopic and have astigmatism (visual distortion). High refractive error, flattened corneal curvature, dislocated lenses, early-onset cataracts, glaucoma, retinal detachment, and strabismus (crossed eyes) are also common.

"The clinic with Dr. McDonald provides 'one-stop shopping' for these families," Young explains. "They see two specialists on the same day, and together we jointly decide on

a plan of action for the patient. They also meet with a genetics counselor."

That genetics counselor, Azita Sadeghpour, PhD, recently joined the Eye Center staff to partner with Young. She is involved in both clinical and research studies in the Ophthalmic Pediatric Genetics Program and in the myopia studies, although her activities are very similar in both types of studies.

"I help recruit families, obtain histories and medical records, arrange for genetic testing, draw blood or arrange to have it drawn for DNA analysis, and prepare a pedigree of the family," Sadeghpour says. A pedigree is a diagram of family relationships that uses symbols to represent people and lines to represent relationship connections. It provides a great visual aid when Sadeghpour is explaining the inheritance patterns to the families, who usually are not well-versed in genetics. Her counseling is invaluable for parents and patients who need to address eye or other system involvement proactively with medical or surgical interventions, or who may eventually have to make decisions regarding family planning.

Mapping the Course of Eye Diseases

The number and diversity of ongoing genetic studies being undertaken at the Eye Center greatly influenced Young's decision to join its faculty. "One of the factors in my decision to



Azita Sadeghpour, PhD

come to Duke was the opportunity to study complex genetic disorders with world-class scientists as well as have a practice with world-class clinicians," she says. "It's the best of both worlds." Young's lab is physically located in the Center for Human Genetics (CHG), providing her with access to state-of-the-art equipment and the opportunity to collaborate with some of the best and brightest

statistical geneticists, such as CHG director Margaret Pericak-Vance, PhD and assistant professor Yi-Ju Li, PhD.

Furthermore, Young joined a department with already fruitful collaborative studies between the Eye Center and CHG researchers into the genetic bases of age-related macular degeneration (AMD) and glaucoma.

It's difficult to juggle research and clinical commitments, according to Young, but the rewards are great. "I see many families who appreciate the fact that someone is studying their child's eye disorder," Young says. "And we really appreciate the fact that families are willing to participate in genetic studies because they realize that the discoveries may help their children or future generations."



The Singapore Connection

Young first met Seang Mei Saw, MBBS, PhD, head of epidemiology at the Singapore Eye Research Institute of the National University of Singapore, at a professional meeting in Florida two years ago. They both have a long-standing interest in severe myopia and immediately began to discuss collaborating on some genetic studies into the disorder.

Two years later, the partnership continues—and continues to grow stronger. Saw recently came to Duke to write a collaborative grant application with Young to perform gene mapping studies. Young will coordinate and analyze molecular genetic studies using DNA samples from Singaporean children with myopia.

"Myopia is a rapidly worsening public health problem in Singapore," Saw noted during her visit. "There is certainly a genetic factor that makes certain people and ethnic groups more susceptible to the development of myopia. However, this does not explain the rapid increase in the prevalence of myopia in Singapore over the last three generations."

Surveys have indicated that myopia afflicts 25 percent of seven-year-olds, 33 percent of nine-year-olds, 50 percent of 12-year-olds, and more than 80 percent of 18-year-old males in Singapore. Saw adds that three major ethnic groups reside in Singapore—Chinese, Indians, and Malaysians—and that the Chinese population experiences the highest rate of myopia.

Saw has spearheaded a longitudinal study of 2,000 children in Singapore who were ages five to seven when they entered the study.

Her team found that children who read more than two books a week were three times more likely to develop myopia than those who read fewer books. They also found that children with the same reading patterns were ten times more likely to develop myopia if both parents suffered from it.

There's a treasure trove of environmental, medical, and ophthalmologic data on these students who are now adolescents—and a dream population for genetic researchers like Young. Young and Saw are currently working on grant proposals to study the inheritance patterns in these students' families.

"From a basic science standpoint, we know that whatever is happening with these students is biological," Young says. "The genetic information gained can hopefully lead us to understand why myopia develops and possibly lead to treatment and prevention strategies."

"The message for parents is not to limit the time children spend reading, but to be more vigilant with eye testing, particularly if there is a family history of myopia," Saw says. The Singapore Health Promotion Board also initiated a campaign a few years ago with the slogan, "Fight myopia. Give your eyes a break" to promote the need for frequent eye breaks when studying or performing other near-work activities.

Saw notes that the school system in Singapore has become very competitive, and parents often enroll their children in after-school tutoring sessions to ensure that they do well on the standardized tests, which determine their educational fate as teenagers.

"We've found that children spend inordinate amounts of time doing homework," she says. "Along with taking frequent breaks while studying, we recommend that they spend more time outdoors and less time on the computer. We are also doing studies to find out whether poor lighting is contributing to the epidemic of myopia." (Another old wives' tale may prove to be true!)

Saw is looking forward to returning Young's hospitality when Young travels to Singapore to chair a session on the genetics of myopia at the 11th International Myopia Conference in August. The National University of Singapore (NUS), where Saw has a faculty position, is also the home of the new Duke-NUS Graduate Medical School. The medical school will matriculate its first class of 25 students in August 2007.



Everything you wanted to know about your eyes...

New book by Duke Eye Center faculty explains all aspects of eye health, disease, and treatment—in language patients can understand.



For years Duke Eye Center's specialists wished there was a comprehensive, easy-to-understand reference book to which they could refer patients and their families for more information on a wide range of eye conditions. General health care books and scientific textbooks for eye care professionals were plentiful. A small number of pamphlets existed that doctors could give to patients with more common eye conditions, as well as a couple of books for the lay public that were written by eye institutions. But there was a need for a reference book specifically written and illustrated for the average person and covering all aspects of eye health.

Finally, Eye Center specialists wrote the book themselves. *All About Your Eyes: A Practical Guide in Plain English from the Physicians at the Duke University Eye Center* is now available at most fine bookstores or online at retailers including Amazon.com. The illustrated guide provides practical information and answers the questions that Duke's eye doctors commonly hear from patients.

"We came up with the idea for this book when we realized that our eye patients needed a reliable, easy-to-understand guide to eye care," Sharon Fekrat, MD, FACS, and Jennifer S. Weizer, MD, explain in the book's introduction. "Often in the eye doctor's office, the eye seems like a mysterious organ, and the unfamiliar words used to describe the eye and eye disease can be difficult to understand. We have designed this reference text as a guide to the eyes and how they work, what can go wrong with them, and what to do about it."

Fekrat, an associate professor of ophthalmology on the Eye Center's Retina Service, began working on the book in 2002 and

immediately enlisted the help of Weizer, who was then an ophthalmology resident and later a glaucoma fellow at Duke. (Weizer recently joined the faculty at the University of Michigan.) The two put together an outline of topics, then enlisted the help of Duke Eye Center colleagues in each specialty who eagerly agreed to write the chapters in their own areas of expertise. More than 30 Duke eye specialists contributed to the book. Fekrat and Weizer then edited all of the chapters to ensure that the writing style was consistent and easy to read for the average eye patient, the family, or anyone wanting to know more about the eye.

The book begins with an explanation of the anatomy of the eye and how it works, preventive eye care, common vision problems, and options for correcting vision. Then, in separate chapters on the cornea, retina, optic nerve, eye muscles, and other topics, Duke specialists explain a wide range of diseases and conditions. To help readers easily find what they need, the book addresses each eye condition in a standard format with sections defining the condition, describing what the patient may experience, what the doctor looks for, what the patient can do to treat the condition, when to call the doctor, the usual treatments, and the prognosis, specifically answering the patient's all-important question, "Will I see better?" A glossary defines technical terms. The book is printed in a slightly larger type size than most books for enhanced readability.

"We are very pleased with how the book turned out," says Weizer. "It's very accessible with wonderful illustrations. We hope people will find it to be an easy-to-read, trusted guide for those who want to know more about the eye."

All About Your Eyes is hot off the presses. With the latest information and links to Web sites such as the National Eye Institute and the American Academy of Ophthalmology, the authors anticipate that the content will remain up-to-date for several years. The book may be updated periodically as new treatments become available.

Fekrat and Weizer have received enthusiastic responses from their eye care colleagues around the country, an indication that this book fills an important niche in helping eye patients understand their conditions. Ophthalmologists in countries as far away as India have already approached them about the possibility of translating this book into other languages.

The authors hope that many ophthalmologists will refer their patients to this new resource and will keep a copy in their waiting rooms for people to look through. And while it is not, of course, a substitute for seeing an eye doctor, the book can help readers better direct themselves to an appropriate specialist.

"This has been an exciting opportunity for all of us at Duke Eye Center to help fill a void in the type of trusted information that our own patients—and eye patients throughout the world—have needed and have asked for," says Fekrat, who particularly enjoys the chapter on the anatomy of the eye, recalling that it was pictures of the eye's structure that first drew her to the field. "We are so pleased with how the book turned out, and we think that when people take a look at it, they'll find it hard to put down!"

(Much) **Less is** (Much, Much) **More**

Revolutionary new corneal transplant surgery, replacing only the back of the cornea, requires no sutures—for much faster recovery and better results

The biggest advance in corneal transplant surgery in more than two decades is revolutionizing the field of corneal transplants and making this surgery much more beneficial for patients.

It's a case where less is more—much, much more.

While traditional corneal transplant surgery requires the surgeon to remove and to replace 100 percent of the patient's cornea, this new technique allows them to remove and to replace just 2 percent of the cornea—resulting in quicker healing, fewer complications, and faster vision recovery.

The new procedure is Descemet's Stripping Endothelial Keratoplasty or DSEK ("DEE-seck") for short. In DSEK, the surgeon removes and replaces only the very *back* layer of the cornea, entering the eye through a tiny incision that makes it possible to complete the procedure without the sutures that are a mainstay of traditional transplants.

DSEK is appropriate for people who need a corneal transplant due to corneal swelling or damage at the back of the cornea. Patients with inherited Fuchs' dystrophy, a previous cornea injury, or a failed transplant may be eligible. (DSEK is not for people with damage or disease in the front part of the cornea, such as keratoconus.) Of the 35,000 corneal transplantations performed in the United States each year, about two-thirds are candidates for DSEK.

Surgeons on Duke University Eye Center's Cornea and Refractive Surgery Service have been on the leading edge of this technique, which was developed by two surgeons in private practice. Since last summer, the Duke team has performed more than 60 DSEK surgeries, and the doctors say within two to three

years, virtually all posterior transplants performed at Duke will be done with DSEK. The cornea faculty members are sharing their expertise and research results with cornea surgeons around the country at national ophthalmology conferences.

"This is the single biggest advance that I've been involved with in my career," says Alan Carlson, MD, associate professor of ophthalmology, "beyond anything I've seen in refractive surgery, from RK to PRK to LASIK. More has happened in the last year with regard to corneal transplantation surgery than the previous quarter-century. This is a very exciting time to be in this field."

The Old Way

In traditional corneal transplant surgery, which has remained largely the same for several decades, the procedure involves actually cutting through and around the entire cornea to remove a thick, circular plug containing all four layers of the cornea, then replacing it with a full-thickness, donated cornea from an eye bank. The new cornea is then sutured into place with about 16 stitches, going 360 degrees around. Those sutures generally remain in place for six months to a year and must be monitored closely for irritation or infection. Recovery time for a traditional transplant is about a year, and, even then full visual recovery may not be achieved. And because corneal transplant incisions never fully heal, there is always a risk that an injury will damage the transplant.

The DSEK Way

Descemet's Membrane is a thin, circular layer of sensitive cells located at the back of the cornea on its endothelial layer, accounting for about 2 percent of the corneal tissue. As the name implies, in Descemet's



Alan Carlson, MD



Terry Kim, MD

Stripping Endothelial Keratoplasty, the surgeon strips out and removes Descemet's Membrane and replaces just that membrane with a new, healthier one from a donated human cornea.

The surgery begins with topical or regional anesthesia via an eye drop rather than the injection used in traditional surgery. A tiny incision of just 3.5 to 5 millimeters is made at the top or side of the eyeball. Using specially designed instruments including several that have been developed by Duke faculty, the surgeon delicately peels off the old Descemet's Membrane and pulls it out through the incision. Then the membrane from a donated cornea is folded over and inserted through the incision. The circular membrane unfurls itself, with a small air bubble beneath it. The air bubble causes the endothelial cells to create a vacuum that keeps the new tissue adhered to the recipient cornea, and the bond gets stronger over time. Because of the vacuum, no sutures are required to keep the new membrane in place. Surgeons do put in one suture to close the tiny incision, but this single suture is removed within a month—far sooner than when the 16 sutures are required in the traditional surgery.

"Before, we had to transplant the whole cornea, when the problem was only in that back portion," says Terry Kim, MD, associate professor of ophthalmology. "Now, we can just remove that back layer and replace it with new donor tissue without having to deal with side effects. It's an amazing step forward."

Advantages of DSEK

DSEK offers tremendous advantages for patients, say Carlson and Kim who, along with Natalie Afshari, MD, and Terry Semchyshyn, MD, are conducting ongoing studies and developing new surgical instruments and techniques to improve patient outcomes and to make it easier for other surgeons to learn DSEK.

Without sutures, the risk of infection, inflammation, or rejection is much less, and the eye heals much faster than after the old form of surgery. By one month, the eye generally heals to a point comparable to two years out of traditional surgery. Vision also recovers much more rapidly; six weeks after DSEK, vision is comparable to eight months after a traditional transplant. Astigmatism, a common side effect of traditional surgery, is also drastically reduced, as is dryness, and patients who have had both types of surgery report that DSEK is much more comfortable and appealing. And because there is no large incision, a future injury is less likely to damage the transplant.

Follow-up after DSEK is also much easier. There is no need to monitor and remove multiple sutures and less need for steroids or other medications. One of the few precautions is that for a few days after surgery, patients must be careful not to rub their eyes to avoid dislodging the new tissue while it heals.

Because it requires much less specialized follow-up care, DSEK is the first corneal transplant operation suitable to take into Third World countries. During the next 18 months, Duke's Cornea Service plans to travel to several developing countries to perform DSEK and to train local practitioners to provide follow-up care.



Paul Lee, MD, JD

Treating Glaucoma Early Lowers Economic Burden

Early diagnosis and treatment of glaucoma may significantly reduce the economic burden for people with the disease and on the U.S. health care system, according to a new study by Paul Lee, MD, JD, at the Duke University Eye Center and other researchers. Their findings appeared in the January 2006 issue of *Archives of Ophthalmology*.

Glaucoma is a leading cause of blindness in the United States, affecting an estimated 2.2 million adults, the researchers say. Experts anticipate the overall number of people living with glaucoma to rise as the number of elderly Americans increases. Glaucoma damages the cells and fibers of the optic nerve, interrupting visual signals to the brain. The disease is believed to be caused by abnormally high pressure within the eye. Additional causes may exist, however, because those with glaucoma can have normal intraocular pressure. Late diagnosis of glaucoma is common because the patient experiences virtually no symptoms, making it detectable only with an eye exam.

The researchers found that patients diagnosed and treated early or when glaucoma was merely suspected spent approximately \$623 per year on health care, while those patients with advanced disease spent approximately \$2,511. The cost of medication was responsible for one-third to one-half of these costs.

"It is imperative that patients with glaucoma be closely-monitored for changes in their disease," says Lee, a glaucoma specialist at Duke University Eye Center and lead author of the study. "Our results prove what we've thought for a long time—that the disease gets more expensive as it worsens. With effective treatments at earlier stages, the progression of disease can be slowed or halted, saving both the patient and society from greater economic burden."

To determine whether glaucoma patients' healthcare costs rose as their disease progressed, the researchers began by analyzing 151 randomly selected records of adult patients (average age was 66.3 years) in different stages of primary open-angle or normal-tension glaucoma, as well as records of patients only suspected of having either

glaucoma or ocular hypertension. Then they grouped the records according to how far the disease had progressed in each patient. For each stage of progression, the researchers determined how much the patients had spent on doctors' visits, diagnostic testing, treatment, rehabilitation services, and medicine.

The cost of medications as determined in the study was based on wholesale prices. The researchers point out that since patients typically pay retail prices, actual medication costs may be higher. How consistently patients use their medications may also affect costs.

"We know that for chronic diseases such as glaucoma, people don't use their medications as frequently as recommended by their physician," says Lee. "We took this into account in our study, but we suspect that the true costs of medication use could be even greater than we found."

The researchers also found that glaucoma treatment became more aggressive with worsening of the disease, except for those patients with end-stage glaucoma. This variance is because there are few traditional treatments for those who have gone blind due to their glaucoma, says Lee. When the costs of additional care for low vision and vision rehabilitation services are added, however, costs per year for patients blind from glaucoma are even higher.

Because the study analyzed patients who had been followed for at least five years, many of the patients were initially seen and treated 10 or so years ago. "Since that time, additional treatments have become available," Lee adds. "However, these medications are fairly expensive."

"Ultimately, increased medication costs and changes in patterns of treatment may cost patients and society more to care for patients than they do now on an annual basis. However, when managed correctly and effectively, glaucoma patients can retain more of their vision and therefore remain more productive with a presumably higher quality of life."



Parag Gandhi, MD

Cosmetic and Reconstructive Oculoplastic Specialist in Winston-Salem

In September Parag Gandhi, MD, will join the Duke University Eye Center of Winston-Salem to provide full-time, specialized care for patients requiring consultation in aesthetic/cosmetic or functional ophthalmic plastic and reconstructive surgery related to the face, eyes, and eyelids.

Gandhi, who joins the Duke University faculty as assistant consulting professor of ophthalmology, will offer facial aesthetic services such as BOTOX injections, dermal fillers like Restylane, and CO2 laser skin resurfacing of the face and eyelids. He also will perform functional tear duct surgery and reconstructive surgery after injury or disease, such as orbital surgery to repair fractures or to remove tumors near and around the eye, and he will treat inflammatory conditions such as thyroid eye disease. He will perform all of these procedures at the Winston-Salem practice or a nearby surgery center, offering a convenient site for patients to receive specialized, expert oculoplastic care without leaving Winston-Salem.

In addition to caring for patients, Gandhi will spend time each month teaching Duke residents and fellows at the Durham Veterans Affairs Medical Center as well as lecturing at the Duke Eye Center's main campus location in Durham.

"Joining the Duke Eye Center of Winston-Salem is a great opportunity because it will give me the chance to build an oculoplastics service and to establish myself in a community where this practice has been very successful," he says. "I am also excited to be associated with such

a well-regarded faculty and academic medical center."

For Gandhi, who was born in India and grew up in western Canada and northern New Jersey, the appeal of a career in medicine hit during his sophomore year at Columbia University. After hands-on experiences working in a research laboratory at St. Luke's Hospital and at Columbia's College of Physicians and Surgeons, he found himself drawn to the basic sciences and human physiology.

When he did his first ophthalmology rotation, during his third year of medical school at Mount Sinai, Gandhi notes, "There was the 'wow' factor of looking inside the eye under magnification, and realizing that here is a window to systemic disease and understanding what is happening inside the body. That really got me hooked."

Toward the end of medical school, he took an elective in oculoplastic surgery and, upon graduating from medical school, he spent a year in Honolulu for a medical internship. There he spent two weeks working with an oculoplastic surgeon. "Those two experiences helped me understand that there is a lot of variety in oculoplastics. The field is very procedure-oriented, and every patient is different from the next. I knew it would be a challenging and rewarding field that I could stay interested in for the rest of my career."

Gandhi returned to Mount Sinai for his residency in ophthalmology. In 2004 he began a two-year fellowship in oculofacial plastic surgery, sponsored by the American Society of Ophthalmic Plastic and Reconstructive Surgery, at the University of Tennessee and Vanderbilt University. He and his family, his wife, Raina, and their two-year-old daughter, will move from Nashville to Winston-Salem this summer.

An athlete who enjoys a wide range of sports, Gandhi played tennis in high school and rowed for the crew team in college. In medical school, he took up running and completed the New York City Marathon in 1996. During his internship in Hawaii, he pursued his passion for scuba diving. Gandhi's free time is spent mostly with his family. But when time allows, he enjoys travel, photography, tennis, and running.

"Dr. Gandhi is a skilled surgeon who trained at a top oculoplastics fellowship program," says Julie Woodward, MD, chief of Duke's Oculoplastics Service. "His patients will appreciate his delightful bedside manner. We are very enthusiastic about his arrival at Duke."

(Note: Gandhi will replace Justin Johnsen, MD, who leaves the Winston-Salem office in June to live closer to his parents and his wife Laura's family in Utah.)



“What’s in a face?” It’s an age-old question. But the more interesting question may be “What’s *under* a face?” Bones are the scaffolding that support all of the soft tissues creating the face’s surface. Duke’s newest oculoplastic surgeon, Michael Richard, MD, who joins the faculty in July as a clinical assistant professor, may be on the brink of discovering how this “scaffolding” shifts as a person ages.

Conventional wisdom has been that the human skull stops changing once it reaches full maturity around age eighteen. Richard, along with Julie Woodward, MD, Duke’s head of Oculoplastic and Reconstructive Surgery Service, believes that the human skull continues to change as it ages.

“These changes,” says Richard, “manifest mainly in the bones around the eye socket. The forehead comes forward while the cheekbones and the walls of the eye sockets move backward. This movement can cause eyelid tissues to become malpositioned, which creates functional as well as cosmetic problems.”

Richard and Woodward are gathering evidence to support their theory. “We are looking at CT scans taken of patient populations of various age groups, and we are seeing considerable changes and differences between the groups – some even between males and females,” he says. In the next months, Richard believes results of their research will support a significant shift in current thinking. “If we are correct, this could mean many different approaches would become available for treating issues that arise from the aging face—including surgical correction and possibly even prevention.”

Currently, he and Woodward are also researching new treatment modalities for blepharospasm. “Blepharospasm is a terribly disabling disease in which patients experience constant uncontrolled spasms of the muscles of the face and eyelids. This constant blinking causes the patient to become

functionally blinded,” he explains. “Current treatments are aimed at blocking these spasms by injecting BOTOX to paralyze these muscles or by performing surgery to remove some of the muscles. Unfortunately, patients invariably require multiple injections every three months for the rest of their lives.”

Recent advances in the understanding of the disease process have illuminated some of the brain processes that cause these spasms. Richard, Woodward, and Donald Woodward, MD, a neurophysiologist in Winston-Salem, are conducting a study to better define patients’ responses to treatment. “The ultimate goal is to collaborate with the neurosurgery department here at Duke to attempt to treat the disease with a single surgery and obviate the need for lifelong injections,” says Richard.

Richard will see patients at the Eye Center’s main campus location on Erwin Road and at the Duke Eye Center of Cary, offering cosmetic, functional, and reconstructive procedures involving the face, eyelids, tear ducts, and eye sockets. Common cosmetic procedures include blepharoplasties of the upper and lower eyelids, BOTOX and Restylane injections, and brow lifts. He will also perform common functional procedures, including correcting drooping or malpositioned eyelids, correcting excessive tearing, and treating orbital tumors. Richard’s practice will also include reconstructive procedures such as repairing the eyelids after the removal of a skin cancer or after trauma.

“Dr. Richard is an outstanding physician and an excellent surgeon,” says

Julie Woodward, MD. “He has a wonderful bedside manner. We welcome him to the Duke family with great enthusiasm.”

Richard grew up in Rhode Island, attended Stanford University as an undergraduate, and returned to New England for medical school at Boston University. He completed both his internship and residency at UNC-Chapel Hill before coming to Duke in 2005 for a clinical and research fellowship.

Those who know Richard may think they are seeing double after July, when his identical twin brother comes to Duke to join the orthopaedic surgery department. He admits he and his brother switched places once. “We tried it once in school in foreign language class, and it didn’t turn out so well. I don’t think we’ll try that again.”

Away from the clinic, Richard likes to swim and play tennis with his wife, who is a graduate of the Duke University Fuqua School of Business and is an executive at GlaxoSmithKline.

Michael Richard, MD

Cosmetic and Reconstructive
Oculoplastic Specialist





Molly Walsh, MD, MPH

Glaucoma Specialist

By the time Molly Walsh, MD, MPH, completed medical school, an internship in general surgery, a residency and a master's in public health, she realized that she wanted to learn more about medical research and how to translate research to patient care. After training at Tulane and the University of Virginia, she and her family moved to Durham where she is completing a glaucoma fellowship. She joins the Eye Center faculty in July as an assistant professor of ophthalmology and will participate in a clinician-researcher program funded by a three-year Institutional Mentored Clinical Scientist Development Award (K12 Grant) from the National Eye Institute (NEI) and the National Institutes of Health (NIH).

Duke Service Chief for Glaucoma Rand Allingham, MD, says he is pleased to have Walsh join the Duke Glaucoma Service faculty. "Dr. Walsh will be joining us in her role as a clinician-scientist funded by the K12 Program. This program supports the development of young clinician-scientists in translational medicine, designed to move new and powerful research to the patient's bedside," he says. "Dr. Walsh has been a very active researcher during her fellowship; she has a very bright career ahead of her."

Basic research conducted in laboratory isolation is often difficult to implement in a clinical setting. The grant allows vision scientists and patient-oriented clinical investigators to conduct research related to all aspects of vision and then bring that research directly to patients in a clinical setting.

The grant will allow Walsh to spend 75 percent of her time doing research and taking classes. At other times, she will see patients at the main campus Eye Center and at the North Durham Office on North Duke Street. The third year of Walsh's grant time will be devoted solely to research and to the publication of her findings.

Walsh is passionate about her research, which will be primarily focused on immunology, specifically, inflammation related to glaucoma. Currently, she is exploring a new approach to the treatment of glaucoma. "Most current treatments for glaucoma are aimed at the front of the eye," explains Walsh. "This research could shift the focus to the rear of the eye, where the optic nerve and retina are located."

She and her fellow researchers will tag macrophages that originate in bone marrow. "In rodent models with induced glaucoma, we will evaluate the presence and activity of the macrophages in the optic nerve and retina, where they may contribute to inflammation," continues Walsh. "Therefore, this may actually contribute to the disease process itself." Better understanding of this process may lead to treatments, and possibly prevention, by manipulating the paths of the immune system.

"I really enjoy the learning process, and I am looking forward to returning to the classroom," offers Walsh. "I love the academic side of my work as much as working with my patients."

A long-time New Orleans resident, Walsh says she enjoys living in North Carolina. "My husband and I miss the music in New Orleans, but we enjoy all of the outdoor activities available in North Carolina and look forward to exploring the state."

Natalie Afshari, MD, Cornea and Refractive Surgery Service, and her collaborators have published eight scientific papers during the past year. The papers are about LASIK, refractive surgery, corneal transplantation, keratoconus, Fuchs' corneal dystrophy, and floppy iris syndrome. At the 2006 meeting of the American Society of Cataract and Refractive Surgery, she moderated a scientific session on LASIK, and served as a judge of the scientific posters. In April Afshari was promoted to associate professor of ophthalmology.



Rand Allingham, MD, Glaucoma Service, and the Duke glaucoma genetics research team announced a major finding at the Association of Research in Vision and Ophthalmology (ARVO) in Ft. Lauderdale in May. A study, funded by a major philanthropist, showed that there appears to be major glaucoma genes primarily found in either Caucasian families or families of African descent. Although other genes are found in both groups, this important finding may explain why people of African descent are more likely to develop glaucoma than those of other races or ethnic groups. This discovery has particular relevance for research currently being conducted in Ghana, a West African nation, where studies of glaucoma genes are underway. The Duke glaucoma team includes Allingham, glaucoma faculty Pratap Challa, MD, Leon Herndon, MD, and Michael Hauser, PhD, and Margaret Pericak-Vance, PhD, at the Duke Center for Human Genetics. Finding the genes that



cause glaucoma will assist doctors to diagnose glaucoma and to develop entirely new approaches to the treatment of this prevalent disease. Allingham's research is also funded by the National Eye Institute of NIH, private foundations, and other individual donors.

Sanjay Asrani, MD, Glaucoma Service, spoke at the annual meeting of the American Academy of Ophthalmology, the Korean Ophthalmic Society meeting, the Chinese University of Hong Kong, and was the keynote speaker at the Glaucoma Top-Ten biennial meeting in Buenos Aires. Asrani and his colleagues have developed a new drainage implant for glaucoma patients and are completing the testing phase. Using a recently developed video and high-resolution optical coherence tomography system, he is pursuing research on early glaucoma diagnosis in adults and children. He was recently selected as one of the Leading Health Professionals of the World 2006.



Vadim Arshavsky, PhD, Research, received a Senior Scientific Investigator Award from Research to Prevent Blindness. He published two papers, "Arrestin Translocation Is Induced at a Critical Threshold of Visual Signaling and Is Superstoichiometric to Bleached Rhodopsin" in the *Journal of Neuroscience* and "The N-terminus of GTPγS-activated Transducin α-subunit Interacts with the C-terminus of the cGMP Phosphodiesterase g-Subunit" in the *Journal of Biological Chemistry*.



Catherine Bowes Rickman, PhD, Research, received a three-year, \$300,000 grant from the Ruth and Milton Steinbach Fund and a three-year, \$294,900 grant from the Foundation Fighting Blindness for age-related macular degeneration studies.



Edward Buckley, MD, Pediatric and Strabismus Service, was the featured speaker at the annual South American Strabismus meeting (CLADE) in Santiago, where he spoke on innovations in strabismus surgery. In December he was the keynote speaker at the College of Ophthalmologists of Hong Kong and the Hong Kong Ophthalmological Society's annual scientific meeting in China. This spring he traveled to Singapore, where he is assisting in the development of a Western-style medical school, to talk about medical education. He is currently the vice-chairman of the American Board of Ophthalmology and president-elect of the American Association of Pediatric Ophthalmologists.



Alan Carlson, MD,

Cornea and Refractive Surgery, recently designed two surgical instruments to be used in the new suture-less corneal transplant technique DSEK. His surgical outcomes data for this new procedure were presented at the March meeting of the American Society of Cataract and Refractive Surgery (ASCRS) in San Francisco. At that same meeting, a video presentation of this surgical technique was coauthored by second-year resident Carrie Morris, MD, and second-year fellow Starck Johnson, MD. Carlson and second-year resident Adam Easterling, MD, are studying safer methods of combining corneal transplantation in patients who have previously undergone glaucoma filtration surgery. He and cornea fellow Sean Pieramici, MD, are studying Nd-YAG capsulotomy rates following the insertion of new multifocal intraocular lenses such as the ReSTOR, and Carlson is also studying the surgical benefits of the new 60Hz Intralase femtosecond laser for LASIK and corneal lamellar surgery.

**Pratap Challa, MD,**

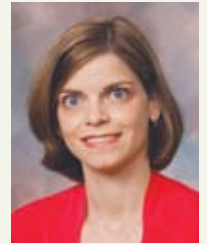
Glaucoma Service, was recently named to Best Doctors in America. He and colleagues from the Durham Veterans Affairs Hospital published an economic analysis of using a teleophthalmology system to detect diabetic retinopathy. Challa and Eye Center faculty Leon Herndon, MD, Rand Allingham, MD, Paul Lee, MD, JD, and Sanjay Asrani, MD, also published a paper evaluating the outcomes of selective laser trabeculoplasty.

**Scott Cousins, MD,**

director, Duke Center for Macular Diseases, Vitreoretinal Diseases and Surgery Service, was coauthor (first author) along with Eye Center colleague Ivan Suñer, MD, and researchers at Bascom Palmer Eye Institute, of an article about the effects of cigarette smoking and tar on dry AMD, which was published in *Investigative Ophthalmology & Visual Science*. He also coauthored "Retinal Pigment Epithelium Protection from Oxidant-mediated loss of MMP-2 activation Requires both MMP-14 and TIMP-2" in the same publication. In March he presented a community seminar on AMD to more than 300 individuals.

**Laura Enyedi, MD,**

Pediatric and Strabismus Service, along with colleagues Sharon Freedman, MD, Cynthia Toth, MD, and Sandra Holgado, MD, coauthored an article titled "Extraocular Muscle Surgery for Extorsion after Macular Translocation Surgery: New Surgical Technique and Clinical Management," which was published in the January 2006 issue of *Ophthalmology*. Enyedi recently lectured on "Amblyopia Treatment Update" at the Duke Educational Series in Cary. Enyedi also was author of the strabismus chapter in *All about Your Eyes*, a reference book written by Eye Center faculty.

**David Epstein, MD,**

chairman of ophthalmology, delivered the 34th Annual Bruce Fralick Lecture at the University of Michigan Glaucoma Spring Conference Program in Ann Arbor, and was the Residents' Day graduation speaker at the University of Pittsburgh in June.

**Sharon Fekrat, MD,**

Vitreoretinal Diseases and Surgery Service, was inducted as a fellow of the American College of Surgeons last fall. Fekrat and Robert Shuler, MD, coauthored an editorial published in the *American Journal of Ophthalmology* in January 2006, titled "Does Radial Optic Neurotomy Alter Blood Flow in Eyes with Central Retinal Vein Occlusion?" In February she presented "Targeting Choroidal Neovascularization for Macular





Degeneration” at the NCSEPS Clinical Update, and in April Fekrat spoke at the 15th Annual Duke Advanced Vitreous Surgery Course in Durham. In May she was an invited speaker at the 2006 Retinal Physician Symposium, presenting “Intravitreal Triamcinolone for Diabetic Macular Edema and Retinal Vein Occlusion” and “Diagnostic Workup for Vascular Occlusive Disease.” Fekrat and Robert See, MD, coauthored a chapter on retinal vein occlusion in the recently published book *Optical Coherence Tomography in Retinal Diseases*.

Paulo Ferreira, PhD, Research, published an article “Interaction of Nephrocystin-4 and RRGRI1 is Disrupted by Nephronophthisis or Leber Congenital Amaurosis-Associated Mutations” in *Research Proceedings of the National Academy of Sciences, USA*.



Sharon Freedman, MD, Pediatric and Strabismus Service, coauthored a paper recently accepted for publication in the *American Journal of Ophthalmology* titled “Central Corneal Thickness in Children: Stability Over Time” (coauthors include first author and current Duke glaucoma fellow Kelly Muir, MD, as well as colleagues Laura



Enyedi, MD, and Sandra Stinnett, DrPh). She was an invited speaker at both the pre-Academy Glaucoma and Pediatric Ophthalmology symposia held in Chicago in October 2005, and also organized and directed the symposium of AAPOS at the American Academy of Ophthalmology meeting. Freedman and co-authors Sandra Holgado, MD, Laura Enyedi, MD, and Cynthia Toth, MD, authored a paper titled “Extraocular Muscle Surgery for Exotropion after Macular Translocation Surgery: New Surgical Technique and Clinical Management,” which was published in the January 2006 issue of *Ophthalmology*.

Leon Herndon, MD, Glaucoma Service, was the guest lecturer for grand rounds at Stanford University in January. He was an invited speaker at the Society for Excellence in Eye Care meeting in St. Thomas in February and the International Health in Eye Care Conference at Yale in April. In March he attended the American Glaucoma Society meeting in Charleston as a member of the executive committee. Herndon recently participated in a second ophthalmology mission to the Dominican Republic, where he was presented the Dedicated Humanitarian Service award by the office of the president of the Dominican Republic.



Glenn Jaffe, MD, Vitreoretinal Diseases and Surgery Service, presented at the Mid-Winter American Uveitis Society meeting in Vail, Colorado. As visiting professor at the University of Michigan in February, he lectured on intraocular drug delivery to faculty, trainees, and outside visiting guests and spoke to the residents on a variety of vitreoretinal topics. He also



was program chairman at the Macula Society meeting in San Diego in February. Jaffe was lead author of an article titled “Fluocinolone Acetonide Implant (Retisert) for Non-infectious Posterior Uveitis: 34-week Results of a Multi-center Randomized Clinical Trial,” which was recently accepted for publication in *Ophthalmology*. The paper describes the nine-month results of this study, one of the pivotal trials that led to FDA approval for the Retisert implant in April 2005.

Terry Kim, MD, Cornea and Refractive Surgery Service, was honored with the American Academy of Ophthalmology Achievement Award at the 2005 Annual Meeting in October. As part of the ASCRS Corneal Clinical Committee, Kim was coauthor of a white paper published in the *Journal of Cataract and Refractive Surgery* on the “Management of Infectious Keratitis Following LASIK.” Former trainees David Yeh, MD, and Matt Bushley, MD, collaborated with Kim on a paper describing the use of Fibrin adhesive for epithelial ingrowth that was published in the *American Journal of Ophthalmology*. Kim spoke at the Royal Hawaiian Eye Meeting, the World Ophthalmology Congress in Brazil, and the Bascom Palmer Eye Institute. He also served as visiting professor at the University of Alabama and the Medical College of Georgia. Kim served on the planning committee for the ASCRS Cornea Day and coauthored several abstracts at the meeting.



Gordon Klintworth, MD, PhD,

Research, participated in meetings of the Pan American-Zimmerman Ophthalmic Pathology Society and the World Congress of Ophthalmology in Sao Paulo in February 2006. At the World Congress he delivered papers on fungal uveitis and corneal dystrophies, and he cochaired a symposium on corneal pathology and refractive surgery. While in Brazil he also attended a meeting of the International Committee for the Classification of Corneal Dystrophies. At the World Congress of Ophthalmology, the International Society for Ophthalmic Pathology, which Klintworth founded in 1987, was admitted to full membership in the Federation of International Ophthalmological Societies. He presented “Historical Aspects of Yellow—the Color Associated with Cowardice” at the Schnyder Lecture at the Cogan Ophthalmic History Society in Hershey, Pennsylvania in April.



Paul Lee, MD, JD,

Glaucoma Service, along with team members from the Department of Community and Family Medicine, presented two papers on improving the quality of diabetic eye care at the 2005 American Medical Informatics Association meeting, and both were among the top papers. He was appointed to the board of Prevent Blindness America in January. As part of a NEI-funded study, Lee consulted in Geneva with the World Health Organization on preventing diabetes-related blindness. He



and a colleague from the Duke Law School presented a paper on million-dollar malpractice awards at a malpractice symposium at Vanderbilt University. Lee is chairman of the subcommittee of the American Glaucoma Society’s Patient Care Improvement Project, which is looking at ways to overcome the barriers to effective glaucoma treatment.

Brooks McCuen, MD,

vice chairman, ophthalmology, Vitreoretinal Diseases and Surgery Service, was keynote speaker at the 6th Annual Retinal Fellows’ Forum in Chicago in late January. In April he participated in the Duke Advanced Vitreous Surgery Course in Durham and the Scar Wars Symposium at the 2006 ARVO Annual Meeting in Ft. Lauderdale. He received the Retina Research Foundation’s Gertrude D. Pyon Award, and he will give the Pyon Lecture at the American Society of Retina Specialists Meeting in Cannes, France in September.



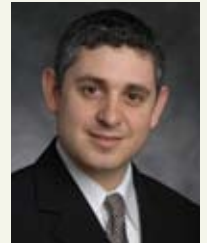
Phillip McKinley, MD, MPH,

Comprehensive Service, received a masters in public health from UNC-Chapel Hill. He has been appointed to the Board of World Mission’s board on AIDS Care, which is an organization of the Moravian Church.



Frank Moya, MD,

Glaucoma Service, lectured on the use of Ocular Coherence Tomography in glaucoma at the Ophthalmic Photographers’ Society meeting in Chicago. He contributed comments for an article on the clinical use of OCT for glaucoma in the AAO’s November/December *Eyenet Magazine*. Moya was a featured glaucoma expert on Winston-Salem radio station WSJS during “Medical Monday” segments in December and January. He gave a seminar on the new ReSTOR lens that corrects both distance and near vision.



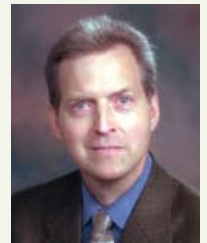
Prithvi Mruthyunjaya, MD,

Vitreoretinal Diseases and Surgery Service, gave presentations at the Retina Society meeting and at the International Congress of Oncology in the fall. He coauthored with Sharon Fekrat, MD, a chapter in the text book *Ryan’s Retina*.



Dennis Rickman, PhD,

Research, authored two recently published articles, “Expression of the GABA Plasma Membrane Transporter-1 in Monkey and Human Retina” in *Investigative Ophthalmology & Visual Science* and “A2 Amacrine Cells in the Distal Inner Nuclear Layer of the Mouse Retina” in the *Journal of Comparative Neurology*. His nonprofit organization SCIfEYES, along with *Saturday Night Live* personality Will Forte, announced the establishment of a \$10,000 scholarship for a Duke medical student to study stem cell research.





Eric Postel, MD, Vitreoretinal Diseases and Surgery Service, along with colleagues from the Duke Center for Human Genetics and the Vanderbilt University Medical Center, published “Gene Variant, Smoking Combine to Increase Macular Degeneration Risk” in both the online edition and print version of the *American Journal of Human Genetics*. He and other researchers have pending a publication on further analysis of genotype-phenotype relationships in AMD. Postel served as the director of the 2006 Advanced Vitreoretinal Surgery Course, which featured Duke vitreoretinal faculty and an international guest faculty. As director of Perioperative Services, he directed operating room renovations totaling more than \$5 million at the Eye Center and is to oversee PACU renovations, which are expected to be completed in Fall 2006. He is working with Paul Lee, MD, JD, on a NIH-funded study evaluating the delivery of ophthalmic care to patients with diabetes.



Ivan Suárez, MD,

Vitreoretinal Diseases and Surgery Service, was elected president of the Association of Veterans Affairs Ophthalmologists and will take office in October 2006. He was coauthor along with Scott Cousins, MD, and researchers at Bascom Palmer Eye Institute of an article about the effects of cigarette smoking and tar on dry AMD, which was published in *Investigative Ophthalmology & Visual Science*. Suárez also authored an article on AMD published in the *Federal Practitioner* and an article in *Ophthalmology Times* on a new device for ultra-wide-field angiography that will help with early diagnosis and treatment of diabetic retinopathy.



David Wallace, MD, MPH,

Pediatric and Strabismus Service, received the American Academy of Ophthalmology Achievement Award at the fall meeting in October. He also was named to the Governor’s Commission on Early Childhood Vision Care. In May he received a MPH degree from UNC-Chapel Hill.



Julie Woodward, MD,

Oculoplastic and Reconstructive Surgery, was inducted as a fellow into the American Society of Oculoplastic and Reconstructive Surgery, completing the written and oral exams in November.



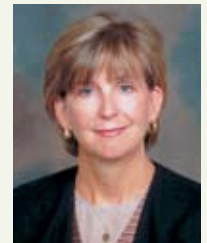
Terri Young, MD,

Pediatric and Strabismus Service, coauthored “Two Novel TP63 Mutations Associated with the Ankyloblepharon, Ectodermal Defects, and Cleft Lip and Palate Syndrome: A Skin Fragility Phenotype,” which was published in *Archives of Dermatology* 2005, as well as “Differential Gene Expression in Mouse Sclera During Ocular Development,” published in *Investigative Ophthalmology & Visual Science*. Young spoke at the North Carolina Eye Physicians and Surgeons Winter CME event in February and presented “How the Human Genome Project Has Changed Ophthalmology.” She was keynote speaker at the Myopia and Visual Science Academy Conference and the Vision Science Journal Forum held in March in Wenzhou, China. She is a 2005–2007 member of the National Eye Institute, NIH, Vision AED Study Section and a 2005 member of the Search Committee for the NEI Ophthalmic Genetics Branch Chief.



Carol Ziel, MD,

Glaucoma Service, contributed several chapters in *All About Your Eyes*, a reference book authored by Duke Eye Center physicians. She presented her research regarding cataract surgery for the treatment of angle-closure glaucoma at the spring 2006 ASCRS meeting along with resident John Berdahl, MD. Ziel spoke at the spring McKinley Conference about this surgery and her experience with the new multifocal ReSTOR implant for cataract surgery.





FERRELL RECEIVES PRESIDENTIAL AWARD

Long-time Duke Eye Center employee Irma Ferrell was recently named a recipient of the 2006 Presidential Award, a prestigious honor bestowed on Duke employees who have made distinctive contributions to their profession. Only four individuals are honored each year.

Ferrell, a surgical technician, has been a Duke Eye Center employee since 1973. She worked in the Duke South operating room from 1969 to 1973.

"The nomination was such a surprise. I feel so honored and very grateful to receive such an award," she says.

Ferrell might appear nonchalant as she goes about the Eye Center's surgery center in her no-nonsense scrubs, but she really leads a double life of sorts. She's also well-known around the Eye Center as the singing member of The Complications, a band organized by Eye Center alumni and other medical staff. The band performs several times a year at Eye Center functions, recently entertaining at the Eye Center's AVS conference dinner.

Duke President Richard Brodhead presented each of the four Presidential Award recipients with a Presidential Medallion and a check for \$1,000 at a luncheon in April. He also presented a certificate along with a check for \$100 to each of the 20 Meritorious Service Award recipients.

"She has always been a valuable resource for the entire surgical team," says Priscilla Ramseur, clinical operation director, Perioperative Services. "Not only is she a valuable resource for the Duke Eye Center OR team, she is typically contacted by graduates of the Duke Eye Center fellowship and residency programs as they begin their practice across the country."

"When you ask the team how they would describe Irma, the response would be 'very knowledgeable, expert, dedicated, efficient, remarkable, outstanding, resourceful, dependable, flexible, problem solver, extraordinary, and a wonderful singer,'" says Ramseur.

Each year, four staff members from Duke University and the health system are selected for their outstanding job performance within the past calendar year. Recipients for one Presidential Award and five Meritorious Service Awards are selected from each clerical/office support, clinical/professional non-managerial, service/maintenance, and managerial areas.

Award recipients also receive invitations to attend the Founders' Convocation (Fall 2006) and to serve on the selection committee for the next nomination period.

HERNDON RECOGNIZED FOR WORK IN DOMINICAN REPUBLIC

Leon Herndon, MD, glaucoma specialist and medical director at the Eye Center, was presented the Dedicated Humanitarian Service Award by the office of the president of the Dominican Republic in January. He was recognized for the leadership role he played in organizing an ophthalmology screening that was sponsored by the office of the First Lady of the Dominican Republic, Lions Club International, and the Presidential Commission on Millennium Development in 2005. More than 6,500 individuals were screened and/or treated by 150 volunteers and physicians. In January of this year, Herndon, along with other volunteers, returned to the Dominican Republic to perform needed surgeries.

MORSE RECEIVES STRENGTH, HOPE AND CARING AWARD

Deborah Morse, FNP, Perioperative Services, received a Strength, Hope, and Caring Award for March in the clinical staff category. Kevin Sowers, Duke Hospital chief operating officer, presented the award in March.



The awards program recognizes a clinical staff member, a non-clinical staff member, a physician, and a team who consistently demonstrate "going above and beyond." The Duke University Hospital Human Resources Advisory Committee, composed of Duke employees, selects the winners.

AWARDS & RECOGNITION

ARSHAVSKY RECEIVES SENIOR SCIENTIFIC INVESTIGATOR AWARD FROM RPB

Vadim Arshavsky, PhD, a professor of ophthalmology and neurobiology at the Duke University School of Medicine, has been granted a \$65,000 Senior Scientific Investigator Award by Research to Prevent Blindness (RPB). These awards support nationally recognized senior scientists conducting eye research at medical institutions in the United States. Arshavsky is one of 141 scientists at institutions so honored since the award was established in 1987.

He will explore a novel hypothesis that photoreceptor cells exposed to continuous light are protected from light-induced damage in part because there is a massive protein translocation between the major cellular compartments. When constantly exposed to light, protein translocation may serve to optimize the protein complement of the light-sensitive part of the cell to reduce excessive signaling. "We believe that these studies are directly relevant to identification of future strategies ameliorating visual loss from neurodegenerative diseases," says Arshavsky.

RPB is the world's leading voluntary organization supporting eye research. Since it was founded in 1960, RPB has channeled hundreds of millions of dollars to medical institutions for research into the causes, treatment, and prevention of blinding eye diseases.



MCCUEN NAMED PYON AWARD RECIPIENT

Brooks McCuen, MD, vice chairman, ophthalmology, and service chief, Vitreoretinal Diseases and Surgery Service, has been named recipient of the Retina Research Foundation's Gertrude D. Pyon Award. He will receive the award and will deliver the Pyon Lecture at the American Society of Retina Specialists Meeting in Cannes, France in September 2006.

The Pyon Award was created by the Retina Research Foundation of Houston to recognize outstanding vision scientists whose work contributes to knowledge about vitreoretinal disease. McCuen will receive a \$5,000 personal honorarium and a \$15,000 research award. The award is endowed by an estate gift from Gertrude D. Pyon of San Antonio.



AMD PUBLICATION IS NAMED MOST-CITED RESEARCH ARTICLE



The Duke team: 1st row: Mike Hauser, PhD, Margaret Pericak-Vance, PhD, Eric Postel, MD. 2nd row: Sarah Chen, Maureen Shaw, Silke Schmidt, PhD, Bill Scott, PhD, Jennifer Caldwell, Daniel Kao, Paul Gallins

Duke researchers, along with colleagues at Vanderbilt University Medical School, were recognized by Essential Science Indicators SM for having the most-cited research publication in the multidisciplinary field. Their article "Complement Factor H (CFH). Variant Increases the Risk of Age-related Macular Degeneration" was published in *Science* in April 2005. ESI Special Topics spotlights publications that deal with current and emerging trends in specialized areas of research. The Eye Center's Eric Postel, MD, was coauthor of the article.

Gene Variant, Smoking Combine to Increase Macular Degeneration Risk

Duke Eye Center researcher Eric Postel, MD, along with colleagues at the Duke Center for Human Genetics and Vanderbilt University Medical Center, has discovered an interaction between cigarette smoking and a gene identified as LOC387715 that could account for as many as one-third of all cases of age-related macular degeneration (AMD).

In smokers who carry the genetic variant, the risk of developing AMD is increased about eight-fold when compared to that of non-smokers without the variant. The actual function of the gene in the visual system is currently unknown. Further analysis showed that in non-smokers, the genetic variant confers a two-fold increase in AMD risk.

“The most exciting aspect of this research is that it is the combination of the gene and smoking that really puts you at risk,” says Margaret Pericak-Vance, PhD, director of the Duke Center for Human Genetics and senior author of the report. “We demonstrate, for the first time, that a gene variant coupled with a modifiable lifestyle factor, such as cigarette smoking, confers a significantly higher risk of AMD than either factor alone.”

The study, conducted in 1,001 individuals with all forms of AMD and 394 unrelated healthy controls, evaluated 185 variations in the DNA sequences of genes found in a particular region of the genome that other genetic studies have implicated in susceptibility to AMD.

Researchers learned that 42 percent of the chromosomes of individuals with AMD, compared to only 26 percent of chromosomes in the control group, showed a specific sequence variant of the gene statistically associated with the highest risk of developing the disease.

“You cannot change your genetics,” says study coauthor Eric Postel, MD, associate professor of ophthalmology, “but there are things you can do to reduce your risk. You can change your diet, take vitamins, and stop smoking.”

Considered to be one of the first confirmed links between genetics and environment, the study's results were first published in the March 6 online edition of the *American Journal of Human Genetics* and then in the May issue of the journal. The research project was funded by the National Eye Institute of the National Institutes of Health.

The new study also elucidates the discovery of the second major susceptibility gene for AMD. A previous study by this group and others identified the first major genetic risk factor for the disease—a gene called complement factor H (CFH). CFH is believed to play a role in the regulation of the immune system. The joint effect of the two variants and smoking may be responsible for up to 61 percent of all cases of AMD, according to the researchers.

New Research Faculty

Paloma Liton, PhD, who joins the Duke faculty as an assistant research professor the first of July, doesn't recall exactly when she became interested in research, but she does remember pondering whether to take virology or genetics while in middle school at her home in Madrid, Spain.

"I guess the idea of doing research was always there, and I focused all my subsequent steps toward this goal,"

Liton says. Her first contact with research was while taking virology and studying the mechanisms by which the measles virus evades the immune system. Ultimately, she completed a master's degree in biological sciences (molecular biology and biochemistry) and a PhD in molecular biology at the Universidad Autónoma de Madrid (UAM), Spain.

By the time Liton had written her dissertation, "Immune Evasion Strategies by Measles Virus," and had finished her PhD, she knew she wanted to study abroad. "Again, this idea of traveling abroad was always there. I took the logical steps, going where the resources were, the USA, and expanding my knowledge and career options," she says.

She accepted a postdoctoral position at Duke University Eye Center to work in glaucoma research with David Epstein, MD, and Pedro Gonzalez, PhD. Already familiar with glaucoma research through friends in her former lab, she says the position was an excellent opportunity to apply her background and training in molecular biology to more clinically oriented research, where she could "obtain not just that personal gratification and ego nourishment that research gives, but also to know that what one does makes sense and has a clear objective. Patients in the clinics remind me of my objective every day," she says.



The transition has been easy. "I have had the opportunity of working with terrific mentors. I couldn't have done this without the support of Dr. Gonzalez and Dr. Epstein," she says.

In the glaucoma lab, Liton's research focuses on a small tissue located in the front of the eye called the outflow pathway. Composed of the trabecular meshwork and the Schlemm's canal, this tissue maintains normal levels of intraocular pressure (IOP) by modulating the drainage of the aqueous humor. The malfunction of this tissue leads to elevated pressure, increasing the risk of developing glaucoma.

"I am aware of the complexity of these age-related diseases in terms of finding effective treatments. I just hope that my work here may contribute to the understanding of ocular hypertension, and in some way be useful for the development of new therapy approaches," says Liton.

"Paloma is the type of highly motivated and enthusiastic young scientist that is so much needed to ensure the continuing progress in the field of glaucoma research," says Gonzalez. "With her energy and novel ideas, she brings to the department an extensive technical knowledge and a mature understanding of the challenges and responsibilities associated with biomedical research," he says. "Paloma will be an invaluable asset for the department."

When Liton isn't in the lab, she loves to be outdoors—trying to train her beloved TJ "to become a civilized dog," she says. But research is never far from her mind. A self-described computer addict, Liton is designing a personal trabecular meshwork Web site.

"The TM site will be the must-be-seen place for all glaucoma researchers," she says. Liton hopes to have the site up by the end of the year.

New Research Faculty

Her love for research started when she was assigned to study cell signaling in an unlikely pair of horseshoe crab eyes. But once Goldis Malek, PhD, who joined the Duke University Eye Center faculty in June as an assistant research professor, “got her feet wet” in that two-year project as an undergraduate at the University of South Florida, there was no turning back.



“While I was an undergraduate, I began volunteering in a protein chemistry laboratory,” she says. “I had a great mentor whose philosophy was to always design experiments that give results that answer a question but also give rise to many more.”

The mentor’s philosophy inspired Malek’s work with the horseshoe crab eyes and piqued her interest in research. In 1995 Malek graduated with a bachelor’s degree in psychology and biology from the University of South Florida. She then worked in the laboratory of Christine Curcio, PhD, in the Department of Vision Science at the University of Alabama at Birmingham.

For her thesis work, Malek investigated the role of cholesterol and lipoproteins in dry age-related macular degeneration (AMD). Her hypothesis was that AMD and atherosclerosis share molecules and mechanisms related to extracellular lipid accumulation. Her research focused on the role of cholesterol and its carriers, specifically apolipoproteins in the early, or dry, form of AMD. Her hypothesis was confirmed.

Since 2002 she has been a postdoctoral fellow in the laboratory of Catherine Bowes Rickman, PhD, at the Eye Center, working with the characterization and analysis of eyes from a murine model of AMD.

“The chance to study and characterize an animal model of age-related macular degeneration was extremely exciting to me and expedited my transition into joining Dr. Bowes Rickman’s lab at the Eye Center. There, we had the opportunity to collaborate with Dr. Patrick Sullivan, who had developed human apolipoprotein E isoform-specific targeted replacement mouse lines,” she says.

“I was thrilled when Goldis agreed to join my lab to do her postdoctoral training,” says Bowes Rickman, assistant professor of ophthalmology and cell biology. “Her training with Dr. Curcio, who is one of the world’s authorities in this area, was ideal for studies of our new mouse model of AMD. In spite of my high expectations for Goldis, I continue to be impressed with her. She has been instrumental in establishing our model as one of the premiere models of AMD through her meticulous efforts, ability to ask hypothesis-driven questions about the results, to design the ‘right’ next experiment, and to collaborate. Goldis is an excellent new addition to our faculty who has and will continue to make big contributions to understanding macular degeneration.”

Her current research explores retinal pigment epithelium (RPE) degeneration and drusen formation in the aging and diseased retina. She is using mouse models (in vivo), cell culture lines (in vitro), and genetic resources.

When Malek isn’t in the lab, she enjoys activities such as hiking and camping. “When I get the chance, which isn’t often recently, I like to fly planes and scuba dive.”

Philippines Research Trip

A Duke Eye Center research team led by Rand Allingham, MD, glaucoma service chief, recently completed a field trip to Luzon, the main island of the Philippines. The team's primary goal was to determine the prevalence of eye disease and blindness among older members of the Aeta, a hunting-gathering population who are genetically distinct from the rest of the Filipino population, and who have poor access to health care, including eye care. It is widely believed that the Aeta are the original inhabitants of the Philippines, having arrived more than 20,000 years ago via land bridges that linked to Asia's mainland.

The Aeta, a population with an average height of 4 ft. 6 in., had lived in the vicinity of Mount Pinatubo until thousands were killed or displaced when the mountain erupted in 1991. The researchers' secondary goal was to determine the effects caused by living closer to more developed areas.



Cecilia Santiago, MD, project coordinator, and Rand Allingham, MD, pose with patients at the St. James Parish Church, where the screenings took place. In appreciation for the team's efforts, members of the community brought gifts of food.

Allingham, Cecilia Santiago, MD, whose family lives on the island, along with Filipino ophthalmologists Edith Navarro, Paul and Karen Francia, JJ Eclarinal, and Benjie Dizon performed eye screenings for more than 230 individuals. Anna Stout, PhD, an associate clinical professor emerita at Duke, and wife of Allingham, performed height, weight, and blood pressure assessments. The Duke-Filipino team was able to determine the common causes of vision loss, cataracts, and eye trauma, as well as dispense reading glasses to assist in day-to-day activities.

Of great interest to the research team was finding that glaucoma appeared to be uncommon in this population. The team failed to identify a single advanced case of the common types of glaucoma in the Aeta population.

"These findings warrant future investigation as to why this may be the case," says Allingham. He notes that if the finding is confirmed, it would be of great value to look for protective genes for glaucoma in this and other similar populations.

THE DUKE DEPARTMENT OF OPHTHALMOLOGY
presents the
EIGHTEENTH ANNUAL

GLAUCOMA SYMPOSIUM

CURRENT CONCEPTS AND TECHNOLOGIES

Saturday, September 16, 2006

The William and Ida Friday Center • Chapel Hill, NC

<p>Keynote Speakers Alan Robin, M.D. Associate Professor, Department of Ophthalmology <i>Johns Hopkins University & University of Maryland</i> Baltimore, Maryland</p>	<p>Course Director: Leon W. Herndon, Jr., M.D. Associate Professor of Ophthalmology Medical Director <i>Duke University Eye Center</i></p>
<p>Chris Johnson, Ph.D. Director of Diagnostic Research and Senior Scientist, <i>Discoveries in Sight Devers Eye Institute</i> Portland, Oregon</p>	<p>For more information: Renee W. Wallace Continuing Education Coordinator Duke University Eye Center 919-684-6593 walla023@mc.duke.edu</p>

Carolyn Vaughan Retires

Working behind the scenes, she made sure daily life at the Duke Eye Center ran like clockwork. As manager of clinic services at the main Eye Center on campus and three Triangle satellites, her job impacted many—from patient to doctor to clinical staff. She has seen the Eye Center faculty grow from five doctors to more than 50.

Carolyn Vaughan retired from the Eye Center on May 31, after an ophthalmology career that began in 1973.

A co-worker announced that she was leaving to become nurse manager at the then-new Eye Center and asked Vaughan if she was interested in changing careers from respiratory therapy to ophthalmology.

“I loved it from minute one! I could not study or learn enough,” Vaughan says.

The transition was natural. “I had always been in some field of medicine, taking care of patients as an LPN and as a respiratory therapy technician,” she says. Vaughan became one of the first certified ophthalmic technicians (COT) at Duke in 1979.

For nine years, Vaughan worked for the Eye Center’s neuro-ophthalmologists. Then, she and ophthalmologist Charles Sydnor, MD, left Duke to join Paul Abernathy, MD, a former Eye Center resident, to establish the Alamance Eye Center. Vaughan says it was Sydnor’s belief in her abilities as a leader that gave her the confidence to do what needed to be done.

“I trained 14 assistants to the COT level, assisted in the planning and building of the Alamance Eye Center, and managed the medical side of the practice for the next 10 years,” she says.

Four years later, following a stay in New Mexico, Vaughan interviewed for a part-time COT position in the Comprehensive Service at the Eye Center. Ultimately, that post led to Vaughan’s becoming manager of clinical services.

She quickly found new mentors at the Eye Center. Vaughan has fond memories of the physicians and administrators she worked with over the years.



“When I needed advice or just wanted to vent, I would go talk to Charles Mansfield, the Eye Center administrator, who was also my manager,” she says. “He always listened and gave me great advice.”

She says Paul Lee, MD, JD, the Eye Center’s first medical director, and David Epstein, MD, chairman, were very supportive. “Dr. Lee became my ‘go-to’ person after he accepted that position.”

“Dr. Epstein also encouraged me to make the Eye Center a better place for technicians and nurses to work so we could develop a highly trained, competent staff who would give support to the physicians and the best care to our patients.

“Brett Moran has also been a very supportive manager. He has always understood the importance of balancing work and family and has encouraged me to work with employees to help them balance their lives. I have enjoyed working with Brett planning satellite clinics and then seeing them grow and prosper.”

Moran, the associate administrative director at the Eye Center, has been her manager since his arrival at the Eye Center in the late-90s. “I could not have asked for a more knowledgeable and compassionate leader to partner with to achieve great successes over the years,” says Moran. “I will really miss her wisdom and companionship in managing the operation of our clinics, and I wish her much happiness in her retirement.”

Vaughan has seen many advances in ophthalmology during her tenure. “When I first began at the Eye Center in 1973, cataract patients were hospitalized in bed for days and not allowed to do anything for themselves. They wore very thick prescribed glasses after six weeks and had not-so-great vision. Now cataract patients are here a few hours, go home, and see well the next day even after having had an intraocular lens implant.

“The Eye Center’s growth has been incredible and the surgeries, lasers, and medications now available are helping to save sight every day. What could be more wonderful? What profession could be more exciting to work in than helping someone to see?”

Vaughan’s retirement should bring its own excitement. Her immediate plans are to head to the beach for some rest and relaxation. Later, she plans to volunteer, read, travel, and spend more time with her family.

In from the Storm

It was a storm of misfortune for many in Hurricane Katrina's path, but for one former Duke Eye Center researcher, the storm had a boomerang effect.

When Anna Hong, MD, left the research lab of Pratap Challa, MD, last June, she was excited to have finalized her career path. After starting at Duke as an internal medicine resident, Hong discovered that she wanted to be an ophthalmologist. Upon switching specialties, she found a research opportunity

in Challa's research lab. A year later, she was set to begin her first year of ophthalmology residency at Tulane University in New Orleans.

When Hurricane Katrina unleashed its fury on the Louisiana coastline on August 28, her academic career at Tulane came to a standstill. With less than two months of her residency completed, Hong, a native of Fairfax, Virginia, returned home to consider her options.

"Following Katrina, the Tulane Department of Ophthalmology and the Accreditation Council for Graduate Medical Education were working on a plan to set up temporary rotations at other residency programs for the remainder of the year," she says. "I requested to do my rotation at Duke.



"I was accepted by Duke to start clinical rotations and was also offered an interview to join its residency program as an incoming first-year resident," she says. Serendipitously, this was also the time that the Eye Center had recently expanded its program.

Hong was accepted into the 2006 Duke Ophthalmology residency program. With months to wait for the program to begin, she applied for and was accepted for her old position in Challa's lab. "With the support of Dr. David Epstein and Dr. Challa, I was also given the opportunity to pursue research in glaucoma for the rest of the year," she says. Hong returned to the same lab she'd worked in months earlier to continue her research in the differential gene expression of Pseudoexfoliation syndrome, an age-related disorder that causes secondary open-angle glaucoma.

"We are thrilled to have Anna back as part of the Duke family," says Challa. "She is a wonderful person who is both energetic and hard-working. There always seems to be a small silver lining to every tragedy."

She says her long-term career goals are to practice in an academic setting as well as pursue medical missions and research. "I have been most attracted to the visual nature of the field, the integration of medical and surgical therapy, and the opportunity to make dramatic impacts on the quality of life of patients," she says.

Hong earned a bachelor of arts in English and a bachelor of science in biology at Virginia Commonwealth University as part of a combined BS/MD degree in the guaranteed admission medical program to the Medical College of Virginia. She graduated from the University of Virginia School of Medicine in 2003.

Financial Advisor Says Thanks with an Annuity Gift



A patient of Rand Allingham, MD, chief of glaucoma service, for more than 15 years, Margaret Woodhouse largely credits him for improving not only her eyesight, but also her quality of life.

Stricken with both glaucoma and cataracts in the past two decades, Woodhouse's once-fuzzy view of the world is now clear enough for the 94-year-old Durham resident to get around quite well, to live on her own, and even to drive.

To express her gratitude to Allingham and the Duke Eye Center team, she recently established the Margaret Woodhouse Gift Annuity at Duke, a generous life-income gift that pays her an annuity during her lifetime and, upon her passing, will support glaucoma research at the Duke Eye Center.

The gift is even more significant given Woodhouse's professional background. The first female trust officer at Depositors National Bank (now Bank of America), she dispensed financial wisdom to countless others from 1951 to 1972. She not only continues to follow financial news, she also follows the investment advice she shared for more than two decades.

"A life-income gift like mine is a very good way for someone to support a cause they want to support," she says of the income-bearing annuity she established. "It's important to support the causes you believe in, and this is a financially smart way to do that."

Woodhouse knows that if it weren't for eye care research conducted in the past, the advances that have made her vision what it is today would not have been possible.

"I'm happy to give my money to Duke's eye research program because I believe in supporting causes that are important," she says. "The doctors at Duke need funding to carry on their work."

Woodhouse, who still sees Allingham regularly to follow up on her glaucoma surgeries, was impressed with the Eye Center's new Albert Eye Research Institute (AERI) when she attended its dedication.

"It's really a beautiful facility," she says, "it is an honor to support Dr. Allingham's research."

To learn more about gift annuities and other ways you can support Duke Eye Center through planned gifts, visit giftplanning.duke.edu, or contact Joseph W. Tynan, JD, director of planned giving, at 919-667-2506.

Eye Center Dedicates Fifth Operating Room

The Duke University Eye Center dedicated its fifth Operating Room (OR) in November 2005. The addition of the state-of-the-art OR is part of the Eye Center's renovation plan that is designed to accommodate faculty growth and the increased patient volumes at the Eye Center. Since 1990 Eye Center patient visits have doubled with 70,000 visits at Wadsworth (the main campus on Erwin Road) and 30,000 visits at satellites.

With the fifth OR in use, wait time for patients to schedule surgery is minimized, and more patients can be scheduled for surgery. In 2005 the Eye Center added six physicians and continues to add more in 2006. Eye Center administrators expect the number of surgical procedures to increase to more than 6,000 this year, up from 3,900 in 2002. The cost of construction and equipment was approximately \$4 million.

Eye Center Physicians Perform Surgeries in Dominican Republic



From left: Leon Herndon, MD, Adrienne Williams Scott, MD, and Robin Vann, MD.

Duke Eye Center physicians participated in a second ophthalmology screening in the Dominican Republic in January. Leon Herndon, MD, Robin Vann, MD, and Adrienne Williams Scott, MD, performed cataract surgeries for more than 600 men and women who had been identified as needing surgery. The individuals receiving the surgeries are from El Seybo, where the average income is less than one U.S. dollar per day.

The event was sponsored by the office of the First Lady of the Dominican Republic, Lions Club International, and the Presidential Commission on Millennium Development. Their trip was a follow-up to a 2005 screening where more than 6,500 individuals were screened and/or treated by 150 volunteers and physicians.

Olympics Ad Features Eye Center Faculty

An example of the surgeries performed by physicians at the Duke Eye Center was showcased in the "More Precious Than Gold" ad campaign created by the Duke Office of Creative Services and Marketing Communications and aired during the broadcast of the 2006 Winter Olympics in Turin, Italy on NBC.

Cynthia Toth, MD, and her patient Jean Messer, a retired registered nurse from La Crosse, Virginia were featured in one of four spots. Messer began to lose her vision to macular degeneration in 2002. In 2004 she was approved for macular translocation surgery—a procedure performed at only a few hospitals around the nation and pioneered at Duke.

"It was a pure miracle," Messer says. "It totally changed my life. I have my independence back. Now I can do everything. I'm back to playing the piano. And I can read large-print books. I tell everyone about my successful experience at Duke."

She's also back to driving. And on a recent outing to Durham, she even delivered a freshly baked cake to Toth and the rest of the team who made her new life and outlook possible.

Support for Stem Cell Research



From left: Dennis Rickman, PhD, Will Forte, and Sharon Freedman, MD.

News of medical student fellowships usually come from somber, suited presidents of companies or institutions. But on November 28, 2005, Duke University medical students learned of a new \$10,000 research fellowship from someone a bit more like themselves. The fellowship is designed for medical students during the research-oriented third year of study.

Will Forte, a writer, producer, and cast member of NBC's *Saturday Night Live*, faced a friendly audience when he announced to a room of medical students the establishment of a \$10,000 Stem Cell Initiative for Eyes (SCIfEyes) research fellowship in the field of stem cell biology for the 2006-2007 academic year. With a twist of his trademark humor, Forte said "You people are wondering why I am here. Well, it's blind people. It's not that I don't like blind people; I just wish there were fewer of them."

Dennis Rickman, PhD, assistant research professor of ophthalmology and neurobiology at Duke, and founder of SCIfEyes, said, "We like to think that we're working near the cutting edge, but we're barely scratching the surface. The next generation of physicians and scientists will be the ones to make the real breakthroughs and see cell-based therapies for eye diseases become a reality. You are the ones we need to invest in."

Forte is the national spokesperson for SCIfEyes, a Raleigh-based, non-profit organization. SCIfEyes supports research, training, and public education in stem cell biology and works to further the field by recognizing and supporting its potential for creating new therapies for the treatment of blinding and debilitating eye diseases.

Learners Updates

Richard Awdeh, MD, first-year resident, received a "Poster of Interest" recognition at the American Society of Cataract and Refractive Surgery in San Francisco. His presentation detailed the research and outcome analysis using the Verisyse phakic refractive intraocular lens for the treatment of high myopia. Alan Carlson, MD, was the coauthor.

Claxton Baer, MD, retina fellow, received an award and travel grant funding from Bausch & Lomb at the Sixth Annual Retinal Fellows' Forum in Chicago. The award will allow Baer to present "Recurrence of Choroidal Neovascularization after Macular Translocation with 360-degree Retinectomy" at the 24th Annual Meeting of the American Society of Retina Specialists to be held September 2006 in Cannes, France. Cynthia Toth, MD, is senior author of the paper.

Felix Chau, MD, first-year resident, received a "Poster of Interest" recognition for his presentation about the surgical outcome data for DSEK, the new suture-less corneal transplant technique, at the American Society of Cataract and Refractive Surgery in San Francisco. Alan Carlson, MD, was the coauthor.

John DeStafeno, MD, cornea fellow, and Terry Kim, MD, received an honorable mention in the "Best Poster" category for "Effect of Tamsulosin (Flomax) on Iris Smooth Dilator Muscle Anatomy" at the American Society of Cataract and Refractive Surgeons Conference in San Francisco.

Annie Lee, MD, first-year resident, and Alan Carlson, MD, are studying corneal endothelial cell viability with DSEK. Their work was presented at ARVO.

Sherman Reeves, MD, MPH, chief resident and clinical associate, along with faculty members Paul Lee, MD, JD, and Glenn Jaffe, MD, published "Uveitis in the Elderly: Epidemiological Data from the National Long Term Care Medicare Cohort" in *Ophthalmology*.

Molly Walsh, MD, MPH, glaucoma fellow, who joins the glaucoma faculty in July, received the American Glaucoma Society Clinician Scientist Award funded by Merck. The \$40,000 grant supports her K12 research project "Monocyte-Derived Macrophages: Role in Pathophysiology of Glaucoma." Stuart McKinnon, MD, and Scott Cousins, MD, will serve as mentors.

Agre and Stamer Present at Science of Disease Lecture



From left: Peter Agre, MD, David Epstein, MD, and Daniel Stamer, PhD.

The Eye Center welcomed Nobel Laureate Peter Agre, MD, and W. Daniel Stamer, PhD, to the chairman's Science of Disease Lecture May 25, at the AERI Auditorium. Agre, vice chancellor of Science and Technology and professor of cell biology at the Duke University Medical Center spoke on "Aquaporin Water Channels: From Atomic Structure to Clinical Medicine." Stamer, associate head for Vision Science, associate professor in the Departments of Ophthalmology and Vision Science Pharmacology at the University of Arizona, presented "Aquaporins and Aqueous Humor Dynamics."

Approximately 75 faculty and staff attended the lecture and reception.

Visiting Observer

Robert Sanke, MD, FACS, presents David Epstein, MD, chairman of ophthalmology, a commissioned work of art, containing a quote from Sir William Osler about an inquisitive clinician. Sanke, a neuro-ophthalmologist from Minot, ND, arrived at the Eye Center in October as a visiting observer



From left: David Epstein, MD and Robert Sanke, MD, FACS

to learn about the latest methods of glaucoma treatment. With his specialty training, he had done much work with the optic nerve and had a special interest in learning more about glaucoma. During his visit Sanke accompanied faculty members as they saw patients and performed surgery, and he attended education programs such as grand rounds and research seminars. He says he was impressed by the Eye Center's high-quality advanced research and its use of newer diagnostic techniques. In Minot Sanke sees patients at the Williams Clinic at Trinity Medical Center.

Get the latest information!



www.dukeeye.org



Duke University Eye Center
DUKE UNIVERSITY HEALTH SYSTEM

Marketing and Public Relations Office
DUMC 3802 • Durham, NC 27710

www.dukeeye.org

Non-Profit Org.
US POSTAGE
PAID
Durham, NC
Permit No. 60