

# EMORY | eye

## AT THE FOREFRONT OF INNOVATION

NOVEL METHODS OF DRUG DELIVERY FROM EMORY AND GEORGIA TECH





## From the director | Success through teamwork

“Things should be made as simple as possible, but not any simpler.” ~ ALBERT EINSTEIN

### Teamwork made simple. Devices made simple. Sound simple?

**Ophthalmology**—working side by side with engineers. Can this synergy generate new technologies that will help people see? I believe this to be true.

**Ophthalmology**—integrating new drug discovery. Can this synergy generate new opportunities that will improve vision? I believe this to be true.



Over the past two decades, Emory Eye investigators have worked in teams exploring both of these new directions in vision research. The results of this work—as you will see in the following articles—are changing the field of ophthalmology. Some of the newly patented devices are extraordinarily simple—yet not too simple.

The potential for improving sight and the quality of vision is very exciting. Many of the projects reported in this issue have evolved from the labs and are now entering pre-clinical investigation through patience, perseverance and constant iteration. Dr. Edelhauser’s award-winning translational research program is a sterling example of such research. His years of collaborative work have led to a very simple device . . . yet, not too simple.

Of course, we can only reach final success through teamwork. Atlanta is home to one of our nation’s strongest schools of engineering, Georgia Tech. It’s also home to Emory University and Emory Healthcare, an institution that has become one of

our nation’s finest fully integrated academic health care systems. When Georgia Tech and Emory combine,  $1 + 1 = 3$ : the definition of synergy.

At the Emory Eye Center, our clinics are midway through a fundamental redesign. Our restructured clinical space focuses on patient care, enables increased efficiency, and supports education and clinical research. Additionally, we’ve welcomed talented new faculty members who are enthusiastic, well trained, and full of ideas that are re-invigorating our clinical, research, and educational programs.

Our predictive health program is making vigorous new strides as well. Expect an update in our next issue.

In every endeavor—research, clinical care, structural improvements, and new programs and services—all of us at the Emory Eye Center work to improve vision for our patients and to teach our outstanding students. We encourage you to share your feedback about our program. Please send us an email or a note with your ideas and suggestions for opportunities. Oh yes, one last request . . . please keep it simple, but not too simple!

Timothy W. Olsen

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## | EMORY EYE Magazine |

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**Emory Eye Center** *Uncommon knowledge. Uncommon sharing.*

AT THE **BACK OF THE EYE** AND  
AT THE **FRONT OF** **INNOVATION**

**Emory Eye  
Center and  
Georgia Tech**

**break new  
ground on  
biomedical  
technology  
for retinal  
disorders.**

Georgia Tech/Gary Meek



**N** EITHER OF THE EMINENT PHDS  
CAN PIN DOWN THE FIRST TIME  
THEY EXCHANGED DETAILS  
ABOUT WHAT EACH OF THEM  
WAS INVESTIGATING IN THE LAB.

But both of these researchers—the Emory Eye Center’s Henry Edelhauser, former director of research, a multiple-award-winner and an acclaimed expert in drug delivery, and Mark Prausnitz, professor of chemical and biomolecular engineering at the Georgia Institute of Technology—are quick to cite the question that linked their interests: *How can we deliver drugs to the back of the eye more efficiently and effectively?*

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By Ginger Pyron | Cover photo by Jack Kearse

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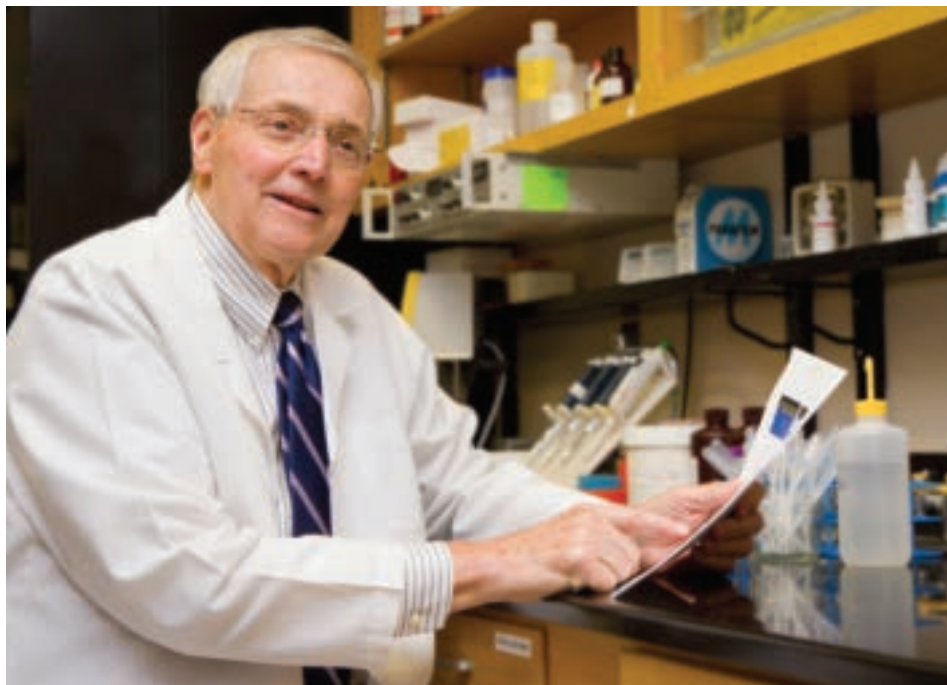


**A key question.** A number of serious conditions can affect the retina (the receptive “screen” at the back of the eye where images are formed), such as age-related macular degeneration, the most common cause of severe vision loss among people over age 60; and diabetes-related disorders, the leading cause of blindness in people under 60. Unfortunately, the retina historically has proven difficult to target directly with newly available drugs.

Traditionally, medications for the eye have been delivered in the form of eye drops. Injections directly into the eye (intravitreal injections) have historically been used for treatment of acute disorders, such as an acute intraocular infection. Intravitreal injections, however, have become a mainstay of clinical management since 2006 for common disorders such as wet age-related macular degeneration and diabetic retinopathy. Alternative methods of delivering drugs to the eye are to simply take a pill, which delivers drug to the entire body, including the eye, or to inject a medication around the eye and allow it to diffuse through the porous white part (sclera) into the target tissues within the eye.

**A big problem.** None of these options, though, selectively targets the retina. Together, Edelhauser and Prausnitz stepped up to meet that challenge. Edelhauser brought to the partnership his years of notable research in drug delivery to the

“... THE MICRONEEDLE IS ABOUT AS LONG AS A REGULAR HYPODERMIC NEEDLE IS WIDE. IT ENABLES US TO REACH NOT JUST THE EYE IN GENERAL, BUT SPECIFIC PLACES IN THE EYE—EXACTLY WHERE THE MEDICATION NEEDS TO BE.”



Henry Edelhauser explains the patent process.

eye, particularly a long-term investigation into a transscleral approach, which he and Timothy Olsen, director of the Emory Eye Center, have shared. Prausnitz, having worked extensively in drug delivery to the skin, had already begun researching the use of very small needles along with his Georgia Tech colleague, Mark Allen, and was interested in ophthalmic drug delivery.

“Joining forces, we looked at the possibility that a microneedle could serve as a targeted delivery conduit in ophthalmology,” Edelhauser says.

**The right moment.** Not only were the two researchers well matched, but, according to Prausnitz, “The timing was lucky. Thanks to advances in the electronics industry, it was no longer difficult to make structures of these micron dimensions.”

For injections in the skin as well as in the eye, physicians use regular hypodermic needles, even when the surface for penetration is very thin. The microneedle’s tiny size—about half a millimeter long (approximately equal to the thick-

ness of a dime)—makes the new implement an ideal alternative.

“For comparison,” Prausnitz says, “the microneedle is about as *long* as a regular hypodermic needle is *wide*. It enables us to reach not just the eye in general, but specific places in the eye—exactly where the medication needs to be.”

**Your tax dollars at work.** Substantial funding for the Emory/Georgia Tech research into the micron-scale needle and related topics appeared in 2006, via a nearly \$7 million, multi-center R-24 grant from the National Eye Institute (NEI), a branch of the National Institutes of Health (NIH). The grant, at that time only the third R-24 awarded by the NEI, was planned to span five years; the project extended into a sixth year. The team’s goals: to find an alternative to direct injections within the eye and to focus on a transscleral approach.

The multidisciplinary collaboration, led by Edelhauser, included additional investigators from the Emory Eye

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## Eye cancer: “We’re trying to simplify things.”

**From his dual perspective as clinician and pathologist, Hans Grossniklaus has functioned as a resource center for the R-24 team, examining tissue to evaluate the success and safety of the technology in its various stages.**

Simultaneously, his own laboratory studied projects that use the microtechnology for the diagnosis and treatment of ocular cancer.

“Seeing eye patients in the clinic and operating room, as well as working in the lab, puts me in a position to develop technology that is clinically applicable,” Grossniklaus says.

“Thinking about some of the technologies in standard use, I said to myself, ‘With the options we have available today, there *must* be a better way.’”

Microneedles are a potentially valuable addition to the field of ophthalmology. Besides targeting medications to the retina via the suprachoroidal space, they may offer an opportunity to substitute for the decades-old technology of placing a radioactive plaque to treat patients with choroidal melanoma. Thanks to microneedles, a drug or even a transient form of radiation may be delivered directly to tumors.

Grossniklaus cites another example: “The latest alternative technology for retinoblastoma, one of most common eye tumors in children, involves intra-arterial chemotherapy, a procedure that’s technically difficult, very expensive, and only relatively successful. Now we are investigating the use of small needles to deliver medications directly to the retinoblastoma. We’re trying to simplify things.”

He notes, too, that unlike more complex techniques that require complicated equipment and procedures, the simple microneedle-based treatments are easily transferable to more remote locations.

Currently microbubbles serve an important function as contrast agents, helping physicians delineate a disease process during imaging such as an MRI or ultrasound. Contrast agents are common in cardiac ultrasound, but so far, Grossniklaus observes, no acoustic contrast agent is being used in combination with ultrasound in ophthalmology.

“The microbubbles offer a secondary benefit, too,” Grossniklaus points out. “The shell of the bubble can deliver a therapeutic agent to the tumor; then the shell can be burst with an ultrasound wave, causing the drug to be released right into the tissue of interest.”

Collaborating with Mark Prausnitz at Georgia Tech, Grossniklaus has launched new investigations using laser-activated nanoparticles to treat retinoblastoma.

Teamwork comes naturally to Grossniklaus, director of Emory’s ocular oncology service (OOS), a group that includes Chris Bergstrom, Baker Hubbard, and

Jill Wells. “We meet regularly, work closely together, and apply a team approach both to clinical care and to research initiatives,” he says.

Grossniklaus expects that the next few years will bring clinical trials for ophthalmic microtechnology, beginning with simple microneedles, followed by microbubbles and then the more complex technology of microparticles.

“For the future,” he envisions, “I see targeted drug delivery with minimal damage to surrounding tissues; ease of delivery and treatment for the patient with minimal discomfort; and ongoing development of new technology in collaboration with biomedical engineers. Compared to what we’ll see in the years ahead, everything we’ve done so far is just scratching the surface.”



Hans Grossniklaus



Mark Prausnitz

Georgia Tech/Gary Weisk

## Tackling advanced macular degeneration

**Timothy Olsen's lab and team collaborate with a coalition of partners, including mechanical engineering professors and graduate students, entrepreneurs, charitable foundations and early-phase startup companies.** Olsen's primary focus is a surgical method that treats advanced end-stage macular degeneration, a condition for which no other treatment options currently exist.

Through the Emory/Georgia Tech joint department of biomedical engineering and with the help of his collaborators—two Georgia Tech mechanical engineers, Shreyes Melkote and David Rosen, and a graduate student, George Mathai—the team is co-developing and testing Olsen's new surgical invention (patent pending): a double ring-shaped device made of the same material as that used for coronary artery stents that can be inserted into the eye through a tiny puncture site. Once inside the eye, the device is used to capture healthy tissue and translocate it into the space directly under the macula, thereby supporting the macula's role as the critical part of the retina, responsible for central vision.

"Biomedical engineering is a growing area for research in our department," Olsen says. "There are fantastic opportunities for innovation in vision research—and the numerous collaborative possibilities here in Atlanta make the Emory-Georgia Tech partnership an excellent setting in which to pursue sight-saving technologies."

Olsen, who oversees an active surgical lab, also holds three patents, collaborates with numerous drug delivery experts, and serves as principal investigator on many separate grants, supported by funding that now totals just over \$5.3 million for translational research.

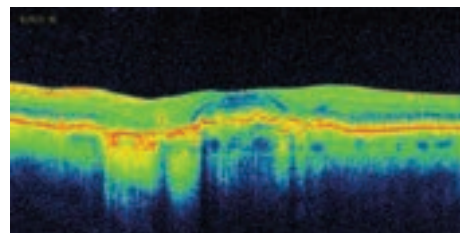
*Funding for Olsen's work in translocation surgery is currently supported by a generous grant from the R. Howard Dobbs Jr. Foundation.*



Center: ophthalmic oncologist/pathologist Hans Grossniklaus, retinal specialist Timothy Olsen, and a team of basic science researchers—Jeff Boatright, Dayle Geroski, and John Nickerson. From farther afield, research professor Uday Kompella, now at the University of Colorado Denver, added his expertise in pharmaceutical science and nanotechnology and ophthalmologist Alan Laties, from the University of Pennsylvania, also joined the group. Early funding from

the Georgia Research Alliance as well as the R-24 grant supported the work of Georgia Tech graduate students and research engineers: Ninghao (Jason) Jiang, Samirkumar Patel and Vladimir Zarnitsyn.

**A literal breakthrough.** The history of medical research abounds with accidental discoveries, including the smallpox vaccine, X-rays, insulin, Pap smears and penicillin. When a lab happenstance occurred for the Emory/Georgia Tech



An OCT (optical coherence tomography) scan of retinal tissue.

team, it changed the course of their research and opened a new channel of hope for patients with retinal diseases.

Originally the investigators were using the hollow microneedles to inject a drug into the sclera of the eye, creating a depot within the sclera from which the drug could seep out later. The protective sclera—whose name comes from Greek roots meaning "hard"—offers a fair amount of resistance to the needle.

"You have to push a bit to get fluid to flow into the sclera," says Prausnitz. "One day in the lab, when Samir Patel was trying to inject a fluid containing easily viewed fluorescent particles into the sclera, the fluid went right in—with no push at all. Samir thought he had missed the targeted sclera. He told Dr. Edelhauser, 'I think I went too far.'"

Patel had indeed gone past the sclera, into an area that the team hadn't expected the short microneedle to reach. The fluid had entered the suprachoroidal space, located between the layers of the sclera and the choroid.

Olsen's research team in Minnesota had just published a novel surgical technique using a flexible cannula in the suprachoroidal space. Remarkably, the innovative microneedle technology suddenly opened a new opportunity—gaining access to this same suprachoroidal space by means of the Georgia Tech

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Opposite left: Mark Prausnitz, professor of chemical and biomolecular engineering at the Georgia Institute of Technology. Right: Henry Edelhauser, former director of research at Emory Eye Center.





WHEN A DRUG IS ENCAPSULATED WITHIN TINY PLASTIC PARTICLES INSERTED INTO THE SUPRACHOROIODAL SPACE, THE BODY DOESN'T REMOVE THEM. INSTEAD, THE PARTICLES STAY UNTIL THEY DISSOLVE.



## Storing eye tissue: One great solution. Still.

**Until 1974, physicians and scientists who wanted to store donated eye tissue—whether for corneal transplant or research—usually put the intact globe into a little jar and refrigerated it for 12 to 24 hours.** Ophthalmology researcher Bernard McCarey changed that system forever.

Once it became possible to isolate the clear corneal tissue for storage, rather than collecting the whole eye, McCarey created quite literally a new solution. Called McCarey-Kaufman Media (acknowledging McCarey's then-chairman, Herbert Kaufman of the University of Florida), the liquid was much like that used for growing tissue cultures in a laboratory, with the addition of a fluid-controlling agent to keep the corneal tissue clear and transparent. MK Media increased tissue storage time up to a week—and revolutionized eye banking.

Thanks to the extended storage time, a prospective transplant patient no longer had to wait in a hotel near the hospital for an eye to become available, but instead could be scheduled for surgery on a specific day. More corneal transplants could take place, too, because the tissues themselves could now be shipped to another location, even another country. And since the decision to donate a piece of tissue, rather than the eye itself, was emotionally easier for next of kin, the number of donations increased dramatically. Throughout the country, eye banks proliferated.

McCarey's technology—the only storage media available for two decades—became standard worldwide. It remains in

widespread use today, along with more recent products by other researchers who slightly modified the original formula.

Though McCarey never patented his innovative solution, he doesn't lose sleep over the fortune he might have made. "It was strictly a research offering to the system of academia," he says. "I like knowing that other people have moved forward with it—that it's still going on."

*Bernard McCarey is a professor of ophthalmology in the basic science research section. His laboratory performs toxicology evaluations on new drugs, contact lenses, and contact lens maintenance solutions, and also serves as a Specular Microscopy Reading Center for two multiple-center surgical clinical trials.*



microneedles and enabling a dramatically less invasive approach. A key piece of the puzzle slid into place.


**Eureka!** "You could call this lab incident a mistake," says Edelhauser, "but it was actually serendipity. We found that the fluorescent particles had spread throughout the suprachoroidal space. Since that space expands when filled with liquid, it makes an ideal pipeline where fluid can move to the back of the eye, toward the macula. The group's data opened up a whole new perspective."

The fluorescent particles also led the group to another key discovery: When a drug is encapsulated within tiny plastic

particles inserted into the suprachoroidal space, the body doesn't remove them. Instead, the particles stay until they dissolve.

Prausnitz recalls, "We realized that we were onto something more exciting than the direction we had originally intended. Our thesis shifted: We were no longer focused on the sclera, but on the suprachoroidal space."

**An open future.** "Our method is non-surgical," says Prausnitz. "Nothing enters that suprachoroidal space except the fluid of the injection itself, which flows along it—so there's no physical object bumping into the choroid."

Edelhauser sums up the far-reaching implications: "We've found the delivery technique, proving that we can aim therapeutic agents directly to the back of the eye. Now the door is wide open for a future of *sustained release*. Pharmaceutical scientists will be able to package drugs in biodegradable nanoparticles or microbeads, tiny carriers that not only can move easily through the microneedle into the suprachoroidal space, but *can stay there*, dispensing the drug gradually over a period of weeks or months. For the patient, this means treatments that are easier, more effective and less frequent." 



## “Two things stood out about vitamin D.”

“I learned that about half the world population is estimated to have low vitamin D levels. And that, on average, patients with darker skin tones and patients who are overweight typically have lower levels of vitamin D.”—John Payne



**While he was a third-year resident at the Emory Eye Center, ophthalmology fellow John Payne began looking into vitamin D, particularly in relation to his patients with diabetes.**

“Two things stood out about vitamin D,” he says. “I learned that about half the world population is estimated to have low vitamin D levels. And that, on average, patients with darker skin tones and patients who are overweight typically have lower levels of vitamin D.”

As many studies have shown, African-American patients have both a higher prevalence of diabetes and a higher incidence of vision-threatening diabetic retinopathy. Payne posed a new question—*Among diabetic patients, do those with the most severe retinopathy have lower vitamin D levels?*—and set out to answer it.

Three months and 225 patients later, thanks to the Eye Center’s grant from Research to Prevent Blindness, Payne examined the results of the study he had conducted with team members at the Eye Center, including retinal specialist Sunil Srivastava, co-fellow Robin Ray in the retina service and Vin Tangpricha, an Emory endocrinologist.

“We were surprised,” he observes, “that while *all* patients with diabetes had lower vitamin D levels than non-diabetic patients did, the *lowest* levels clearly existed in the patients with really advanced diabetic retinopathy.”

From these results arose the next question: *Can maintain-*

*ing sufficient levels of vitamin D help prevent someone from developing diabetic retinopathy and other complications of diabetes?*

Payne has submitted a proposal to a national organization, the Diabetic Retinopathy Clinical Research Network. “Answering this question,” Payne says, “will require a national, multi-center clinical trial. Since sunlight as a source of vitamin D is a big factor in the equation, multiple sites across the United States will be needed to control for location and seasonal bias.”

“My hope is that the results from my study, and from subsequent studies by other groups,” Payne adds, “will provide enough of a reason to proceed with a national trial.”

After graduating this July, Payne will join Palmetto Retina Center in Columbia, S.C. With his love of collaboration, he plans to continue some projects already begun in Atlanta, such as his mentoring of four Georgia Tech students—Aaron

Morris, Ningtao Cheng, Andrew Dicks, and Kyle Tate—who are developing a surgical instrument to help make complicated cataract surgeries both technically easier and safer for the patient.

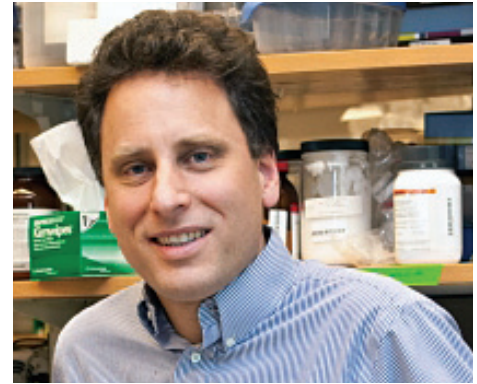
“Emory has been a tremendous opportunity for me, a huge advantage,” Payne says. “We see a lot of diverse pathology at our hospitals, and there’s strong support for research and collaboration. The training program here is second to none.”





## Collaboration that works

*The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University began in 1987 as a research center. In 1995 it launched the joint MD/PhD program, receiving departmental status in 1997 and, in 2001, its current name, honoring a \$25 million gift from the Wallace H. Coulter Foundation. Since 2004, the Coulter Department has attracted over \$90 million in research funding from the National Institutes of Health.*



### **All the elements are in place here.**

The department of biomedical engineering, shared by Emory and Georgia Tech, is the #2 biomedical engineering department in the country, second only to MIT. Emory Eye Center has a very large patient volume and a broad expertise in multiple areas of ophthalmology, which gives us a wide base of knowledge; Georgia Tech has extraordinary expertise in engineering. I'd say that Dr. Edelhauser is the key to why this partnership has worked so well. With his experience and contacts, his amazing overview of academic medicine and business, he's the perfect person to put the whole thing together.

—Hans Grossniklaus, Emory Eye Center

### **Emory's culture fosters innovation and does an outstanding job of recognizing and encouraging people who are undertaking significant new research.**

All the basic sciences are here, from cell biology, physiology, and biochemistry—including complex and innovative biochemistry such as glycomics—all the way to advanced human genetics. We have unique Emory partners in the Winship Cancer Institute, the Yerkes National Primate Research Center, the Rollins School of Public Health and The Carter Center. Also in our Atlanta neighborhood are expert collaborators everywhere you turn: Georgia Tech, the Centers for Disease Control, the Atlanta VA Medical Center and several other community healthcare partnerships. This is a major-league playground for the scientific mind. —Timothy Olsen, director, Emory Eye Center

### **The Georgia Tech/Emory collaboration is a beautiful example of how engineering programs and medical programs can work together.**

It's a credit to the institutional structures that are in place and also to the spirit and attitude of the individual investigators who seek each other out as research partners. Emory's ophthalmology program is a top program, and Dr. Edelhauser is a natural collaborator; he has so much experience and perspective. Bolstering our Georgia Tech expertise with the impressive knowledge and resources of Emory Eye Center has made for a wonderful scientific collaboration. It's a pleasure. —Mark Prausnitz, Georgia Tech



**In four short years, two patents were issued, both a paper and a book were published and a start-up company was created.**

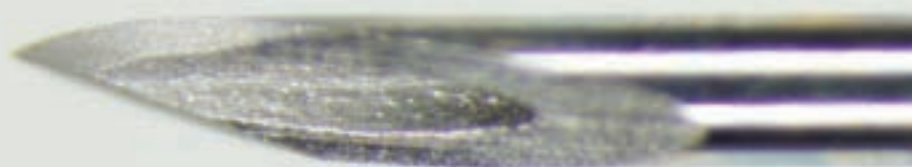


Researcher Samirkumar Patel with an image of retinal cell layers.


Georgia Tech/Gary Meek

## *From the lab ... to the world!*

**Securing the discovery.** The R-24 group applied for a patent on its microneedle apparatus in 2007, and in April 2011, US patent 7,918,814 was granted to Henry Edelhauser, Mark Prausnitz, and Ninghao (Jason) Jiang, the team's first research graduate student. A second patent on suprachoroidal drug delivery to ocular tissues using a microneedle was approved in March. Timothy Olsen's collaboration with mechanical engineering at the University of Minnesota, Emory, and Georgia Tech has led to patents on several ocular technologies that are currently being investigated in translational research.



**Spreading the word.** In a 2011 issue of *Pharmaceutical Research*, the Emory/Georgia Tech team published the results of its investigation. That same year a 590-page textbook appeared: *Drug Product Development for the Back of the Eye* [aapspress/springer], co-edited by Edelhauser and Uday Kompella and presenting a variety of research approaches to drug delivery for the treatment of retinal disorders. Additional Eye Center faculty members contributed chapters, including McCarey, Olsen, and others.

**Providing the product.** The R-24 group's technology for delivering therapeutic agents to specific locations in the eye has generated interest in microinjection product development. On March 8, 2011, a resulting Atlanta-based startup, Clearside Biomedical, received the "Startup Company of 2011" award from Emory's Office of Technology Transfer. Formed with the assistance of Georgia Tech's VentureLab program, the company obtained from Hatteras Venture Partners, based in Research Triangle Park, N.C., a \$4 million venture capital investment to develop drug delivery that targets the back of the eye. Samirkumar Patel and Vladimir Zarnitsyn—both of whom formerly worked with the R-24 team as graduate researchers—joined Clearside's management team. 






*L-R: Lawson & Gayle Calhoun, Mary Ellen Calhoun, and F. Phinzy Calhoun III.*

## Calhoun Oak replanting

The Calhoun Oak, a stately tree gracing the lawn of Emory University Hospital for the past 90 years, succumbed to damage from the ambrosia beetle fall 2011. Unfortunately, the tree could not be saved.

The beautiful oak owed its name to one of Emory Eye Center's founders and early ophthalmology department chair, F. Phinzy Calhoun Sr. In the 1940s his actions saved the tree from being cut down when impending hospital construction threatened it. Calhoun appealed to the board of trustees and hospital officials to save it. In 1964 a bronze plaque was affixed to the tree in commemoration of his admirable gesture.

On a sunny day in February of this year, members of the Calhoun family, Emory officials, Emory Eye Center director Timothy Olsen and guests gathered to plant the "new" Calhoun Oak, a transplant from the front lawn of Clinic B, where the Eye Center is located.

Generations of the Calhoun family shaped the history of Emory Eye Center, and it is fitting that a tree remain on Emory's campus to honor Calhoun's profound contribution to ophthalmology and to Emory. 



## New treatment for eye tumors saves the vision—and the eye.

### **JAMES WILLIS:**

#### **“I’d been just about ready to give up.”**

First there was this little white thing across my eye. I went to a doctor close by, and he took a biopsy off of it and sent it to the lab. About three days later they told me it was an eye tumor. Cancer. That scared me pretty bad, because I remembered a man that I used to work with who got eye cancer, and the doctors he had, they just took his eye out.

My doctor sent me down to Atlanta to Dr. G [Hans Grossniklaus]—that’s what I call him, because his name is hard to say. He’s my buddy. We tried chemo drops in my eye for about six months, and then he and Dr. Wells operated and took out the tumor. That worked fine for about eight or nine months, but then the tumor came back. So Dr. G, he said, “I want to talk to you about shots—in your eyeball,” and I said, “OK, when are we going to start?” He said, “Right now.”

I was scared at first. He gave me



### **MARVIN CROFT (at right):**

#### **“It’s like a miracle.”**

About a year ago, I noticed this little skim over my eye—just around the edges, at first. It was months before anybody could tell me what it was. My sight was really going down. The eye was getting real blurry. And it hadn’t been two years since I had 20/20 vision in both eyes.

Finally, one doctor said I needed to go down to Emory and set me up an appointment with Dr. G. That was November, and Dr. G. and Dr. Wells did surgery on me in December. When Dr. G removed the skim—a kind of cancer—from my eyeball, he couldn’t get the little bit that was attached to the upper lid, so he froze it and then treated it with a drug, interferon. That’s something wonderful they’ve come up with.

Dr. G. told me, “Just a few years ago, about all we could have done was take that eye out.” Then he said, “But I think I can fix it.” Now that’s a smart man.

I got interferon injections for about five weeks and did the interferon eye drops all that time, too. The treatment was exactly like Dr. G said it would be. After you get an injection,

those interferon shots every so often—about five or six shots altogether—and then that tumor was just GONE!

Now I can see better out of that eye than my other one. And it’s not hurting or scratching anymore, either. I told my wife, I believe I need to get some treatment in my other eye now!

The only trouble I had was some side effects from the drug—Dr. G called it “flu in a bottle.” And it’s just like that. It made me cough and feel kind of sick, just like the flu, for a day or two. After that, though, I was all right. That drug really does the trick.

Dr. G. and Dr. Wells—I’d say they’re the A-1 team. I’d take their word for anything, and I’d recommend them to anybody.

The truth is, I’d been just about ready to give up on that eye, but Dr. G. saved it. Going to him was all the difference between night and day. He’s the best.

*James Willis and his wife, Marie, live in Toccoa, Ga.*

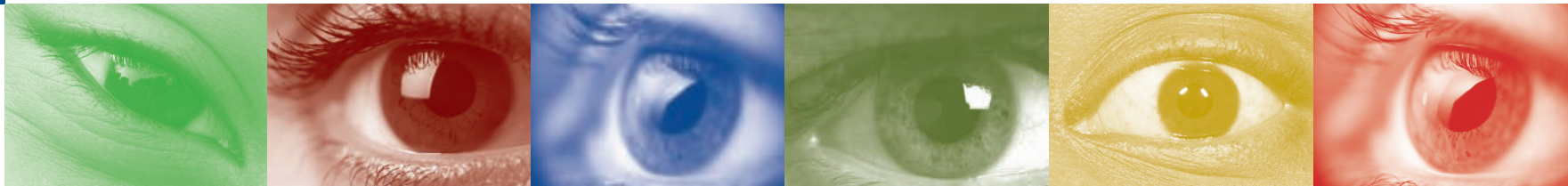
within a few hours you have flu symptoms. On a shot day I’d always take a blanket with me, because by the time my wife and I would get home from Emory, I’d be running a temperature. Those symptoms would last a few days.

Within two weeks, my sight started coming back. I’ll never forget when I went for my last shot. It was my wife’s birthday, and I had my blanket as usual. And Dr. G, he examined me and said, “I can’t see any more of the tumor. You don’t need a shot today after all.” That was the best birthday present my wife ever got.

The cancer’s just not there anymore; the treatment took care of it. It’s like a miracle.

I’d definitely do it again, if I needed it. Those people at Emory did a fine job, and my sight’s not a bit blurry now. When I got to where I could see clearly again, I guess the prettiest sight of all was my wife, Barbara. She’s tickled to death with how this turned out.

*Marvin and Barbara Croft live in Canton, Ga.*



## New visual acuity monitors do double duty

While waiting for your physician in an exam room on our newly renovated third floor, you may notice the new flat-screen visual acuity monitors hanging on the wall. These monitors house state-of-the-art software for measuring vision, but they also provide interesting information about eye disorders while you wait. Called the M & S Smart System, they are popular with patients.

“Our patients can view information about our array of services, our various locations, and offerings they might not have known about, such as cosmetic services,” says Alan Kramer, clinical operations manager. “Our physicians also like the system. They can show surgery candidates a video about their upcoming surgery, a great help in answering many of their questions,” he says.



## Renovations Update



**Our last issue covered the beginnings of our large, third floor clinic space renovation.** Today, we are proud of these beautiful new spaces, which saw a public grand opening in February. Our old, outdated clinic was replaced with a streamlined, fresh design that has helped make the patient and family experience easier. All processes, from check-in to check-out have been studied in detail, including future growth and expansion of either new services, imaging technologies or both. Defined spaces for doctor workrooms, a tech core area, waiting and sub-waiting areas, imaging, and a staff break room have been added.

**Our old, outdated clinic was replaced with a streamlined, fresh design that has helped make the patient and family experience easier.**

The result is a fundamental change from our old third floor clinic, the busiest of all EEC clinics. Services located in the new third floor renovation include retina, comprehensive and contact lens, cornea and oncology.

Our new fifth floor medical offices and clinical trials exam rooms (Phase 1 of that floor) opened in December, welcome additions for many of our staff. In April, the remainder of that fifth floor renovation opened with a colorful new home for pediatric ophthalmology. Parents and their children now have more spacious waiting areas, and exam rooms are specifically tailored to our smallest patients.



## Why safety glasses matter



**Donterious Rowland is one smart kid.** So smart that he's already in the Law & Justice Program at his high school. And so athletically talented that he was tapped "Rookie of the Year" last year, when he was the only ninth grader on his high school's varsity baseball team. He has also been selected for his principal's "Boys Making History" mentoring group, one of just 13 young men to be so honored.

But one small misstep caused this young man to experience something he'll never forget. Donterious had formed a good habit of wearing eye protection while playing sports. Because of his myopia, he requires either glasses or contact lenses to see distance, but for a sport such as baseball, protective safety glasses—made just for his vision requirements—not only provide him the distance vision he needs, they protect the eye and its surrounding bone and tissue from real damage in the event of a ball or bat hitting the eye area.

One night, Donterious forgot his safety glasses. Affectionately called "Peanut" by his team members, they routinely made sure he had his eye wear protection. That one slip, and the crack of his bat on an incoming pitch, caused the ball to deflect and hit him squarely in the eye.

"Donterious is a brave young man," says Scott Lambert, pediatric ophthalmologist. "The damage that he has experienced is not insignificant, but surgery has helped almost all the issues, including the fracture of the bone surrounding the eye and the muscle damage. We will continue to watch him, but his progress is good so far. He's a fortunate young man in this case. Sports injuries, particularly those with a hard object such as a baseball, can cause dramatic injuries," he concludes.

Donterious's accident has his mother, Altvise Brown, on a mission to stress the importance of wearing sports safety glasses and goggles. "He'll never be without them again."

As for Donterious, he says that he's learned "not to swing on an inside pitch and to wear safety glasses every time I play ball. I'll use more protection and bat more carefully," he says, smiling.

Planning to become a college math teacher, Donterious will know a thing or two about mathematical odds from his sports background. And he'll know precisely how to tell students they need protective eye wear. It will come from the heart—and experience.





## Down the road to good vision

**B**efore Robert Waugh came to Emory, he was told “there is nothing more we can do for you.”

But, because of his tenacity, he was able to maintain his livelihood—that of being a long-distance truck driver. He had very nearly lost his job due to declining vision.

Waugh had RK (radial keratotomy) surgery 20 years ago to correct his nearsightedness and astigmatism. During the RK procedure, the surgeon makes tiny cuts into the cornea, thereby flattening the steep cornea and allowing better distance vision.

In the years following his RK, Waugh had developed scarring on his cornea as well as an irregular astigmatism. He underwent multiple additional eye surgeries, but without success. With deteriorating vision in his left eye, he could no longer pass his professional driving exam. He sought help from medical professionals. The last ophthalmologist he saw told him there was nothing more that could be done. That was not what Waugh needed to hear.

He sought out the services of Emory ophthalmologist Sheetal Shah who referred him to contact lens specialist Michael Ward. Ward has fitted specialty contact lenses for difficult cases for more than 25 years at Emory Eye Center. Every day he enables many patients who have suffered from serious eye disorders, abnormalities or trauma to regain their vision—often for the first time in years.

Emory’s specialty contact lens service treats refractive problems such as keratoconus, irregular astigmatism and surgical complications as well as ocular surface diseases such as severe dry eye, Sjogren’s syndrome, Stevens Johnson syndrome and traumas. Ward and colleague Buddy Russell fit patients from the tiniest newborn infants to those in their 90s with specialty contact lenses.



Waugh knew this exam was a last ditch effort, as he says. He had already concluded he might need to change professions since he knew he could not pass the DOT vision test. However, when Ward put a scleral lens on his eye and then tested his visual acuity, it was sharp. “You’ve got to be kidding me!” uttered Waugh. As he says, he was a happy person again. Everyone in the room was thrilled. Ward knew Waugh had to take his vision test very soon, so he put a rush on the lens. Later that week when Waugh underwent the critical test, he happily remarked, “Don’t you have anything harder? This is easy!” He read the 20/20 line.

### **An answer**

For Robert Waugh, a scleral lens was the answer. Ward routinely uses these much-larger-than-normal contact lenses for patients with scarred or painful corneas. The most common use of scleral lenses is for management of corneal ectasias in patients who need, but cannot tolerate, rigid corneal lenses.

Like an architect, Ward custom designs the fit of each scleral lens. He uses a minimum of five curvatures on the back

surface of the lens to precisely fit the shape of the patient’s eye. The sclera lenses do not touch the cornea, rather they vault over the cornea creating a fluid-filled reservoir that bathes the cornea. The periphery of the lens actually rests on the sclera, the white part of the eye.

Scleral lenses were first developed using blown glass in the 1800s. The initial and subsequent designs into the 1900s did not allow necessary oxygen to reach the cornea. Early designs experimented with drilling holes (fenestrations) through the lenses and cutting channels in attempts to bring oxygen to the eye. Only relatively recently have the technologies of 3-D computer lathes and ultra-high oxygen permeable plastics coincided, thus allowing for successful health and optical benefits.

Within the past five years, says Ward, scleral lenses have become more popular, helping more and more people to realize their potential vision. “Modern scleral lenses are a wonderful vision rehabilitation option that often results in truly life-changing events for our patients,” says Ward. “It’s most gratifying.”

Waugh sums it all up when he says, “This is an incredible piece of science.”



## **Perimeter Clinic expands options**

**Our Emory Eye Center clinic located on the north side of Atlanta continues to add specialty clinics.**

In addition to our original refractive surgery offering, Emory Vision, we have added several services to make it convenient for those who live nearby. Cornea, comprehensive, and retina are now offered at the 875 Johnson Ferry Road location. **To make your appointment, please contact our Call Center staff at 404-778-2020.** Parking is in the adjacent lot and free.

### **These Eye Center physicians serve at Perimeter:**

Comprehensive Ophthalmology  
**Xiaoqin Alexa Lu, MD**  
**Ann Van Wie, OD** (Vision & Optical Services)

Cornea, External Disease and Refractive Surgery  
**Bhairavi Kharod Dholakia, MD**  
**Joung (John) Y. Kim, MD**  
**J. Bradley Randleman, MD**  
**Sheetal M. Shah, MD**

Vitreoretinal Surgery & Disease  
**Timothy W. Olsen, MD**  
**Steven Yeh, MD**



## Global Vision Initiative (GVI)

One year later.... opportunities at home and abroad



Chair Timothy Olsen explains disorders of the retina and their global implications.

**Six Eye Center faculty members joined community health strategists and GVI co-directors Susan Lewallen and Paul Courtright on campus in March of this year.** They taught the inaugural vision course offered at Emory's Rollins School of Public Health (RSPH), made possible by Lewallen and Courtright's efforts. "It is the only school of public health course of its kind in this country," says Courtright.

Eye Center faculty already teach "Biology of the Eye," a highly popular offering among undergraduates at Emory. Now, with the RSPH course, "Vision Health: A Global Perspective," the Center's educational outreach broadened to include graduate students. The intense, one-week class, led by Lewallen and Courtright, covered basic eye anatomy, how the eye works, how vision loss varies throughout the world and tropical ophthalmology.

"The purpose of the course is to pro-

vide basic knowledge of the epidemiology of the major causes of vision loss globally, as well as knowledge of what can and is being done to prevent vision loss from these causes," says Lewallen. "The need for a multidisciplinary approach was emphasized, and the treatment of vision loss in less developed communities makes a good model for treatment of other public health problems, especially non-communicable diseases."

Along with Lewallen and Courtright, co-founders of the Kilimanjaro Centre for Community Ophthalmology (KCCO) in Tanzania, three Eye Center faculty members will share their talents far from Emory this year:

### To Burundi

In spring 2012, Phoebe Lenhart, a pediatric ophthalmologist, traveled to Bujumbura, Burundi, Africa, where she took part in a two-week "Paediatric

Ophthalmology Outreach" course at the university hospital there.

See her account, page 19.

### And Madagascar

Another African country will receive Emory Eye Center outreach this summer when oculo-plastics specialist Brent Hayek travels to Madagascar to conduct training in ophthalmic plastic surgery for Malagasy ophthalmologists. He is covering his own costs with help from KCCO. "I am looking forward to the opportunity to serve in a global capacity to provide training to local ophthalmologists and residents in Malagasy. It will also be a mission of fostering relationships and connections between our department and those half way around the world."

### In our backyard

And, closer to home, Annette Giangiacomo was recently awarded an Emory grant to carry out community initiatives in Atlanta. As the Eye Center discovered in initial discussions on global vision, serving those in need within Georgia should and will be a part of this initiative. "We are finding that vigorous collaboration among institutions and organizations will help provide needed eye care for those populations who don't have it," says Giangiacomo. "We look forward to positive outcomes in our underserved areas."

# Surgical Outreach in Burundi

7,687 miles is the distance from Atlanta, Ga., to Bujumbura, Burundi, in eastern Africa. In March 2012, I took part in a Kilimanjaro Center for Community Ophthalmology (KCCO) surgical outreach in Bujumbura. The outreach was funded by KCCO, Seva Canada, Heart to Heart (South Korean NGO), and Wilde Ganzen (Dutch NGO). Burundi is a landlocked and recently war-torn country in central Africa, formerly part of the Belgian Congo. It is one of the poorest countries in the world.

The purpose of the trip was to evaluate the level of need for pediatric cataract surgical services in Burundi. The World Health Organization prioritized the eradication of preventable childhood blindness as part of its VISION 2020: The Right to Sight initiative. Recent efforts have been focused on children with congenital and developmental cataracts. For a year prior to our arrival, local informants identified children with eye disease.

Those children were referred to Bujumbura to be evaluated during the surgical outreach. In most cases, their journey to reach Bujumbura was arduous.

Our team consisted of two pediatric ophthalmologists from the United States, a surgical scrub nurse, outreach coordinator and current ophthalmology resident from Tanzania, a low-vision specialist from Malawi, and additional nurses and an anesthesia team from the host institution in Burundi—Hospital Central de Bujumbura. At any given time, four languages—French, Kirundi, Swahili and English—were being spoken.

Over the course of the two-week outreach, 188 patients were screened and 121 surgeries were performed for 80 children. The response to the initial screeners' efforts was overwhelming; it was not possible during the limited time period to perform surgery for every child that needed it. While the focus of this outreach was pediatric cataracts, there was a great need for pediatric ophthalmology in general—pediatric oculoplastics, glaucoma, retina and strabismus.

The variety and extent of ocular pathology was humbling and the lack of basic services and resources we think little of utilizing every day in the U.S. was sobering. There was nothing to be done for non-infectious corneal opacities as there is no eye bank in Burundi to provide corneal tissue for transplantation. Any child with a retinal problem had to be referred to Kenya or Tanzania, a \$200 bus ride away—a prohibitive cost that we were able to subsidize for a few. Several of the children we evaluated had bilateral retinoblastomas. We offered bilateral enucleations in hope of saving their lives, but the parents of all except one of these children elected to take the children home to their villages instead. As a doctor and a parent, I had a visceral response to the knowledge that these children would die despite the fact that treatment for retinoblastoma is nearly always curative in developed countries.

Despite all of this, there was an undercurrent of peace throughout the surgical outreach. Children invariably express joy at simple pleasures in spite of their sometimes desperate circumstances. Everyone in our multinational, mostly African team worked together tirelessly to provide the best care possible for the kids and their parents.

As for me, time and again I marvel at how even brief experiences like this one lead to new insights—about what is foreign and familiar. In the dozens of brightly dressed but blind children who greeted us our first day in Burundi, I saw the particularly high costs of childhood blindness in developing countries, where blind children suffer higher morbidity and mortality than sighted children. From the representatives of various non-profit and charity organizations I met during my time in Burundi, I began to understand the need to streamline efforts to provide pediatric eye care.

Finally, the happy little girl who greeted me postoperatively one morning—pupils now dark instead of white—indelibly illustrated for me the critical need for ophthalmologists trained specifically in pediatric eye care. I hope that perhaps I can play a future role in this educational effort—both here and abroad.

by Phoebe D. Lenhart, pediatric ophthalmologist



pupils now dark instead of white





## Transplanting the tiniest cornea: a team positioned to act



Above: Pediatric ophthalmologist Phoebe Lenhart and cornea specialist Bhairavi Dholakia consult on Kameron's care following his surgery.

Left: Corneal transplant patient Kameron in the arms of Lenhart, with mother Kimberly looking on.

**For young Kameron Whitehurst's parents, finding an Emory Eye Center pediatric ophthalmologist was the result of a journey.** Kameron, a twin, had been born with Peter's Anomaly, which in his case caused a clouding of his cornea. Kameron was seen by specialists from the age of one month, in both his hometown of Washington, D.C. and in Augusta, Ga.—where dad is in military service. Ultimately, the Whitehurst's ophthalmologist recommended evaluation for a corneal transplant, and the family naturally came to Emory.

"After finding out that a corneal transplant from a donor was our best option, we chose Dr. Lenhart at Emory," says Kimberly Whitehurst, Kameron's mother. "We're very glad we made the trip from Augusta, and we are so pleased with Kameron's outcome," she happily says.

Emory Eye Center is one of the few places in the Southeast where a new-

born or child needing a crucial cornea transplant can have that sight-saving surgery. Emory has a team of specialists poised to perform and manage the complex surgery and follow-up. Pediatric ophthalmologist Phoebe Lenhart and cornea surgeon Bhairavi Dholakia work together in evaluating each patient, performing the surgery, and providing necessary vision rehabilitation and other follow-up treatment such as amblyopia therapy.

Babies and children may require a corneal transplant for a variety of reasons. Among those are cloudiness of the cornea (as Kameron had), systemic disease, or an infection in the eye. In Kameron's case, only one eye was affected.

Cornea transplants in children are difficult cases. "There is more risk performing a corneal transplant on a baby or child than an adult," says Dholakia. "Because the baby's eye is softer, there can be complications. The surgery is

more complex, more intense, and we take extra precautions as a result."

Finding the best time to do the surgery is determined by ophthalmologists. When there is a central cloudiness, surgery needs to be done quickly so that sight can be saved as soon as possible, thereby avoiding amblyopia. With amblyopia, often called "lazy eye," the child's eye has decreased vision. If amblyopia goes on too long, the child can permanently lose vision in that eye, as the brain no longer processes the images coming into the eye.

"Our team efforts at Emory help us decide just when the child needs the surgery," says Dholakia. "Following the procedure, vision rehabilitation is the next important step."

Parents of these children must bring them back for multiple visits following surgery. Although this can be a burden on an already busy family, the visits are critically important in two ways: the child is evaluated on a continuing basis

for signs of amblyopia, and the ophthalmologists can continuously evaluate the viability of the corneal graft.

Parents must also ensure that the child does not rub the surgical eye. And they must put steroidal eye drops in the child's eye for a full year. "They must be vigilant," says Dholakia. "This is a collaboration between the cornea surgeon, the pediatric ophthalmologist and the parents. Working together, we can make sure that the child has the best possible outcome following surgery."

Both Lenhart and Dholakia make sure these children have proper aids for optimal vision. That may mean contact lenses or glasses, depending on the particular needs of the child. The needed lenses help the child "learn" to see—learn to use that eye. To ensure a good outcome, the child's eye needs to be checked multiple times in the first couple of weeks, then on a weekly basis for a few months, and finally monthly for up to the first year after the surgery. Exams under anesthesia may be necessary if an adequate exam cannot be obtained in clinic.

"The surgery is really only the first step," explains Lenhart. "Only with appropriate and timely postoperative care can an optimal visual outcome be realized."

"We're very encouraged by Kameron's progress," says Lenhart. "These children are helped by parents who are invested in their care, and this is certainly the case for Kameron. I have really been inspired by many of these families."

*Support for Emory's Pediatric Cornea Transplant Program is provided by Holcombe Green Jr. and the Jack and Anne Glenn Foundation.*

## RPB funds innovation



Nancy Newman acts as a tele-ophthalmology consultant in her clinical trials of nonmydriatic fundus photography.

Michael Iuvone is an RPB Senior Scientific Investigator.

**Since 1977, Emory Eye Center has received funding from Research to Prevent Blindness (RPB).** RPB helps support research into the causes, treatment and prevention of blinding diseases. To date, RPB has awarded grants of

more than \$3 million to Emory for eye research.

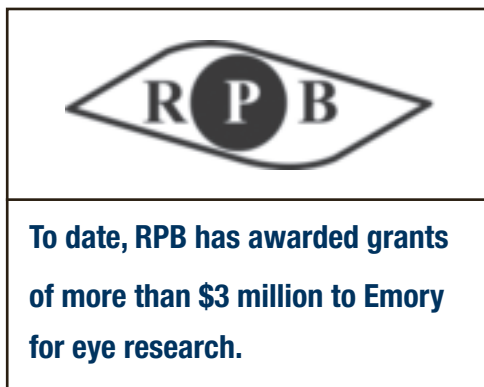
"This annual grant helps us fund small yet important pilot projects for junior faculty, post-doctoral students, graduate students and even an occasional undergraduate," says Michael Iuvone, Emory Eye director of research and RPB Senior Scientific Investigator Awardee.

"Each year we give out nearly a dozen small grants to fund start-up research. My hope for the future is for the department to award a joint grant to a clinician and a researcher in order to foster bench to bedside treatment for blinding eye disease."

"Many of these innovative, but small research projects would not get off the ground without RPB funding," says Eye Center Director Timothy Olsen. "The funds enable innovative work that would otherwise not be possible."

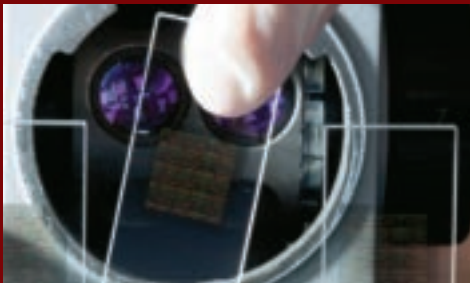
In addition to the departmental grant, RPB helps fund individual faculty members who conduct particular research within their specialties. For example, the RPB Lew Wasserman Award was presented to neuro-ophthalmologist Nancy Newman who serves as a tele-ophthalmology consultant in her clinical trial of nonmydriatic fundus photography, a method that can be used in the emergency department to get a quick, accurate look at the back of the eye, without dilation. The innovative test may lead to better diagnoses in the emergency room.

Since its founding in 1960, RPB has channeled hundreds of millions of dollars to medical institutions throughout the United States for research into all blinding eye diseases.





## Predictive Eye Health



Our 2013 issue of *Emory Eye* will focus on the important work underway in our developing Ocular Predictive Health Program. “The mission of Emory Eye Center’s program is ‘preventive and personalized medicine’ using the knowledge of genetics in eye care,” says physician-scientist Suma Shankar. “Recent advances in genetics are allowing clinicians and scientists to identify disease-causing mutations in affected individuals for numerous inherited eye diseases and disease-associated genetic variations in a number of common complex eye disorders.”

The program will provide clinical services to individual patients and families with inherited diseases by offering clinical genetic testing and genetic counseling services. Additionally, its goal is to maintain and bank cells that will serve as a future repository for individuals with inherited eye disorders. Shankar is currently spearheading this initiative along with research scientist Vincent Ciavatta. She holds Emory joint appointments in the departments of human genetics and ophthalmology. She is affiliated with Emory Healthcare, Children’s Healthcare of Atlanta and the Emory Eye Center. Ciavatta, who holds an appointment at the Atlanta VA as an investigator, also holds an appointment at the Emory Eye Center.

## A new device for end-stage macular degeneration may help some see better

**Emory Eye Center is the first center in Georgia to offer a new technology proven to help the vision of some patients with end-stage age-related macular degeneration (AMD).** The device was FDA approved in July 2010; Emory participated in the



The IMT placed on a finger tip.

clinical trials that helped gain FDA approval. End-stage AMD can cause a loss of central vision, which is not helped by corrective lenses, pharmacotherapy or surgery. Currently, there is no cure for end-stage AMD.

Patients with end-stage AMD affecting both eyes may be candidates for the new device—an implantable miniature telescope—through the CentraSight™ treatment program, developed by VisionCare™, Inc. Implantation in one eye is followed by rehabilitation training to learn how to effectively use the device. Rigorous screening is required to ensure good candidacy for the implant. Interested patients may directly contact VisionCare™ at the number below for complete information.

### Evaluation process

Emory Eye’s team of specialists will evaluate possible patients for

device and study eligibility. Emory retinal specialist Chris Bergstrom will medically evaluate potential candidates. Low vision expert Susan Primo, along with an occupational therapist, will evaluate patients’ visual and functional characteristics, as well as their responsiveness to physical therapy before final approval. Those who have not had cataract surgery in the potential IMT eye are possible candidates.

### The surgery

Corneal surgeon John Kim will implant the device. The implant is inserted into the affected eye through the cornea and placed behind the iris. Images seen through

the tiny telescope are reflected on the part of the macula that has not yet been affected by AMD. Only one eye is implanted; the other eye serves to provide the patient with needed peripheral vision.

### Post-implantation care

There is a long-term commitment of several months to effectively learn how to use the implant. Patients will receive several months of visual rehabilitation training and coordination of low vision care by the vision rehabilitation team. Most patients will still need a form of magnification and low vision devices to meet specific functional goals.

As with any surgery, results may vary, and there may be risks. To better determine if you are a candidate for surgery, call VisionCare’s toll-free number at: 1-877-99-SIGHT (1-877-997-4448).



## ARVO and Emory Eye Center

The Association for Research in Vision and Ophthalmology (ARVO) is the premier vision research organization in the United States and comprises more than 12,700 members worldwide. Its purpose is to encourage and assist research, training, publication, and dissemination of knowledge in vision and ophthalmology. Members are clinical and basic researchers, both MDs and PhDs. Emory Eye's connections with this important organization go back decades, but here are some current facts:

### Presidents of ARVO:

This year, Emory Eye researcher **Jeff Boatright** is the sitting president of ARVO. In 1991 researcher Henry Edelhauser served in that role.

## ARVO Awards

### Fellow Awards

Fellow awards are presented for decades of service to the organization. Fellows serve as mentors to others and to further advance vision research for the prevention of vision disorders.

- Twelve Gold Fellow awards were presented by ARVO in 2012. Two of the 12 were awarded to Emory Eye faculty: EEC director Timothy Olsen and Boatright.
- In the recent past, Edelhauser was named in the inaugural Gold Fellow class.
- Olsen, Boatright and researcher John Nickerson previously attained Silver Fellow status.

### Proctor Medal

- In 2005 Edelhauser received the prestigious Proctor Medal award, ARVO's highest honor in ophthalmic research.

### Trustees

- Edelhauser, Thomas Aaberg Sr. and Boatright have served as trustees of the sections cornea, retina, and biochemistry and molecular biology, respectively.

### Committees

- Nickerson currently serves on the ARVO Awards Committee.
- Mabelle Pardue currently serves on the Annual Meeting Program Committee.
- In the 1990s, Michael Iuvone served on Annual Meeting Program Committee, chaired the Retinal Cell Biology Section and was a member of the Strategic Planning Committee.
- Aaberg served as chair of the Retina Section.

*U.S. News & World Report* has again ranked Emory Eye Center as one of the top ophthalmology programs in the United States. This year, the Eye Center placed at #15. The top ranking eye centers listed in ophthalmology are among the "best for challenging cases and procedures" according to *U.S. News*. The Eye Center is also one of the top 15 NIH-funded eye research institutions in the country.

*U.S. News* also ranked "Top Ophthalmologists" nationwide: These Emory Eye physicians were listed:

**Thomas M. Aaberg Sr.**  
*chair emeritus, retina*

**Allen Beck**  
*glaucoma*

**Valérie Biousse**  
*neuro-ophthalmology*

**Hans Grossniklaus**  
*oncology/pathology*

**Scott Lambert**  
*pediatric ophthalmology*

**Nancy J. Newman**  
*neurology*

**Timothy Olsen**  
*retina*

**Bradley Randleman**  
*cornea, refractive surgery*



**Emory Eye Center** recently produced a video about the history of vitreo-retinal surgery, which has changed dramatically since its beginnings in the 1960s. To view: [eyecenter.emory.edu/retina](http://eyecenter.emory.edu/retina)





**Maria Aaron, MD**, associate professor, comprehensive ophthalmology, was tapped one of Becker's ASC "135 Leading Ophthalmologists in America."

The honor is based on awards received from major organizations in the field, leadership in those organizations, work on professional publications and positions of service.



**Allen Beck, MD**, William and Clara Redmond Professor of Ophthalmology and director, glaucoma, was nominated as member of the

American Academy of Ophthalmology's (AAO) Glaucoma Knowledge Base Panel. He will serve beginning in 2013. His article with Scott Lambert, *Glaucoma-related adverse events in the Infant Aphakia Treatment Study: 1-year results* (*Arch Ophthalmol* 2012 Mar), was selected to appear in F1000, Faculty of 1000 post-publication peer review, which places it in the library of the top 2 percent of published articles in biology and medicine. The service is widely used to find significant new research articles.



**Jeffrey Boatright, PhD**, associate professor, research, was awarded the distinguished Gold Fellow status at the Association for

Research in Vision and Ophthalmology (ARVO), the organization's highest honor. He currently serves as president of ARVO.



**Beau Bruce, MD**, assistant professor, neuro-ophthalmology and neurology, was awarded the North American Neuro-ophthal-

mology Society (NANOS) 2012 Young Investigator Award.



**Mary Carlton, OD**, assistant professor, Vision and Optical Services, became a diplomate of the American Board of Optometry and

was appointed chairman of the Review Committee for the American Board of Optometry.



**Henry Edelhauser, PhD**, professor and former director of research, was honored at the ARVO Foundation for Eye Research (AFER)

gala dinner for his lifetime of work. He is recipient of the 2012 "Start-up Company of the Year" award at Emory for Clearside Biomedical, Inc., which will further develop the joint microneedle technology created with Georgia Tech.



**Annette Giangiacomo, MD**, assistant professor, glaucoma, was awarded an Emory grant through the Office of University-Community

Partnerships to carry out community initiatives in Atlanta that will provide needed eye care to underserved populations. Locally, Giangiacomo serves as a volunteer physician for the Georgia Lions Lighthouse.



**Hans Grossniklaus, MD, MBA**, F. Phinizy Calhoun Jr. Professor and director, L.F. Montgomery Laboratory and the section of

ocular oncology and pathology, was named president-elect of AAOOP (American Association of Oncologists and Ophthalmic Pathologists). He also serves as council chair of the American Ophthalmological Society. Grossniklaus was tapped as an F1000 Faculty Member of the Year for 2011, an international honor for academic physicians. He received an Alcon Research Institute award for \$100,000, given annually to six outstanding senior ophthalmic research scientists selected from a pool of 50 to 100 nominees.



**Baker Hubbard III, MD**, Thomas M. Aaberg Professor and director, vitreoretinal surgery and disease, received the Senior Honor

Award from the American Society of Retina Specialists for his work in pediatric retina disorders.



**Amy Hutchinson, MD**, associate professor, pediatric ophthalmology and strabismus, was named winner of the Atlanta Pediatric

Device Consortium for her Knights Templar project, the "Handy Eye Chart," used for measuring visual acuity of non-verbal children. She was also appointed chair of Prevent Blindness Georgia's board of directors.



**Scott Lambert, MD**, R. Howard Dobbs Professor of Ophthalmology, was guest lecturer at Tianjin Eye Hospital in Tianjin, China.

He also spoke at the annual meeting of the European Pediatric Ophthalmological Society held in Greece. He currently serves as national chair of The Infant Aphakia Treatment Study (IATS). His article with Allen Beck, *Glaucoma-related adverse events in the Infant Aphakia Treatment Study: 1-year results* was selected to appear in F1000, Faculty of 1000 post-publication peer review.



**Susan Lewallen, MD**, visiting scholar, Emory Global Vision Initiative, was co-recipient of the inaugural Woodruff Scholar

Early Independence Award. Funding received provides support for her research, which focuses on preventing blindness, care delivery, global health and health disparities.



**Mary Lynch, MD**, professor, Atlanta Veterans Affairs Medical Center, serves as Association of Veterans Affairs Ophthalmologists

commissioner, on the Joint Commission Allied Health Personnel (2009 to present), and as chair, Field Advisory Committee, Ophthalmology, Department of Veterans Affairs. She is current chair of the national Ophthalmology Consultant Group in Washington, D.C. Lynch also received the 2012 Joseph D. Greene Community Service Award of the Healthcare Georgia Foundation.



**Nancy Newman, MD**, LeoDelle Jolley Professor of Ophthalmology, neuro-ophthalmology, is vice president of the Princeton University

Alumni Association and vice chair of its Alumni Council (2011–13). From 2013–15, she will serve as president of the Princeton Alumni Association and chair of the Alumni Council. She is president-elect of the North American Neuro-Ophthalmology Society.

**Timothy Olsen, MD**, F. Phinizy Calhoun Sr. Professor, vitreoretinal surgery and disease, was awarded the Gold Fel-



low status at ARVO, its most prestigious award. He also was tapped into Becker's ASC "135 Leading Ophthalmologists in America" listing.

Olsen was elected to the Center for the Visually Impaired, board of trustees. He was selected to chair the AAO's Preferred Practice Patterns, a group of retina experts who determine the standard of practice in retina.



**Paul Pruett, MD**, assistant professor, glaucoma, serves on the Fellowship Compliance Committee of the American Glaucoma Society.

He also serves as residency program director and received the Thomas M. Aaberg Sr. Clinical Teaching Award for 2011.

**Bradley Randleman, MD**, associate professor, cornea, external disease and refractive surgery, is recipient of the Kritzinger Memorial Award, given by



the International Society of Refractive Surgery of the American Academy of Ophthalmology to a recipient who embodies impressive

qualities of Dr. Kritzinger. Randleman also was tapped into Becker's ASC "135 Leading Ophthalmologists in America" listing.



**Ann Van Wie, OD**, assistant professor, Vision and Optical Services, became a diplomate of the American Board of Optometry and

serves as a committee member.



**Jiong Yan, MD**, assistant professor, vitreoretinal surgery and disease, was inducted into the Retina Society for ongoing excellence,

leadership, and productivity in the care of patients with vitreoretinal diseases, retinal research, teaching, and the publication of related scholarly works.

**Steven Yeh, MD**, assistant professor, vitreoretinal surgery and disease, was



awarded a Knights Templar grant to study pediatric uveitis. He serves on the Standardization of Uveitis Nomenclature (SUN) Working

Group, an international collaboration of uveitis and ocular immunology specialists to systematically classify rare uveitis syndromes.



NEW FACULTY:

**Vinay Aakalu, MD, MPH** will join the Eye Center in January 2013 in the section of oculoplastics, orbital and cosmetic surgery. He received his undergraduate degree in neuroscience from The Johns Hopkins University. He attended medical school at Mount Sinai School of Medicine and completed a master's of public health from Columbia University. Aakalu completed an intern-



ship at St. Luke's-Roosevelt Hospital in New York followed by an ophthalmology residency at the Illinois Eye and Ear Infirmary, where

he was elected chief resident. He then completed a two-year American Society of Ophthalmic Plastic & Reconstructive Surgery approved fellowship in oculo-facial plastic and reconstructive surgery at the Illinois Eye and Ear Infirmary. Aakalu has clinical interests in the full range of functional and cosmetic oculo-facial surgery and orbital surgery. He has particular interests in ocular surface reconstruction and orbital inflammatory diseases, orbital trauma and orbital neoplasms. His research interests include lacrimal cell biology, orbital imaging techniques and outcomes analysis of clinical interventions.



**Ross Ethier, PhD,** joins the Eye Center as an adjunct professor in the research section. Ethier served as head of the department

of bioengineering at Imperial College, London. Prior to that, he served as director of the Institute of Biomaterials and Biomedical Engineering at the University of Toronto, where he was a

professor of bioengineering, mechanical engineering and ophthalmology. He received his doctorate from MIT in 1986. Ethier is a bioengineer with a long-standing interest in understanding the biomechanics and mechanobiology of intraocular pressure regulation and retinal ganglion cell function in healthy and glaucomatous eyes. He is a fellow of ARVO and several other professional societies. Ethier serves on the editorial board of the *Investigative Ophthalmology and Visual Science* journal.

**Andrew M. Hendrick, MD** joins the Eye Center this summer in the section of vitreoretinal surgery and diseases. He received his undergraduate degree from the University of Wisconsin-Madison.



He attended medical school at Ohio State University and completed a preliminary medicine internship at Exemplar St. Joseph Hospital in

Denver. He finished his ophthalmology residency at the University of Colorado and completed a vitreoretinal surgery fellowship at the University of Wisconsin-Madison. Hendrick is a member of the American Academy of Ophthalmology, American Society of Retinal Specialists, and ARVO. His clinical interests include retinal vascular disease such as retinal vein occlusion, medical and surgical management of diabetic retinopathy, age-related macular degeneration and retinal detachment.

**Hee Joon Kim, MD** joins the Eye Center this summer in the section of oculoplastics, orbital and cosmetic surgery. She completed her medical degree and internship at The University of Texas Medical School at Houston and continued her ophthalmology residency

at the Cizik Eye Center, The University of Texas Medical School at Houston,



where she served as chief resident. She continued her training at the Emory Eye Center with a two-year fellowship in oculoplastics, or-

bita and cosmetic surgery. Her clinical interests include medical and surgical management of adult and pediatric conditions involving the eye sockets, eyelids and tear drains. Kim's research interests include orbital implants, infectious processes of the orbit, eyelid and orbital tumors, and thyroid eye disease.

**Xiaoqin Alexa Lu, MD** joined the Eye Center in the spring in the section of comprehensive ophthalmology. Her undergraduate degree is from Cornell University. She attended medical school



at the University of Vermont College of Medicine and completed a preliminary medicine internship at Mount Auburn Hospital,

Harvard Medical School. She finished her ophthalmology residency at Rhode Island Hospital, Brown Medical School, and completed a cornea, refractive and anterior segment surgery fellowship at Shiley Eye Center, University of California, San Diego. Lu's clinical interests include adult comprehensive ophthalmology, cataract and laser surgery, and ophthalmic manifestations of systemic disease, including diabetic retinopathy, dry eye syndrome and general anterior segment diseases. Her research interests include medical ethics and international eye care.

# Waiting?

## Take a fresh look: For the pleasure of seeing

If you've visited the third floor of the Emory Eye Center lately, you've definitely noticed our spacious new look. Another new element here invites attention as well, both in the waiting room and in the inner hallways: a valuable collection of vintage French art posters, donated by Ron and Barbara Balser.





Much “corporate art” blandly allows the eye to slide by, offering little to snag interest. Our clinic, though, exists to help you see better, see more, and take new pleasure in seeing. The Balsers’ eye-catching collection of 19 framed posters, distributed throughout our clinic, beckons you to do exactly that. You can take a fresh look every time you’re here.

**Storytellers.** Expect to see names and styles that you recognize—Picasso, Matisse, and Toulouse-Lautrec. As you take in each image, envision the history that lives in these posters: the exciting Parisian exhibitions of individual artists who represent the robust Post-Impressionist period.

The posters also tell another story—of the man who spent decades collecting them, one by one. Imagine an American college student visiting Paris in the late 1950s, relishing the vintage art posters sold in shops and galleries. Over multiple trips to Paris, Balser became friendly with Heinz Berggruen, Picasso’s art dealer; and from Berggruen’s shop on the Left Bank, he bought some of the posters now in the third floor collection.

“I started buying French art posters just because I love them. And for pleasure,” Balser recalls. “They’re original works, each one approved by the artist to be printed. A lot of the world’s renowned museums—the Louvre, the Met, MOMA, the Library of Congress—exhibit image posters and have permanent collections of them.”

Almost half a century later, Balser’s carefully gathered collection lives at Emory Eye Center, on display for the very first time. “These posters have never seen daylight, which is one reason why their colors are so vivid,” Balser says.

**Messages.** Perfect for an ophthalmology setting, the posters were designed expressly to catch glances from passers-by. “They’re advertisements, in a way,” Balser explains, “so visually, they call out, ‘Look at me!’”

More subtly, the gift of his long-cherished posters speaks of Balser’s gratitude to Emory Eye Center and to Timothy Olsen in particular, who treated Balser for an eye problem in 2011. “Tim Olsen is one of the best professionals I’ve ever dealt with,” Balser says. “And I love what the Eye Center is doing. I’ve noticed people in the waiting room who look as

though they may not be able to afford the quality of care that this clinic is giving. But they’re getting it anyway. I’ve been impressed by that ethic, and I wanted to give back—in a way that was special.”

When Balser learned that the third floor was undergoing renovations, he knew what he wanted to do: “The posters were ideally suited for that space, because they’re visually exciting and stimulating.”

**Collector’s items.** Following Balser’s instructions, the posters have received expert museum-quality mounting and framing from Atlanta’s widely known Myott Studio. Inside their white mats and silver brushed-aluminum frames, the images look well cared for and elegant.

For the Balsers, giving is a long-established habit. Emory’s Goizueta Business School is now home to an extensive Balser art collection, along with four granite-crafted benches of Ron Balser’s own original design. Additional signature benches are installed at sites throughout the country, including the Georgia Aquarium, the Staglin Family Vineyard, the Golisano Children’s Museum of Naples, Fla., and Naples Community Hospital North. Each bench is engraved with one of the wise and pithy phrases that

Balser says he scribbled on scraps of paper for years before copyrighting them.

**Gifts.** Balser admits that some of the posters—particularly the brightly colored Picasso clown—were a little hard to let go. “But when one gives from the heart,” he says, “a piece of the giver goes along, too. That’s the joy!”

Sharing joy through art is central to Balser’s life. “I feel really good that Barbara and I could do something for the Eye Center that it couldn’t have done for itself,” he says. “I think that many patients who come in for eye treatments are probably worried. My hope is that the collection will be uplifting.”

The next time you’re on the third floor, try a new way of lightening your own worries. Take a fresh look: not only at our fine new posters, but also through the discerning eyes and generous heart of Ron Balser—who understands the pleasure of seeing, and the pleasure of passing it on.

THROW PASSES TO THOSE IN NEED

PEOPLE YOU LOVE

YOUR OLDER SELF

THE NEXT GENERATION

THE PERSON YOU WANT TO BE

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A LIGHTING INDUSTRY EXECUTIVE and amateur photographer, Charles Darnell says illumination has been important to his personal and professional lives.

When a serious eye condition threatened his vision, he sought expert care at the Emory Eye Center. After successful treatment, Darnell became involved with the center's advisory council and has helped design lighting for renovated treatment rooms and offices. To show his appreciation, he made a bequest to support research and patient care at the center.

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