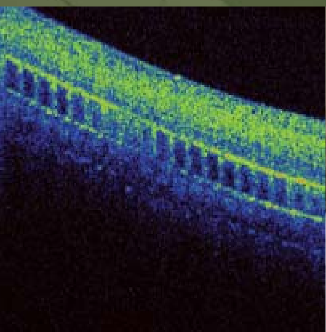
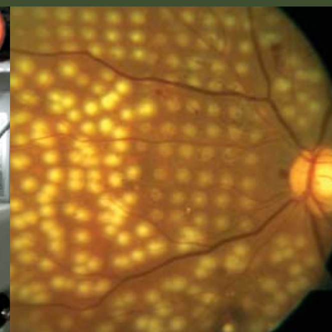
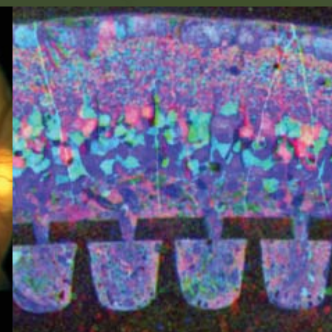
STANFORD UNIVERSITY
MEDICAL CENTER

DEPARTMENT OF OPHTHALMOLOGY

TRANSLATIONAL COLLABORATIVE

A continuum of past accomplishments and future promise




The mission of the Department of Ophthalmology at Stanford is to be among the best in the world in promoting ocular health through the prevention of disease and the treatment of potentially blinding eye conditions. We aim to do this by providing technically outstanding and compassionate care for our patients and training the next generation of leaders and practitioners in the areas of patient care, scientific vision research, and teaching.

Stanford Ophthalmology is on the road to an exciting new chapter in its history: the creation of the Eye Institute at Stanford.

I thought it might be worth a brief look in the rearview mirror to celebrate where we have been in anticipation of the important milestone that is about to occur.

The department is the oldest in the western United States. It was established by Adolph Barkan, who was the leading ophthalmologist in the entire region in the late 19th Century. In 1872, he was appointed the first Professor of Ophthalmology at the California Pacific Medical Center, later renamed Cooper Medical College. In 1908, Cooper Medical College became the Stanford University School of Medicine, which did not integrate with the main campus in Palo Alto until 1959.

Over the ensuing four decades, the department developed a reputation as a small but solid training program for residents and medical students. The number of full-time faculty typically did not exceed five, and there were only two or three residents per year. Over the past dozen years, the department has embarked on an ambitious program to enhance its national stature through an increase in the number of faculty, from seven to 24 full-time members.

The department has also undertaken a series of research initiatives in vision science. Programs in ophthalmic tissue engineering, microsurgical devices and lasers, infection prevention, neuroscience, and regenerative medicine are outlined in the pages that follow.

In 2000, we began to develop a blueprint for new physical facilities that would enable the department to move to the next level. At that time, the department still occupied roughly the same footprint as when it had originally moved from San Francisco. In the fall of 2008, the leadership of the Stanford University Medical Center approved the creation of a dedicated facility for clinical care and teaching. Construction is now underway, and we anticipate that by the end of 2010, the department will move into the state-of-the-art facility. The Eye Institute will elevate patient care and medical education to the highest level and enable Stanford Ophthalmology to assume its place among the most elite departments in the nation.

Simultaneously, we will expand research programs through the Stanford Center for Vision and Blindness Prevention. Founded in 2009, it is an interdisciplinary initiative linking the basic and translational vision scientists throughout the university. We expect that the core facilities will leverage the interdisciplinary strengths of the vision science community at Stanford.

All of the incredibly important people and projects encompassed by the department cannot be fully listed in a publication of this size, but I hope that these stories will provide some insight into some of the many exciting developments. The narratives emphasize the personal and sometimes serendipitous events that lead to important biomedical discoveries. While a key objective of all research universities is the general expansion of knowledge, our department subscribes to the notion that applied or translational research specifically targeting the diagnosis and treatment of diseases is an especially noble and worthwhile endeavor.

I hope you enjoy these stories and take the time to become better acquainted with us as a department. It is my hope that this represents just the beginning, not the culmination, of a great journey.

Sincerely,

Mark S. Blumenkranz, MD, MMS
Professor and Chair

Zapping Away Blindness

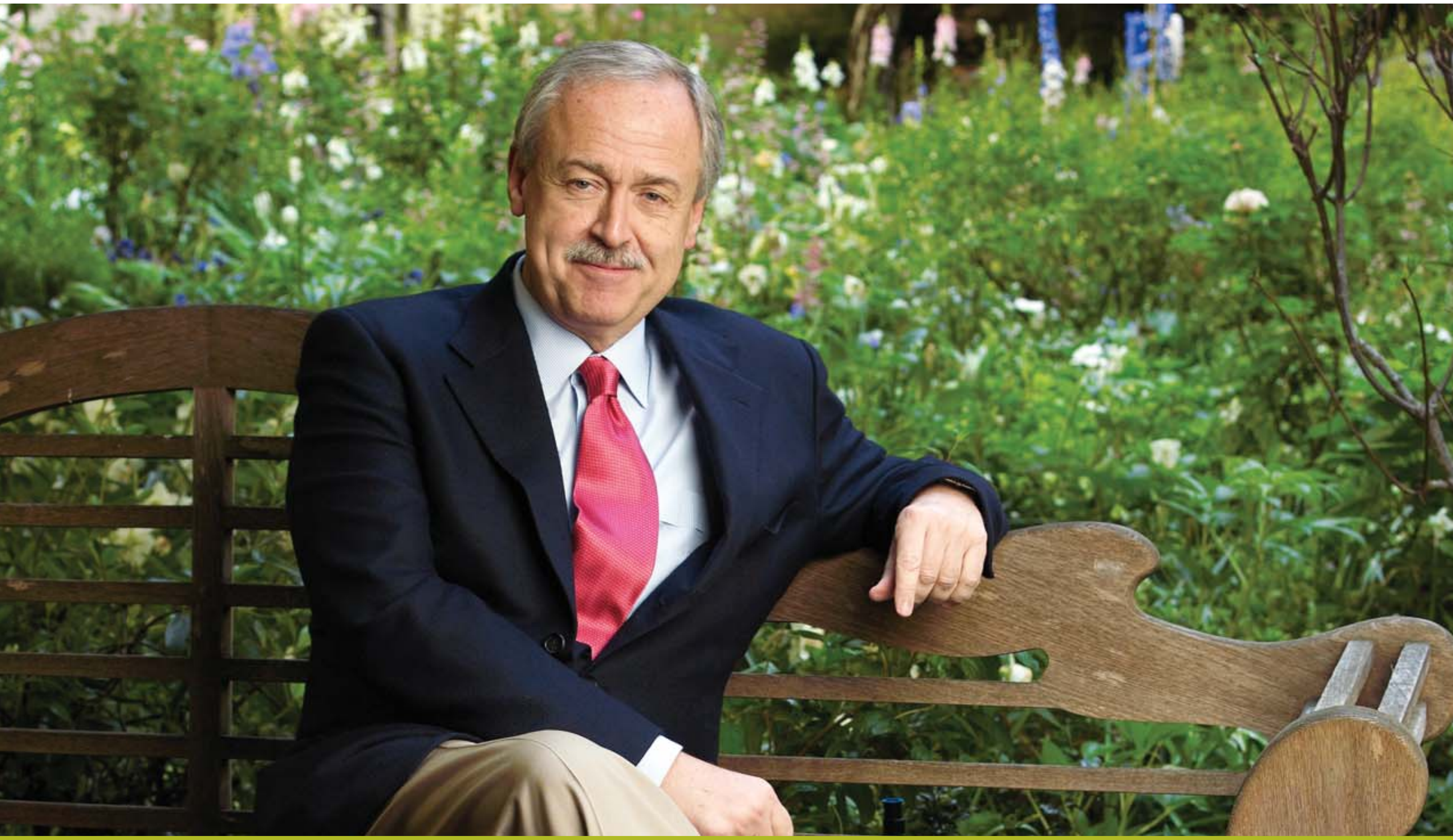
Mark Blumenkranz uses lasers to treat blinding eye diseases

Lasers have the power to treat many of the most debilitating eye diseases. Cataracts, macular degeneration, glaucoma and diabetic retinopathy are potentially blinding conditions that afflict nearly 36 million older Americans.

The Department of Ophthalmology at Stanford University has a long history of developing cutting-edge laser techniques to tackle the most serious eye disorders.

Stanford faculty were involved in developing the first commercial ophthalmic lasers in the late 1960s and early 1970s. By that time, diabetic patients were able to live longer because of the availability of insulin as a treatment. One unintended consequence was that many of these patients began developing severe forms of retinopathy, a leading cause of blindness in older Americans. “The lasers were a major breakthrough that led to the dramatic reduction of blindness caused by diabetic retinopathy, which until that time was essentially untreatable,” says **Mark Blumenkranz,** who was an ophthalmology resident at Stanford when the lasers were first being tested in large clinical trials. After learning about this technique, Blumenkranz, now the department chair, decided to pursue research on using lasers to treat eye diseases.

Soon after Blumenkranz became the department chair in 1997, he teamed up with Daniel Palanker, then a physics postdoctoral fellow, to reevaluate the fundamental premises of how lasers were used to treat the eye. Silicon Valley had by then become a hotbed of medical device technology and manufacturing. Still, innovation was lacking in the lasers that were being developed to treat blinding diseases, such as retinopathy, which causes blood vessels to leak, grow abnormally and damage light-sensitive tissue at the back of the eye; glaucoma, which causes fluids to build up and injure the fibers that transmit information from the eye to the brain; and cataracts, the clouding of the lens in the front of the eye that helps to focus light. “Overall, the treatments from a patient’s standpoint were really for the most part identical from 1975 to 2005,” Blumenkranz says.



Stanford's fortuitous position in Silicon Valley provided easy access to the latest generation of microprocessors and sophisticated instrumentation for laser delivery systems. The duo took advantage of the available technology to create a scanning laser that nearly simultaneously delivers an array of spots on the eye; this replaced the standard technique that delivers single spots sequentially. The scanner could flexibly alter the arrays to make any pattern in the eye. They also shortened the laser pulse duration, which dramatically sped up treatment: the whole procedure could take place in a single session lasting 5 to 10 minutes rather than three 20-minute sessions. This improvement also reduced tissue damage, pain and vision problems from the procedure.

"Scarring was considered to be an unavoidable side effect of laser surgery, leading to blind spots that expand over time," Palanker says. In contrast, their method appears to dramatically reduce scarring and blind spots. This technology was licensed in 2006 to a company that manufactures lasers in Silicon Valley, and it has since won numerous awards. An estimated 500,000 patients have been treated with this new procedure worldwide.

"We made a strong case for changing the way lasers should be used to treat diabetic retinopathy," Blumenkranz says. "Since then, the standard of care around the world has changed. It's fair to say that in another five years, it will be very unlikely that physicians will still use single spot lasers for retinal applications."

Currently, Blumenkranz is investigating safe, low energy laser procedures to treat patients with macular degeneration, which causes vision loss in the center of the visual field. Unexpectedly, his team found that low energy pulses can stimulate cells to multiply, replace damaged cells and restore function. Blumenkranz plans to run clinical trials to test the feasibility of using low intensity patterned lasers to treat macular degeneration. Faculty in the department continue to optimize the laser procedure and explore its use in treating other diseases, such as glaucoma and cataracts. ❖

Patient Turned Practitioner

Daniel Palanker has developed innovative medical tools that are revolutionizing the treatment of eye diseases. Ironically, the breakthroughs he has made as a professor in the ophthalmology department arose in part from his experiences as an eye patient.

Palanker has always been fascinated by physics and medicine, though he was unable to unite his disparate interests until a lab accident threatened to permanently destroy his vision. In 1996, he came to Stanford to pursue a postdoctoral fellowship in laser physics. He was

Daniel Palanker's own eye injury inspires his research on laser surgical tools

aligning an invisible laser under a table when the laser inadvertently crossed his eye. When he noticed that his vision was affected, he rushed to the Stanford Hospital, where he saw ophthalmologist Michael Marmor.

"Mike Marmor gave me perfect care; he's a world-class specialist," says Palanker, now an associate professor of ophthalmology. Many doctors in the emergency room would not have diagnosed eye damage, because he showed no obvious signs of injury. But Marmor detected a small laser burn in the corner of his eye. Luckily, he found that the injury would not lead to extensive damage, and Palanker would not have to be treated for it. "It was a very important decision," says Palanker, who was concerned about potential complications associated with surgery. "He made the right judgment. The injury healed in a few weeks, all by itself, without any consequences."

Palanker's accident had a silver lining: it allowed him to finally merge his background in physics with his interest in solving medical problems. During a follow-up visit, he told Marmor that he had several ideas about using lasers and electronic tools for eye surgery, and Marmor suggested that he contact Mark Blumenkranz, an ophthalmologist and newly appointed department chair. When they first met, Blumenkranz was struck by Palanker's intellect, natural curiosity and past scientific accomplishments. They started collaborating on research, and shortly thereafter, Blumenkranz offered him a position as assistant professor.

Since he joined the faculty, Palanker has made tremendous progress in developing a variety of therapeutic tools that improve surgical precision and reduce potential complications. One technique, called the Pulsed Electron Avalanche Knife (PEAK), is an electrosurgical tool that allows for traction-free cutting of any soft tissue with very precise control over incisions. It reduces many of the side effects associated with traditional surgical methods, including bleeding, scarring and pain. PEAK minimizes heat damage because it emits very short, intermittent bursts of electric pulses, and there is plenty of time for the tissue to cool between pulses. Having received approval by the Food and Drug Administration in 2008, PEAK is now being used primarily for plastic and reconstructive surgery, as well as ob-gyn procedures—operations that are sensitive to thermal damage and demand top-notch aesthetic results. "Spin-offs of technology developed in the department have utility well beyond the field of ophthalmology," Blumenkranz says.

To find practical, large-scale applications for the tool he had spent years developing, Palanker worked with the Stanford Office of Technology and Licensing to identify a company, PEAK Surgical, that would license this technology. "Commercial enterprise is absolutely essential," Palanker says. "An academic institution on its own can't develop a system that will end up in a hospital." Stanford's unique position in the entrepreneurial environment of Silicon Valley, where PEAK Surgical is located, serves as a huge advantage, Palanker says.

Another unique advantage of Stanford is that the medical school and basic science departments are located on the same campus. "It's very important to meet on a daily basis with physicians and surgeons to make sure that the devices developed make sense from their perspective," Palanker says. The interdisciplinary interactions the campus fosters were instrumental for the development of a new type of retinal prosthetic device, which required close collaborations with the electrical engineering and neurobiology departments. The retinal implant, or array of electrodes placed at the back of the eye, would stimulate cells, restore partial vision and make vision sharper and more natural, like high-definition television. Unlike current retinal implants, Palanker's version would allow blind patients to see objects, recognize faces and make out meaningful images, instead of seeing only fuzzy borders between light and dark areas. Though his implant has not been approved for use in humans yet, Palanker is hopeful about starting clinical trials soon. ❖

Joyce Liao aspires to treat eye injuries with stem cells

The eye is one of the most delicate and complex machines in the body. Most eye cells generally do not recover after they die, and replacing these cells poses an enormous challenge. One promising therapy involves embryonic stem cells, which can become many different cell types.

Y. Joyce Liao, assistant professor of ophthalmology, someday hopes to transplant stem cells into the eye to replace dead cells in the optic nerve, the collection of fibers that transmit information from the eye to the brain. "Currently there's no effective treatment for traumatic injuries or stroke in the optic nerve, even though they're common problems," Liao says.

Similar to many scientists, Liao begins her experiments in a dish. She uses a chemical cocktail to coax embryonic stem cells to morph into specific eye cells. Then she transplants the cells into the damaged eye. That's where the similarities with other scientists

On *the* Front Lines

end. Next, she uses a laser to stimulate the eye, and something remarkable happens: the transplanted cells mature and repopulate important cells in the eye.

This final stage is where being at Stanford provides her with an edge: she uses a state-of-the-art eye laser that was developed by Stanford vision researchers Daniel Palanker and Mark Blumenkranz to help transplanted stem cells adjust to their new environment inside the eye. Currently, the laser treats diabetic patients who are visually impaired or at risk for losing eye function. “My idea was that this laser could also be used to promote stem cell transplantation in humans in the future,” Liao says. She hopes to test this treatment in humans within the next five years.

In the future, Liao would also like to investigate how the laser makes the eye receptive to stem cells. What’s more, she is discovering molecules that protect eye cells from dying after a sudden interruption in blood supply. The reason for her efforts is simple: “Vision is one of the most important functions in the brain,” she says.

Although Liao has been an assistant professor at Stanford for only two years, she is making significant headway in her research and collaborative efforts. She played a key role in the creation of the Stanford Center for Vision and Blindness Prevention—a group of vision scientists spanning a range of disciplines. Their goal is to develop practical solutions for restoring vision and precluding blindness. “This collaboration gives us the expertise in all areas of science to allow us to approach eye diseases and solutions from different perspectives,” Liao says.

After stints at Harvard for her undergraduate studies and the University of California, San Francisco, for her MD and PhD, Liao completed neurology training at Stanford. She then specialized in neuro-ophthalmology because she wanted to attack challenging clinical problems that lack effective treatments. Now she’s on the front lines of treating patients. “Being able to offer them effective therapies and measure how their vision improves is very rewarding.” Liao says. “In the end, I have to answer to my patients.” ❖

Excellence at

Many Stanford ophthalmologists have been voted the *Best Doctors in America*

Mark S. Blumenkranz, MD

Deborah Alcorn, MD

James Egbert, MD

Peter R. Egbert, MD

Douglas Fredrick, MD

Jonathan Kim, MD

Edward E. Manche, MD

Michael F. Marmor, MD

Darius M. Moshfeghi, MD

Kuldev Singh, MD MPH

Ira G. Wong, MD

SOURCE: WWW.BESTDOCTORS.COM

Stanford ophthalmologists and vision scientists were among the first to explain many unsolved mysteries of the eye and introduce methods to combat blindness

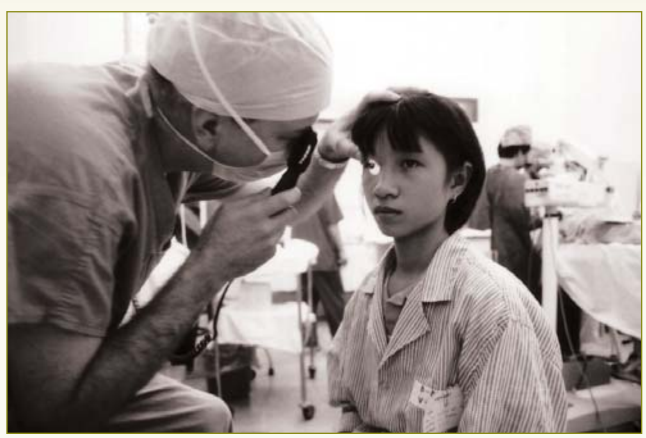
- The first demonstration of normal blood flow in the eye with fluorescein dye-enhanced photography *(Milton Flocks)*
- The first explanation of why the cornea is clear and how fluid is transported in and out to nourish it *(David Maurice)*
- An explanation of how drugs are transported out of the eye *(David Maurice)*
- The description of the osmotic pumping mechanism that keeps the retina attached to the pigment epithelium *(Michael Marmor)*
- A new category of inherited degenerations of the macula that are genetically determined *(Michael Marmor and Douglas Vollrath)*
- The first use of a modern laser to treat the retina *(Christian Zweng and Milton Flocks)*
- The first description of a modern laser-slit lamp delivery system *(Christian Zweng and Hunter Little)*
- The first description of a pattern-scan laser delivery system *(Mark Blumenkranz and Daniel Palanker)*
- The first descriptions of the use of steroids to successfully treat retinal vein occlusion *(Mark Blumenkranz)*
- The first use of a pulsed digital electronic scalpel for improved precision cutting and reduced bleeding compared to conventional tools *(Daniel Palanker)*
- The first description of a flexible subretinal chip for high-resolution prosthetic retinal vision *(Daniel Palanker)*
- The first use of a femtosecond laser to replace manual portions of cataract surgery *(Mark Blumenkranz and Daniel Palanker)*
- The first description of a new class of hydrogel polymers that can be used for an artificial cornea *(Christopher Ta)*
- The first report of the safety of Ranibizumab (Lucentis) in humans for macular degeneration *(Mark Blumenkranz)*
- The first large-scale report of the effectiveness of wide-angle photographic screening and remote interpretation for detection of retinopathy of prematurity in pre-term infants *(Darius Moshfeghi)*
- One of the first prospective large-scale reports to suggest that digital monochromatic photographic screening with remote interpretation is comparable and potentially superior to a routine eye exam in detecting diabetic retinopathy *(Mark Blumenkranz)*

First Stanford

Stanford spirit spreads overseas

Peter Egbert, professor emeritus of ophthalmology, has spent the last 20 years establishing self-sustaining eye centers in Ghana and Honduras. Eighty percent of blindness occurs in developing countries, and 80% of those cases are preventable and curable, says Egbert, who received the Outstanding Humanitarian Award from the American Academy of Ophthalmology in 2004. He partners with local organizations to bring training, capital and equipment to clinics that use volunteer ophthalmologists. He also visits overseas clinics for a few weeks or months each year to treat glaucoma and cataracts. First becoming interested in this work when he was a resident volunteer in Haiti, Egbert hopes to inspire the next generation of ophthalmologists. “I’ve taken several residents to Ghana, and some of them have started to set up local groups themselves,” he says.

Douglas Fredrick, clinical professor of ophthalmology, has initiated programs to teach international physicians how to evaluate and treat infants with retinopathy of prematurity, a potentially blinding condition in which blood vessels develop abnormally. The condition affects thousands of newborn babies around the world; babies born many weeks premature are especially susceptible. Fredrick has invited Vietnamese ophthalmologists to the U.S. for training, and he monitors their progress in their home country. “I hope to get this model of education adopted in other developing nations,” he says.

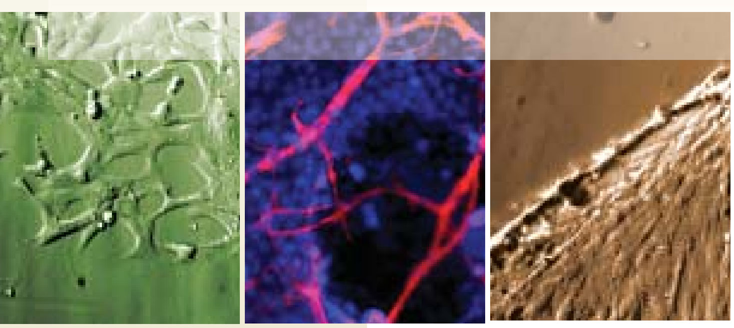


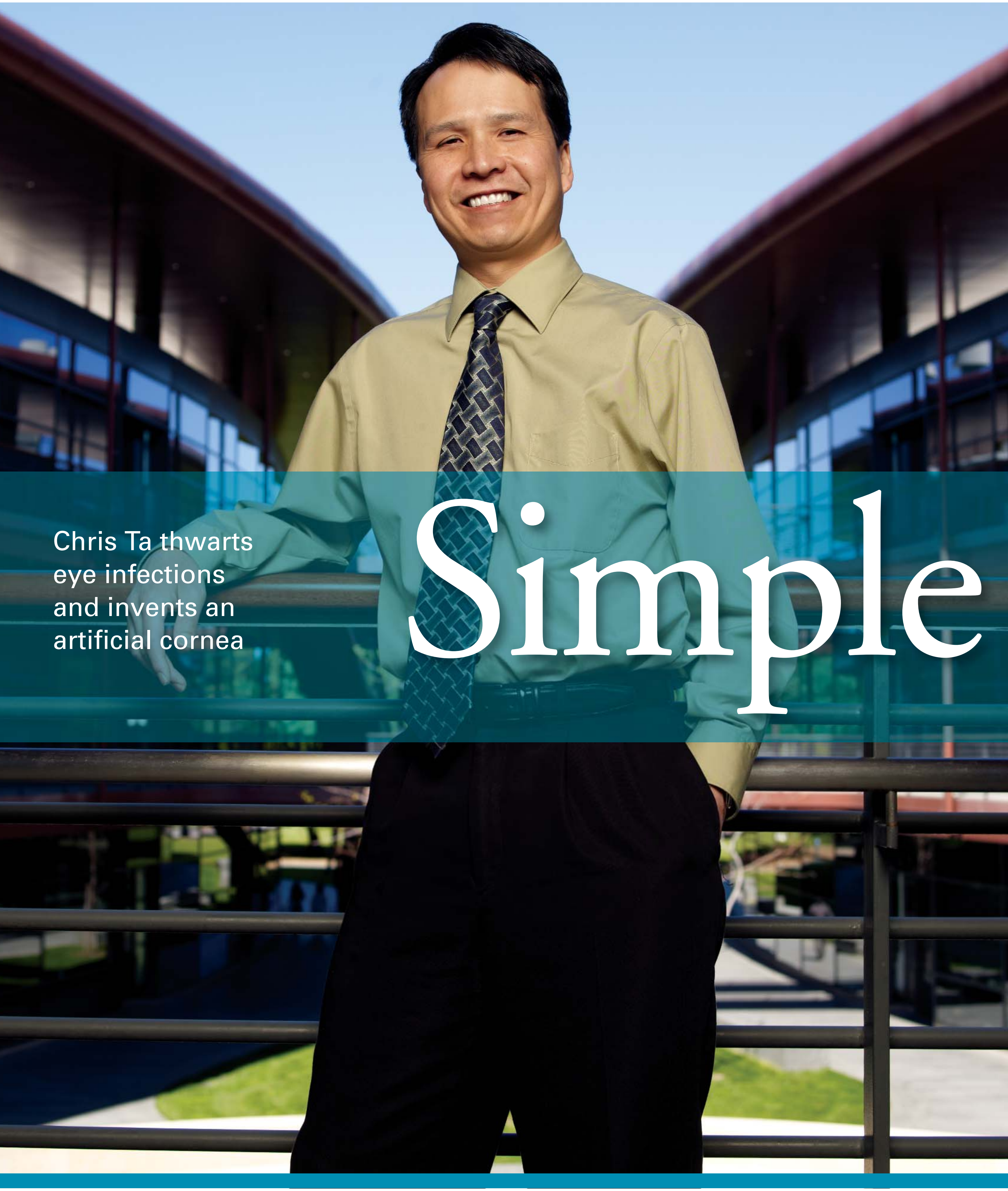
DOUGLAS FREDRICK PERFORMS AN EYE EXAM OF A PATIENT IN VIETNAM.

Stanford opthalmologists receive national attention and accolades

Michael Marmor has written several books about artists and eye disease, and he has simulated with computers how impressionist painters with eye diseases would have seen their own masterpieces. His research suggests that the artists’ deteriorating eyesight may have influenced their paintings.

In 2004, the American Academy of Ophthalmology **bestowed upon Peter Egbert the Outstanding Humanitarian Award** of the year for his work in developing countries.





Simple

Chris Ta thwarts eye infections and invents an artificial cornea

Christopher Ta joined the faculty at Stanford because he wanted to make a difference in patients' lives. Ten years ago, he decided on his mission: to develop new ways of replacing the cornea, the transparent part of the front of the eye that focuses light. But early in his career, he got side-tracked by another pressing issue: a sudden and unusual cluster of eye infections in surgical patients at Stanford Hospital.

At the request of Mark Blumenkranz, the department chair, Ta spearheaded an investigation into possible causes. In the course of his investigation, Ta shifted his research focus from replacing the cornea to preventing infections. "Infections after ocular surgeries are quite rare, but they can lead to severe vision loss," says Ta, now an associate professor of ophthalmology and residency director. "That's why it's important to minimize the risk."

"We essentially converted prosaic quality assurance into an important area of research that prevented many people from going blind," Blumenkranz says.

Although Ta continues to investigate ways of improving surgical outcomes, he has returned to his original interest in corneal transplants. In collaboration with scientists in the chemical engineering and bioengineering departments, his team is developing an artificial cornea that may benefit millions of patients worldwide. About 40,000 corneal transplants are performed in the U.S. each year, and the major risk for these patients is rejection of donor tissue. In contrast to human tissue, the artificial cornea can eliminate the risk of rejection, and may potentially be cheaper and easier to mass produce and distribute around the globe.

and High-tech

Previous studies had indicated that antibiotics, which kill microbes inside the body, and antiseptics, which kill microbes on tissue or skin, reduce the risk of infection. Ta's team performed a comprehensive and careful analysis, which included the latest antibiotics, and pinpointed the most effective combination for reducing bacteria on the eye's surface. Applying several antibiotics to the eye between one and three days before surgery, and scrubbing the area around the eye with an antiseptic called povidone-iodine immediately before surgery, significantly reduced the number of bacteria on the eye's surface at the time of surgery. This intervention may also decrease the risk of infections after operations. Armed with his findings, Ta has served on advisory panels to develop guidelines for minimizing infections after eye procedures.

The artificial cornea is made of a strong and flexible material called a hydrogel. The hydrogel, similar to a contact lens, is 90% water and made of a network of large molecules. It acts like a miniature fishnet: the outside part has pores that allow cells to integrate with it and nutrients to flow through. Since it mimics the natural cellular environment, it reduces the risk of an immune reaction compared to other types of artificial implants.

Currently, Ta's interdisciplinary team is optimizing the hydrogel's properties so that it will integrate with eye tissue without causing inflammation. The artificial cornea has not reached clinical trials in humans yet, but Ta hopes to bring the technology to patients worldwide in the near future. ❖

Paving the

Nationally recognized as a leading ophthalmologist, **Edward Manche** has performed more than 28,000 laser vision correction procedures. In addition to correcting vision in thousands of patients, he strives to optimize patient outcomes and quality of life.

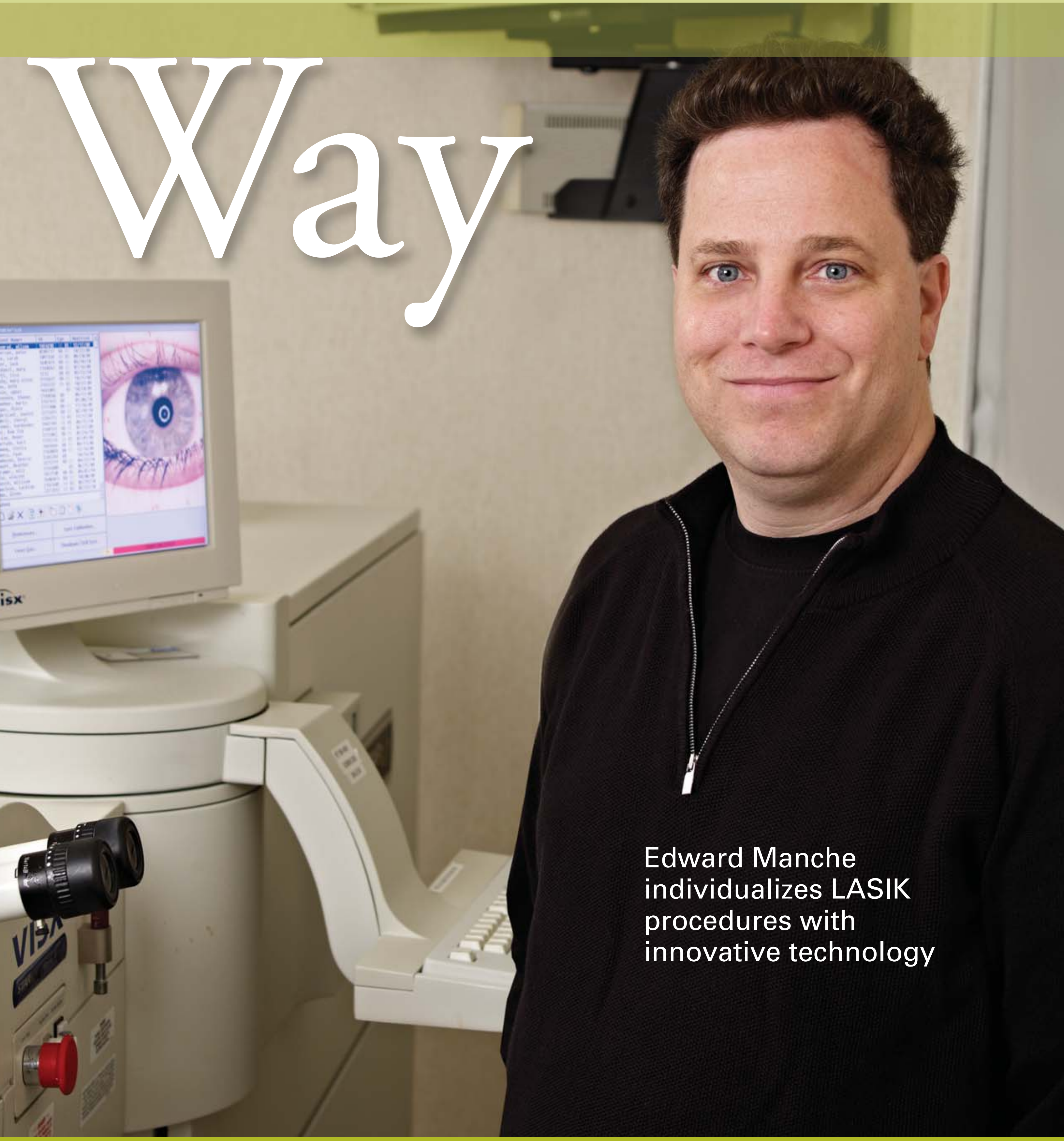
Manche was among the first to use LASIK, or Laser-Assisted In-Situ Keratomileusis, which is now the procedure of choice to correct nearsightedness, farsightedness and astigmatism because it's effective, safe, and offers rapid visual recovery. Custom LASIK uses a wavefront measuring device that scans the eye and creates a map of its irregularities. It also detects high-order aberrations, which can cause glare and decreased night vision. Using a laser system that has been fed information from the wavefront map, surgeons cut open the corneal flap, expose the cornea to a series of pulses that remove small bits of corneal tissue, and then replace the flap. Ophthalmologists at the Stanford Eye Laser Center use individualized maps to design a customized laser treatment for each patient.

In 2003, Manche introduced the laser center to IntraLASIK, which uses a laser instead of a blade to cut the corneal flap during the LASIK procedure. In his clinical studies, the IntraLASIK method produced better outcomes than traditional bladed devices, and it has now replaced bladed devices at Stanford and other eye clinics nationwide. For patients who don't qualify for LASIK for various reasons, such as a thin cornea, the Stanford Laser Center offers other refractive procedures, such as photorefractive keratectomy, which uses a laser to remove corneal tissue without creating a flap. "Many of the procedures pioneered here at Stanford are now commonly used in clinical practice," Manche says.

Manche is also interested in treating people with keratoconus and keratectasia, which are conditions associated with an abnormal bulging of the cornea. These are sight-threatening conditions with few good treatment options. He exposes the cornea first to vitamin B2 eye drops and then to ultraviolet light—a treatment that causes tissue to harden and stops the progression of the disease. Manche is working with an early stage ophthalmic company to develop a more sophisticated procedure for treating these patients. He plans to launch a clinical trial soon. Being at Stanford ensures a smooth transition from technology development to clinical studies, and then to industry, he says.

"The most important part of my research is developing tools that help patients who have had less-than-optimal outcomes from previous surgical procedures," Manche says. "There are a lot of new exciting techniques and technologies I'll be working on over the next few years to help these patients."

Way



Edward Manche individualizes LASIK procedures with innovative technology

Close-knit &

Residents and faculty work together to achieve the highest standards

STANFORD OPHTHALMOLOGY RESIDENTS (LEFT TO RIGHT) SUZANN PERSHING, JONATHAN CRISS, NOT PICTURED: NORA LAD, MARCUS KO.

Stanford Ophthalmology places a strong emphasis on education. It has remained a small- to medium-sized department to focus on training the highest quality residents and medical students, with the goal of producing future generations of physicians who will abide by impeccable medical and ethical standards. Culled for not only their intellectual accomplishments, but also their character, the small class of residents embraces integrity, empathy, academic excellence and a strong work ethic.

Although recently the class size has increased, for many years only three residents were accepted each year into the program. The competition is stiff: hundreds apply, and each serious candidate is intensively interviewed by the department chair, program director, and faculty members on the selection committee. But once accepted, the residents join a friendly and harmonious environment.

They get close mentoring from top-notch research clinicians, such as eye surgeon Peter Egbert. “Residents are a top goal,” Egbert says. “We ensure that they are educated to live up to their full potential.” And they get access to three institutions: the Stanford University Medical Center, including the Stanford Hospital, Lucile Packard Children’s Hospital, and Stanford

Elite

ZAYNA NAHAS, LAUREN CROW, KIRANDEEP KAUR, ANTHONY LIU, JOHN YANG.

Clinics; the Veterans Administration Medical Center in Palo Alto; and the Santa Clara Valley Medical Center, the county hospital for San Jose. Thus, residents are exposed to a variety of patient populations within a major metropolitan area.

As part of their training, residents rotate through the pathology laboratory, which is a valuable resource within an ophthalmology department. In addition, they have access to clinics that specialize in the cornea and refractive surgery, cataracts, glaucoma, retinal disease, neuro-ophthalmology, and pediatrics, among other specialties. These resources allow residents to participate in the daily care of patients with complex eye diseases. Beyond hands-on clinical care, residents take classes, teach junior residents and conduct research.

"I'm proud of the teaching facilities and the residents we train," says Christopher Ta, an associate professor who directs the residency program. In the most recent academic year (2008-2009), Stanford residents were in the top 15th percentile nationally in surgical training. Those who wish to pursue a fellowship are able to secure their top choices of programs in subspecialty training.

Potential faculty and staff endure a strict vetting process as well. They must fill out a thorough application form and be personally evaluated by the department chair, Mark Blumenkranz. There were less than a handful of faculty in the department 25 years ago, and now there are 24 full-time faculty. "Mark has been very effective at bringing top-quality people to the department, and it has grown considerably under his time," Egbert says.

Recruiting high-caliber faculty and residents brings the department closer to its ultimate goal. "We hope to influence the current crop and future generations by developing a medical culture we can be proud of," Blumenkranz says. ❖

THE EYE INSTITUTE:

The Missing Link

Stanford Ophthalmology has distinguished itself for decades for its excellence in research, clinical care and training. It is a leading department that prides itself on developing technological innovations that bridge basic science with clinical impact. And the impact of the small but elite department is about to become greater, with the upcoming opening of the Eye Institute at Stanford in Palo Alto.

The Eye Institute will offer a dedicated physical space for the Department of Ophthalmology, its patients, residents and faculty. Currently, the department's teaching and clinical facilities are spread out across different locations on campus, including five eye centers and about a dozen specialty clinics. "The Eye Institute is the missing link," says Department Chair Mark Blumenkranz. "Stanford Ophthalmology has aspirations to be the best in everything it does, and to achieve that goal, we must have best-in-class facilities."

For the first time, the Eye Institute will unite all department specialties under one roof. The quality of diagnostic and therapeutic instruments will improve dramatically, and operating rooms will now be specialized for eye procedures. "It has been shown in multiple locations that single-specialty operating rooms function more efficiently and provide better outcomes than rooms that share staff and equipment," Blumenkranz says.

The state-of-the-art building will foster collaboration and improve patient care. A glaucoma specialist, for instance, will be able to refer patients to a cataract specialist down the hall for important clinical tests. "This type of collaboration among experts in all areas allows us to think about approaching diseases from different perspectives and therapeutic standpoints," says Joyce Liao, assistant professor of ophthalmology. Stanford is one of the major vision research centers, and with the addition of the new Eye Institute, it will be the premier place to have ophthalmic care, she says.

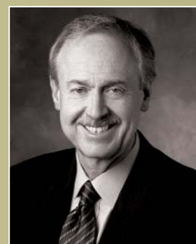
"We are just recovering from the shocks of the economic system, and it has been particularly challenging to develop the resources necessary to construct the new institute," Blumenkranz says. As the department has reached a critical mass of 12 residents and more than two dozen faculty, it is now at a pivotal point in its evolution, he says. "This is all part of Stanford continuing to move to the pinnacle of its peer group. To not move forward now would be to step backward." ❖

Our Faculty: Diverse and Talented

FACING THE FUTURE OF EYECARE AND VISION SCIENCE

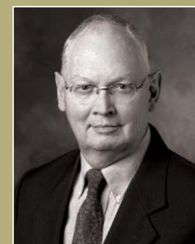
D. M. ALCORN, MD
Pediatric Ophthalmology, Genetic Disorders, and Pediatric Strabismus

STEPHEN BINDER, OD
Optometry

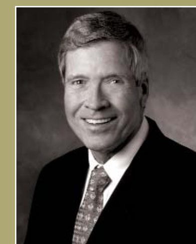


MARK S. BLUMENKRANZ, MD
Vitreoretinal Diseases and Macular Degeneration

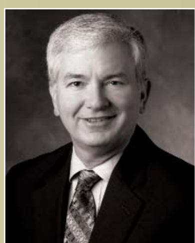
ROBERT CHANG, MD
Glaucoma



TALMADGE (TED) COOPER, MD
Neuro-ophthalmology and Comprehensive Ophthalmology



PETER EGBERT, MD
Cataract and Ocular Pathology



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RICHARD LIN, MD
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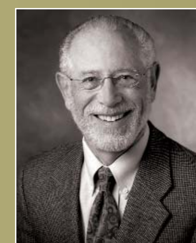

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ARTIS MONTAGUE, MD
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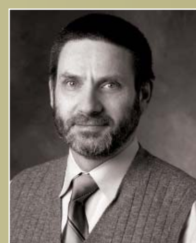

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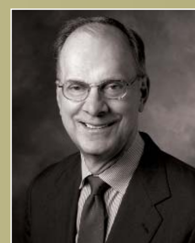

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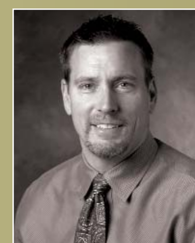
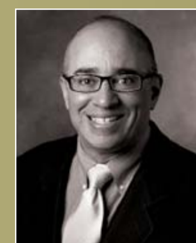
Vitreoretinal Diseases



STEVEN SANISLO, MD
Vitreoretinal Diseases



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Glaucoma

CHRISTOPHER TA, MD
Corneal Diseases

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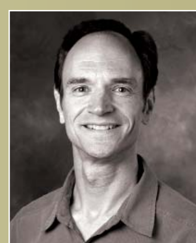

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BRIAN WANDELL, PHD
Ocular Cortical Visual Processing

KATHERINE WARNER, OD
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IRA WONG, MD
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Not Pictured: **BEN BARRES, PHD** (Ocular Neurobiology); **GLENN COCKERHAM, MD** (Corneal Diseases, Cataract and Ocular Pathology); **JAMES EGBERT, MD** (Oculoplastics and Pediatric Ophthalmology); **JOSEPH ELIASON, MD** (Corneal Diseases); **RAY GARIANO, MD** (Vitreoretinal Diseases); **EVA HEWES, MD** (Oculopastics and Comprehensive Ophthalmology); **ROBERT JACK, MD** (Vitreoretinal Diseases); **ABHA KUMAR, MD** (Corneal Diseases and Comprehensive Ophthalmology); **CARLA SHATZ, PHD** (Ocular Cortical Visual Processing); **GLORIA WANG, MD** (Glaucoma)

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