FOR SIGHT

Annual Report 2013

UC San Diego
SHILEY EYE CENTER

SIMPLY WORLD CLASS

The UC San Diego Department of Ophthalmology at the Shiley Eye Center is the only academic eye center in the region offering the most advanced treatments across all areas of eye care. Our world class clinicians, surgeons, scientists and staff are dedicated to excellence and providing the best possible patient care to prevent, treat and cure eye diseases. Our research is at the forefront of developing new methods for diagnosis and treatment of eye diseases and disorders. In addition to educating the leaders of tomorrow, we are committed to serving the San Diego and global community.

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A LETTER FROM OUR CHAIRMAN

ROBERT N. WEINREB, M.D.

Chairman and Distinguished Professor of Ophthalmology
Director, Shiley Eye Center
Director, Hamilton Glaucoma Center
Morris Gleich, M.D. Chair of Glaucoma

Colleagues, friends, alumni and supporters,

I am pleased to share highlights of the 2012-2013 year in this second Annual Report. We are proud to bring to you the achievements and news of our outstanding faculty, residents, fellows and staff, as well as their clinical contributions, research discoveries and service to the community and profession.

Patient Care
Ten of our full time clinical faculty were named to the U.S. News & World Report "Top Doctors" 2013 listing. All major specialties are represented among our faculty with several being recognized as being the top 1% in the nation.

Natalie Afshari, M.D., who joined our faculty this year, has established a new clinical program for patients with ocular surface disease.

Research
During the past year, many faculty received honors, awards and research grants. The Department's national ranking of total National Institutes of Health (NIH) research funding has risen from #12 to #7 (ranked by Blue Ridge Institute for Medical Research.)

With additional innovative research funded by non-governmental organizations and private donors, new research initiatives include our Ocular Biobank (Linda Zangwill, Ph.D. and Radha Ayyagari, Ph.D.), the Laboratory for Regenerative Ophthalmology (Jeff Goldberg, M.D., Ph.D.), and the Laboratory for Visual Performance (Felipe Medeiros, M.D., Ph.D.).

Napoleone Ferrara, M.D., a world-renowned scientist for his translational work with angiogenesis and macular degeneration, was appointed to our faculty.

At the 2013 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO), our Department had its most visible presence yet with over 66 presentations and posters from our faculty, residents and fellows.

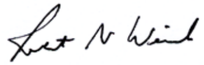
Education
We have accelerated our continuing medical educational offerings with a monthly Ophthalmology Community Lecture Series. Internationally renowned clinicians and scientists joined us monthly during the past year updating practitioners in San Diego and Imperial Counties on the latest in ophthalmic care.

In February, the Department hosted its annual "Ophthalmology Update" with 300 attendees. At the beginning of the weekend, a special Alumni Grand Rounds was held with the annual Stuart I. Brown Lecture delivered by Shiley Eye Center alumnus, Christopher Leung, M.D., Professor of Ophthalmology, Chinese University of Hong Kong.

Summary
At the Shiley Eye Center, we seek to cure and prevent blinding eye diseases through multi-disciplinary cooperation and teamwork in research, education, community service and clinical care.

With high expectations for preserving and improving the vision of our patients, we also are inspired by our aspirations for improving their lives.

On behalf of our team, I thank you for your generous support and encouragement.



Robert N. Weinreb, M.D.
Chairman and Distinguished Professor
of Ophthalmology
Director, Shiley Eye Center
Director, Hamilton Glaucoma Center
Morris Gleich, M.D. Chair of Glaucoma

NATIONAL EYE INSTITUTE GRANT TO STUDY GLAUCOMA IN AFRICAN-AMERICANS

Glaucoma is the leading cause of blindness in African-Americans. It is four to five times more likely to occur in persons of African descent, and up to 15 times more likely to cause meaningful visual impairment in this group compared to those of European descent.

A study led by Robert N. Weinreb, M.D., Chairman and Distinguished Professor of Ophthalmology at the Shiley Eye Center, received $6.4 million in grant funding over five years from the National Eye Institute (NEI) beginning in 2013, to study the relationship between genetics and progression of glaucoma in persons of African descent.

Dr. Weinreb has teamed with Jerry Rotter, M.D., Distinguished Professor of Pediatrics, Medicine and Human Genetics at Harbor-UCLA Medical Center, a renowned genetics expert, to identify glaucoma genes in this high-risk, minority population. Its aim is to develop predictive models for glaucoma diagnosis and progression, as well as the discovery of new drug targets for therapies to reduce the visual impact of glaucoma blindness.

"A better understanding of how genetics influences the rate of worsening of glaucoma is needed to better manage and prevent blindness in this high-risk group," stated Linda Zangwill, Ph.D., Professor of Ophthalmology at the UC San Diego, and co-investigator of the study.

In addition to the research conducted at the Shiley Eye Center, the recruitment, enrollment and phenotyping will take place at the New York Eye and Ear Infirmary (Jeff Liebmann, M.D.), a private practice in Atlanta and the University of Alabama at Birmingham (Christopher Girkin, M.D., M.S.PH.)

NEW VISUAL PERFORMANCE LABORATORY AT SHILEY

A state-of-the-art Visual Performance Laboratory is being created at the Department of Ophthalmology of the University of California San Diego (UCSD). "The Visual Performance Lab will provide a clinical research environment to promote a comprehensive assessment of functional performance in different ophthalmic conditions", said Felipe Medeiros M.D., Ph.D., Professor of Ophthalmology at UCSD and Director of the Laboratory. "It is essential that we understand how our patients are affected in their abilities to drive, walk, read or perform other everyday activities. This will help us develop strategies for prevention and rehabilitation", said Dr. Medeiros.

"The Visual Performance Lab will provide a clinical research environment to promote a comprehensive assessment of functional performance in different ophthalmic conditions"

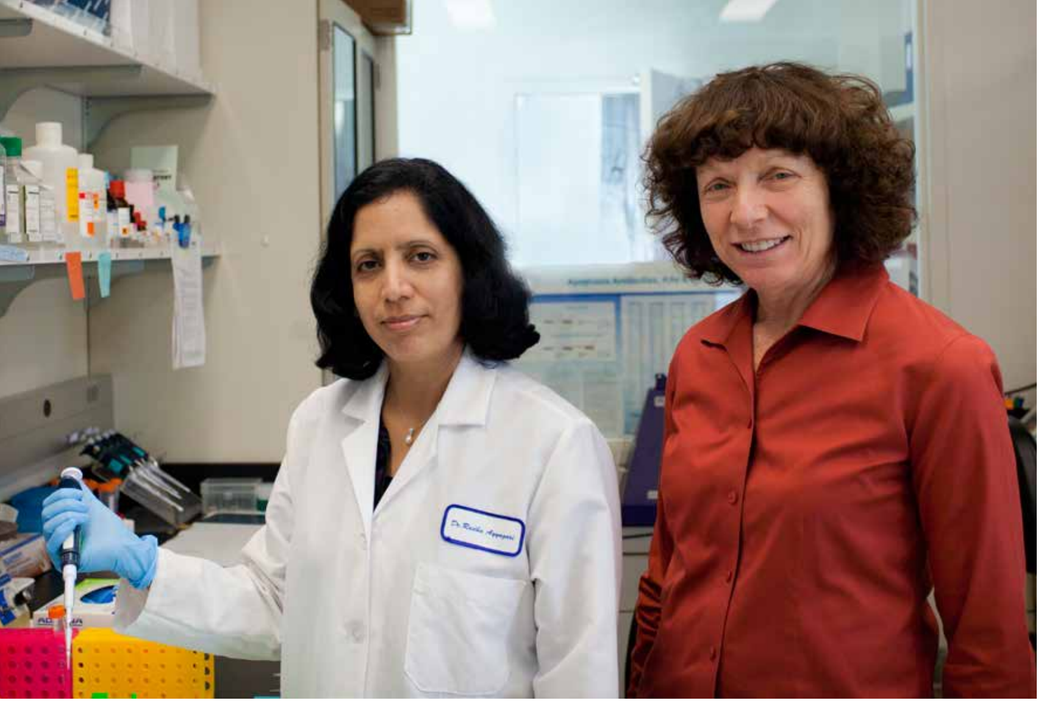
- Dr. Felipe Medeiros

Most ocular diseases can impair the ability to drive. The laboratory currently houses an open-cockpit simulator for driving assessment, but is expanding soon into a high-fidelity full cab simulator that will help researchers understand how different eye conditions affect the ability to drive under realistic scenarios, such as night driving, or to simulate challenging situations such as glare. In addition to driving assessment, the laboratory will house a 3-dimensional CAVE, an immersive virtual reality environment where patients will be able to perform several tasks designed to replicate daily activities. "The 3D virtual reality environment allows us to perform controlled experiments that will provide insight into how patients and healthy subjects perform daily activities, such as visual search", Dr. Medeiros said. By incorporating devices able to monitor eye movements, known as eye-trackers, the laboratory will also allow researchers to investigate adaptation mechanisms employed by patients under different conditions of visual function loss.

As part of his research in the laboratory, Dr. Medeiros has recently been selected as a "Google Developer", and has been given the opportunity to work with the Google Glass before it is available for public use. "The Google Glass is an innovative and exciting device that will allow us to study visual function within a mobile platform", he says. "Linking the visual stimuli presented by the Google Glass with objective ways to monitor brain function, such as electroencephalogram (EEG), can potentially give us new ways to monitor visual impairment at distance without the need for patients to come to the office for testing. This would be truly revolutionary", he adds. In this endeavor, Dr. Medeiros has partnered with Scott Makeig and Tzyy Ping Yung, Director and Associate Director, respectively, of the Swartz Center for Computational Neuroscience at UCSD.

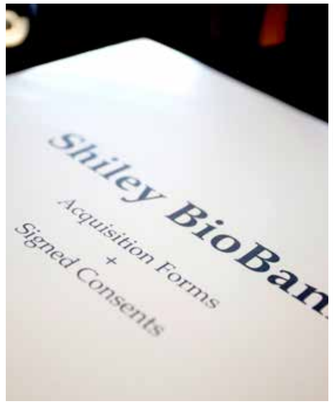
The Performance lab will be available for cross-specialty studies, with the goal of conducting studies and clinical trials in glaucoma, retina, neuro-ophthalmology, pediatrics, cornea and oculoplastics. "Dr. Medeiros' research is unique and transformative and directly benefits our patients. The substantial array of technologies housed in his laboratory is an extraordinary resource for researchers at UCSD and their collaborators from throughout the world," said Robert N. Weinreb, M.D., Chairman and Distinguished Professor of Ophthalmology.

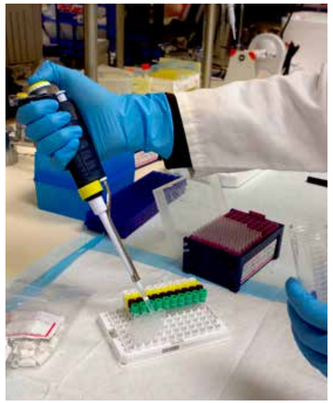
(above) **Dr. Medeiros conducting experiments using the eye tracking and virtual reality at the new Visual Performance Laboratory**



SHILEY EYE CENTER BIOBANK

A KEY TO PRESENT AND FUTURE RESEARCH TO PREVENT BLINDNESS





Remarkable progress has been made in the past few years in the field of ophthalmology. These advances include development of novel tools for phenotype evaluation, identification of more disease causing genes, better understanding of pathology, and the development of new treatments including gene therapy and design of drug delivery modalities. All of these call for further research and integration of research results into clinical practice to enable better patient care and prognosis.

The recent surge in biological sample banking is partially due to the advances in understanding the biology of diseases and the promise of personalized medicine. The addition of new bioinformatics technologies and the availability of next-generation sequencing tools, as well as development of new treatments and therapeutic methods through genomic medicine, have drawn attention to “Biobanking”, enabling researchers to readily utilize advances in the field.

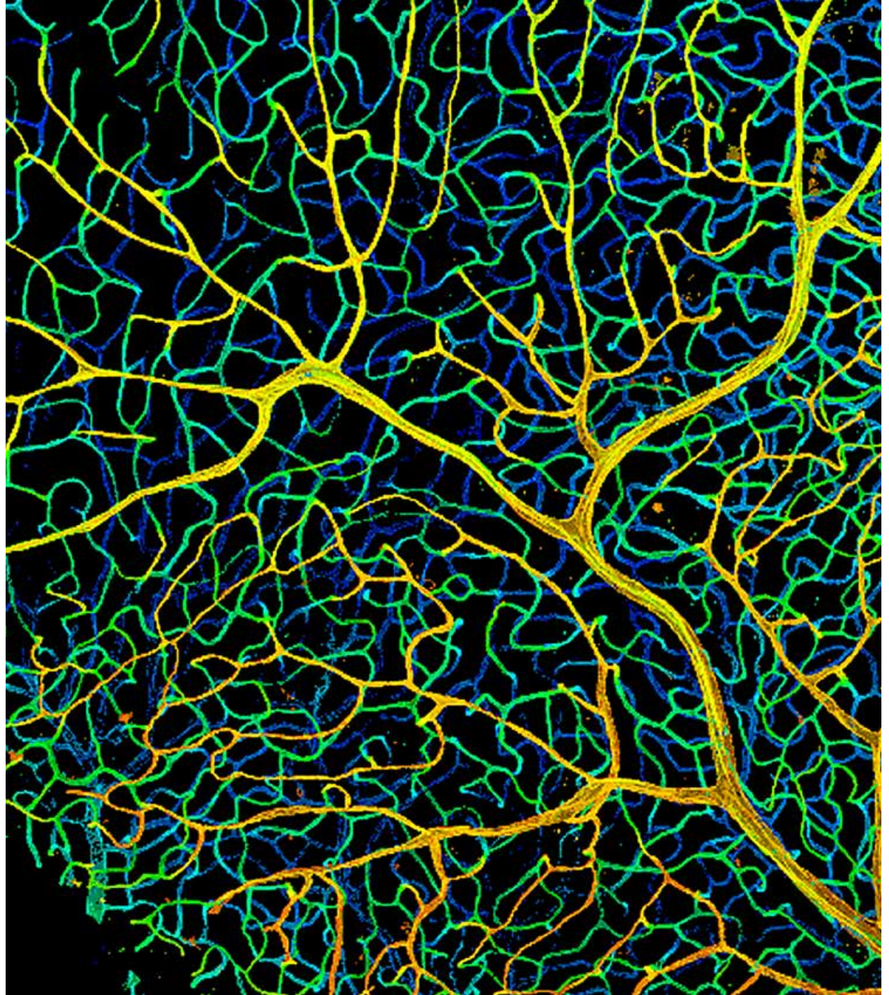
Under the direction of Radha Ayyagari, Ph.D., Associate Professor of Ophthalmology, and Linda Zangwill, Ph.D., Professor of Ophthalmology, the Shiley Eye Center initiated its BioBank last year with the goals of building a resource of readily available biological samples, with complete medical and family history and demographic information to accelerate research to prevent blindness. The staff of the BioBank has been collecting blood, tissue, and biological fluid samples from patients with ophthalmic diseases. In addition, sophisticated methods are employed to derive induced pluripotent stem cells from specific individuals for storage in the BioBank.

These samples will be utilized to learn about predictors of diseases (biomarkers), effectiveness or lack of effectiveness of therapies, understand disease pathologies and developing effective therapies.

According to Dr. Ayyagari, “Within the Shiley BioBank, the entire process of banking the collected data and physical samples has been streamlined utilizing a systematized and state-of-the-art secure electronic database with tools.” Demographic, ethnic, medical and risk factor history data are collected from patients on iPads; details of sample collection, processing, analysis and exact freezer storage location of samples are recorded in the BioBank database system. Each step of the process ensures that all patient data and samples are stored, tracked, and readily available to share with investigators, along with all linked clinical, demographic, genotype, and phenotype information while maintaining strict confidentiality protocols. The protocol that has been approved by the UCSD Institutional Review Board Committee includes all activities including the sample collection, sample processing and intended use and handling protocol.

The Shiley Eye Center BioBank will serve as a reference library for each patient. With readily available sample collection, it presents numerous opportunities for investigators to analyze existing data and conduct additional studies based on the most recent scientific knowledge. Robert N. Weinreb, M.D., Director of the Shiley Eye Center, believes that “In the future, the BioBank will enable investigators to learn about predictors of eye disease, treatment effectiveness and disease pathology, as well as provide critical new information for developing innovative treatments to prevent and cure blindness of macular degeneration, glaucoma and other blinding eye diseases.”

NEW TREATMENTS
FOR MACULAR DEGENERATION



Angiogenesis involves the growth of new blood vessels, a process elemental to developing and sustaining life and health. But there's a dark side as well: some cancers exploit angiogenesis to feed tumors and spread disease. The phenomenon is not limited to just cancer.

Age-related macular degeneration (AMD) is the leading cause of blindness in older adults. There are two forms: "Dry" occurs slowly over time as portions of the retina atrophy. "Wet" is less common, but far more devastating. It is caused by abnormal, leaky blood vessel growth. While less than 20 percent of AMD cases are wet, they account for 80 to 90 percent of severe vision loss. Each year, roughly 200,000 new cases of wet AMD diagnosed in the United States.

Both growing cancer tumors and wet AMD rely upon angiogenesis, but it was not until the 1990s and research by Napoleone Ferrara, M.D., that science was able to pinpoint the "X factor" that drives vascular growth, providing for the first time a therapeutic target for both cancer and AMD.

Dr. Ferrara was appointed during the past year as a Distinguished Professor of Ophthalmology and Pathology at the UC San Diego School of Medicine as well as the senior deputy director for basic science at UC San Diego Moores Cancer Center. In the 1980s, Ferrara, who had trained at the University of Catania Medical School in Italy, was working as a postdoctoral fellow at the UC San Francisco Medical Center, when he identified a protein that selectively promoted the growth of vascular endothelial cells – the cells that line the entire circulatory system, from the heart to the smallest capillaries. In 1988, he joined the South San Francisco-based biotechnology company Genentech. Ferrara and his colleagues at Genentech were able to isolate and clone this angiogenic molecule and termed it "vascular endothelial growth factor" or VEGF.

The discovery of VEGF proved a monumental advance. Since the protein was vital to growing blood vessels, researchers theorized that blocking the function of VEGF might deny tumors and wet AMD the sustenance needed to grow and spread. Ferrara and colleagues followed up with development of a humanized anti-VEGF antibody, the basis of the drug bevacizumab (Avastin), which has been approved for treatment of some forms of colorectal, lung and renal cancer, and subsequently used by ophthalmology for treating AMD and other retinal vascular diseases.

He also was focused on AMD, developing in his lab another anti-VEGF antibody fragment called ranibizumab (Lucentis) as a potential therapy for wet AMD. In 2006, the therapy was approved after multiple clinical trials showed substantial visual acuity gains in patients with severe cases. Ranibizumab has since been approved for treating retinal vein occlusion and diabetic macular edema as well as wet AMD.

"This work has been extremely gratifying," said Ferrara, who continues to pursue AMD studies at the UC San Diego Shiley Eye Center. "I'm humbled by the magnitude of the benefit, particularly the improved vision in patients, which exceeded my expectations, considering that previous treatments only slowed down the rate of vision loss."

In 2010, Dr. Ferrara won the prestigious Lasker-DeBakey Clinical Medical Research Award, often called the American Nobel Prize, for the discovery of VEGF as a major mediator of angiogenesis and the development of an effective anti-VEGF therapy for wet AMD. Most recently in February of this year, he received the inaugural Breakthrough Prize in Life Sciences for his discoveries in the basic mechanisms of angiogenesis that led to novel therapies for cancer and eye diseases.

(middle) **Retina vessels, courtesy of I. Kasman and W. Ye, Genentech**

SHILEY DOCTORS SAVE PITCHER'S EYE

Cadhan Brown has always loved baseball. He is considered one of the top young prospects in all of San Diego County. As a thirteen year old, he pitches up to 75 mph as well as playing 1st and 3rd base. He is the starting pitcher for the Encinitas Little League All Stars. In 2011 and 2012, he led the Encinitas Little League in home runs and was the Home Run Derby Winner in 2012. Despite the hours he spends each day practicing, Cadhan carries a 4.0 GPA, and was named Encinitas Chamber of Commerce Student of the year. Even more amazing, is that Cadhan is a type I diabetic and manages to compete at such an elite level in his sport.

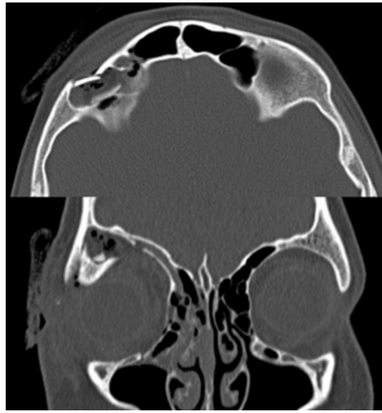
Despite playing multiple positions, Cadhan's love is pitching and dreams of one day pitching in the major leagues. All of this came to a sudden halt in early 2013. In less than a second, the average time it takes a baseball to reach the pitcher's mound after the batter strikes the ball, Cadhan was struck in the eye socket by a line drive. Worried about their child, loss of his budding baseball career and worse yet maybe even blindness, Cadhan's parents searched for a place they could get help. Hours from home they came down the freeway and started making phone calls. He was rushed to see David B. Granet, M.D., Director of the Ratner Children's Eye Center at the Shiley Eye Center. Hearts pounding the family was relieved that his eye was ok after Dr. Granet's examination. However, a CT scan showed the baseball had shattered the majority of the bones in Cadhan's eye socket (orbit). The fracture also involved the upper wall of the orbit with a bone fragment just millimeters away from entering Cadhan's brain. To compound matters, the injury was causing restricted eye movements and left him with double vision.

Dr. Granet immediately brought Cadhan over to the adjacent Shiley Eye Center to see Bobby Korn, M.D., Ph.D., Associate Professor of Clinical Ophthalmology in the Ophthalmic Plastic and Reconstructive Surgery Division. Dr. Korn reviewed Cadhan's CT scans. Their stomachs ached when Dr. Korn talked about Cadhan's shattered orbit. Would he ever be normal again? Could he drive? Go to school? Ever play baseball? Calmly Dr. Korn discussed all of the options. Almost certainly they included bone work to piece together the orbit and likely eye muscle surgery. In the operating room, Dr. Korn meticulously realigned all the bone fragments and covered each of the fractures with implants and screws while protecting his brain and sinuses. In the end, he was able to piece together this complex orbital jigsaw puzzle and return the eye to full movement.

Initially, Cadhan had significant edema at the surgery site and still had double vision. But with each passing day, his swelling started to resolve and his eye movements continued to improve. Amazingly eye muscle surgery to get rid of double vision was not needed and Cadhan's eye healed beautifully. At two months out, Drs. Korn and Granet gave Cadhan the clearance to start baseball practice again and he hasn't looked back since! "We are eternally grateful of the care given to Cadhan by Dr. Korn and Dr. Granet," said his parents.

This accident brings awareness to the importance of using protective eye gear by children and adults as standard equipment for a variety of sports activities. According to the National Eye Institute (NEI), most sports-related eye injuries can be avoided with the use of protective eyewear such as safety glasses and goggles, safety shields, and eye guards for a particular sport. Ordinary prescription glasses, contact lenses and sunglasses do not protect against eye injuries. Safety goggles should be worn over them.

At the Shiley Eye Center, ophthalmic subspecialists are all housed in one complex. "The beauty of this place is that we have world-class eye doctors right next to each other. Our patients receive the benefit of a team of multiple ophthalmic specialists putting their heads – and hands – together," said Dr. Granet. "That teamwork, on the field or in medicine, produces the best results" continued Granet. Collaboration amongst physicians in all of the ophthalmic divisions is a hallmark of the Shiley Eye Center and enables our patients to receive the highest level of care.



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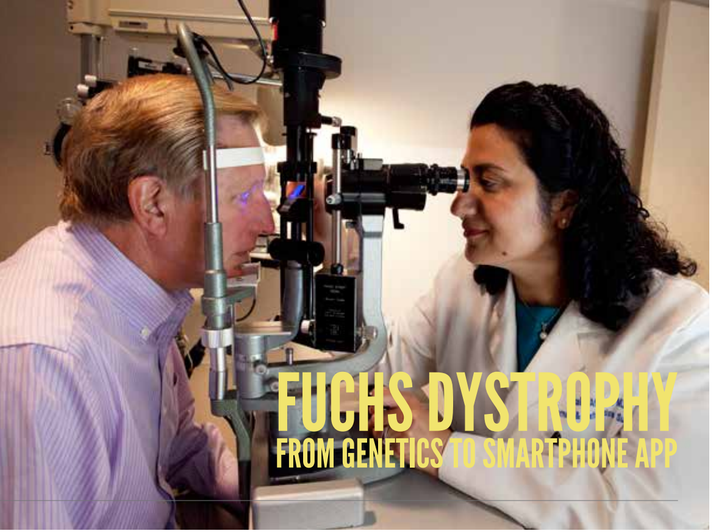


FUCHS DYSTROPHY
FROM GENETICS TO SMARTPHONE APP

Lester Briney is a successful engineer and entrepreneur. He has his own company and is Chief Technology Officer (CTO) of another. His work was getting harder because his vision steadily declined over a decade. The truth is that he has Fuchs Corneal dystrophy, a degeneration of the inner cell layer of the cornea (the clear tissue in the front of the eye). As the CTO of a company developing video technology, this made it difficult to see if the product was functioning well or not. Working in the mornings soon became impossible because this was the time when his eyesight was at its worst. He could not drive to work until noon. His failing eyesight was not only a difficulty in his work, but a detriment to his life. As if it was not bad enough, the additional progression of cataracts nearly put his eyes out of commission.

He decided it was time to get to the bottom of his vision decreasing. Being an engineer, he knew the importance of seeking expert advice. He took to the Internet in search of help. He soon found Natalie Afshari, M.D., known for her research in Fuchs endothelial corneal dystrophy and clinical care of patients afflicted with it. At the time of his research, Dr. Afshari had just been recruited to the UC San Diego Shiley Eye Center from Duke University where she was Professor of Ophthalmology. Soon after walking into her new Shiley Eye Center office last fall, she opened a letter already on her desk from Mr. Briney. Three days later, they were scheduling his first appointment.

Dr. Afshari, as the new Chief of Cornea and Refractive Surgery and Professor of Ophthalmology, checked his eyes during different times of the day and noted a significant difference. It was clearly time to plan for DSAEK (Descemet's automated endothelial keratoplasty) surgery, which is a partial thickness corneal transplant surgery. Mr. Briney was unsure about having surgery but he had faith in Dr. Afshari. To his relief, the surgery was painless and successful. After his surgery, he opened his eyes to see the world as though it was in "high definition." Mr. Briney admitted, "I was postponing this surgery because I didn't know what to expect, but I was pleasantly surprised and very glad to finally see clearly."

"I was postponing this surgery because I didn't know what to expect, but I was pleasantly surprised and very glad to finally see clearly."

- Lester Briney

Fuchs endothelial corneal dystrophy is one of the leading reasons for ~ 40,000 corneal transplants that are performed annually in the United States. It causes decreased vision as a result of endothelial cell loss and corneal swelling. Cornea endothelial cells, comprising the innermost layer of the cornea, are cells that pump fluid out of the cornea and keep it clear. A significant reduction in the endothelial cell density results in insufficient pump function required for the cornea to stay clear and dehydrated. This causes the cornea to become swollen, compromising transparency, and leading to a decrease in visual acuity.

FUTURE THERAPY

Dr. Afshari has been studying the genetics of Fuchs Corneal Dystrophy for over a decade and has collected over 1500 patients' DNA sample with this disease. With colleagues, great strides have been made in pinpointing areas of the genome responsible for this disease. They have also been developing new options for treatment of Fuchs Endothelial Dystrophy. Her colleagues Dr. Shigeru Kinoshita and Dr. Noriko Koizumi from Kyoto, Japan have worked on a type of molecule called ROCK inhibitor as a potential agent for division of the corneal endothelial cells. Dr. Afshari has also worked on developing eye drop medications as opposed to surgical treatment for Fuchs corneal dystrophy. Topical administration of ROCK inhibitors in animals has demonstrated marked reduction of corneal swelling in treated eyes. "For the future, my hope is to treat patients that have Fuchs with eye drops rather than surgery. I believe this is achievable very soon" says Dr. Afshari.

"Dr. Afshari's research on Fuchs represents some of the most important opportunities to make advances both in our fundamental understanding of corneal diseases, as well as in bringing new treatments forward" says Jeffrey Goldberg, M.D., Ph.D., Director of Research and Professor of Ophthalmology at the Shiley Eye Center.

HOW DOES ALL OF THIS RELATE TO SMARTPHONES?

Most recently, Dr. Afshari and her team have developed a smartphone application to be utilized by physicians for predicting the refractive shift (correction needed with eye glasses or lens implant) in patients' eyes after DSAEK. Although this surgery often produces excellent visual outcomes and rapid recovery, patients also commonly experience some change in refraction in the transplanted eye - usually becoming slightly more far-sighted. Recently, Dr. Afshari developed a mathematical model and formula for predicting this change in vision after DSAEK surgery based on measurements of the patient's eye and the transplant tissue made before surgery. Because this formula is cumbersome to calculate manually, she and her team developed a smart phone application to allow corneal surgeons to select the optimal lens implant for clearest vision. Smartphones are everywhere, even in the operating room these days. "I hope that our smartphone App helps accuracy of surgical outcomes for patients around the world" says Dr. Afshari.

In each version of the application, the user will be asked to input the patient's preoperative central corneal thickness in micrometers, the patient's preoperative posterior radius of curvature in millimeters, the corneal transplant's central graft thickness in micrometers, and finally the corneal transplant's graft central-peripheral thickness ratio in order to calculate the post-DSAEK refractive shift.

(right top) **Figure 1: Published in Investigative Ophthalmology and Visual Science (Refractive changes after descemet stripping endothelial keratoplasty: a simplified mathematical model. Hwang RY, Gauthier DJ, Wallace D and Afshari NA.)**

(right bottom) **Figure 2: iPhone Application for Physicians**

MATHEMATICAL ALGORITHM FOR THE SMARTPHONE APPLICATION TO PREDICT POST-DSAEK REFRACTIVE SHIFT

Figure 1

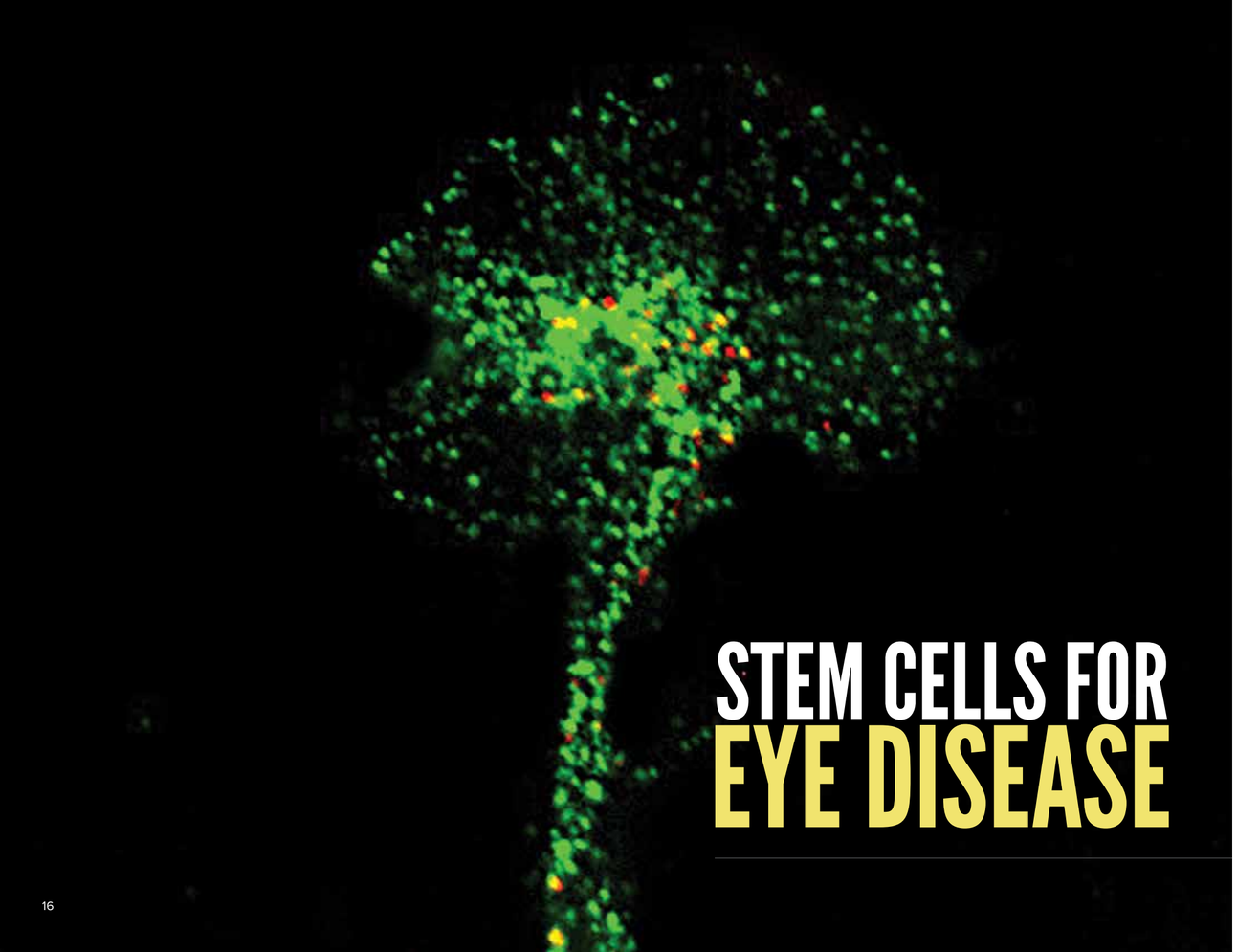
$$ic = \frac{n_2 - n_1}{r_{ac}} \qquad F_{pc+DSEK} = \frac{n_2 - n_2}{r''_{pc}} = \frac{n_2 - n_2}{\dfrac{1}{\dfrac{1}{r_{pc} - t_{transplant}} + \dfrac{2 * t_{transplant}\left(\frac{1}{C_n} - 1\right)}{h'^2}}}$$

$$F_{cornea+DSEK} = F_{ac} + F_{pc+DSEK} - \left(\frac{t + t_{transplant}}{n_2}\right)(F_{ac})(F_{pc+DSEK}) \qquad d = 0.005678 - 1 * \frac{n_2 * (t + t_{transplant})}{n_2 * F_{cornea+DSEK}}$$

$$F_{eye+DSEK} = F_{cornea+DSEK} + F_{lens} - \frac{d}{n_2}(F_{cornea+DSEK})(F_{lens})$$

$$Refractive\ shift = F_{eye+DSEK} - F_{eye\ without\ DSEK}$$

Figure 2



STEM CELLS FOR EYE DISEASE

Jeffrey L. Goldberg, M.D., Ph.D., who joined the UC San Diego Shiley Eye Center faculty in November 2012 as Professor and Director of Research in the Department of Ophthalmology, is directing two exciting research programs. Each has great potential to restore vision to those who have lost their sight, and are funded by both the National Eye Institute and by private donations.

One program involves developing regenerative therapies for glaucoma and other diseases of the optic nerve, like ischemic optic neuropathy (optic nerve stroke) or optic neuritis. In these diseases, optic nerve fibers that carry visual information from the eye to the brain are damaged. Normally there is no regenerative response—that is why the vision loss in glaucoma and other diseases has always been thought to be permanent.

"The idea of restoring vision in glaucoma is captivating and very motivating," Dr. Goldberg says. "We see so many patients with advanced disease and significant vision loss. Of course, there are too many more at risk of decline." Dr. Goldberg's group has been studying a recently discovered family of genes and proteins, the Kruppel-like transcription factors and their signaling partners, that control regeneration. They have discovered that increasing one or decreasing another can promote regeneration in experimental models of optic nerve degeneration.

The second program is designed to harness the potential of stem cell therapies for the eye. His group is studying how to replace degenerating retinal cells, particularly the rods and cones (photoreceptors) in macular degeneration, and the retinal ganglion cells in glaucoma, with cell replacement therapies. Although not yet ready for testing in patients, they have developed a number of innovative and potentially promising strategies for cellular regeneration. The first involves harvesting a patient's adult retinal stem cells from their peripheral retina, growing them in the laboratory and reimplanting them back into the patient as retinal neurons (nerve cells).

Another approach involves turning stem cells into retinal neurons—his team uncovered a new set of molecules that controls how stem cells turn into retinal ganglion cells. According to Robert N. Weinreb, M.D., Director of the Shiley Eye Center, "Dr. Goldberg and his team enhance the ability of turning stem cells into retinal neurons that need replacing. As a result, it is expected that patient treatments to rescue and restore vision will be improved."

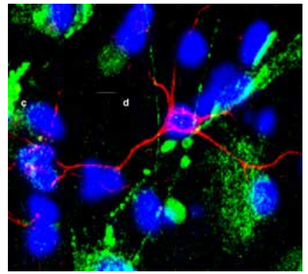
Dr. Goldberg is optimistic and hopes to move these advances from the laboratory into clinical trials for patients. "We and others have developed good candidates that work well in the laboratory, and plan to move toward human testing in the near future," Dr. Goldberg added.

(left) **Novel nanoparticle based therapeutics are being tested for their ability to enhance optic nerve regeneration in glaucoma and other optic neuropathies.**

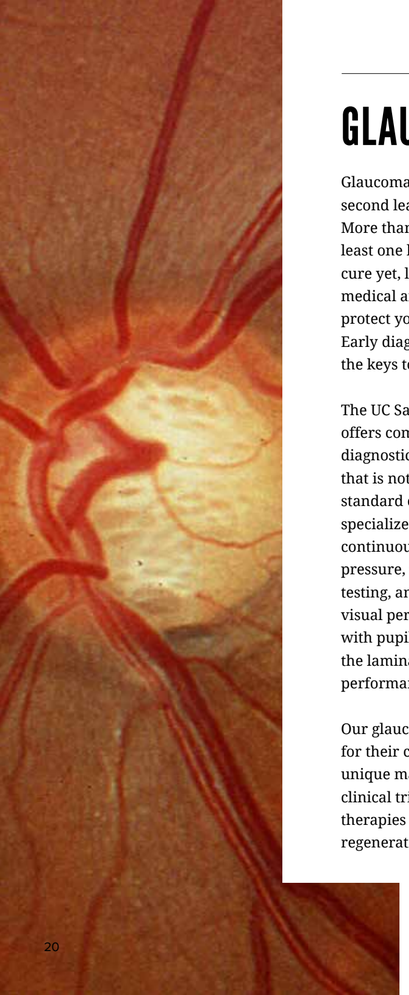
(right top) **Retinal progenitor stem cells can be induced to differentiate into mature retinal ganglion cell like neurons that may prove valuable in developing new treatments for glaucoma.**

"The idea of restoring vision in glaucoma is captivating and very motivating,"

- Dr. Goldberg



DEPARTMENT OF OPHTHALMOLOGY



GLAUCOMA

Glaucoma can cause blindness if untreated and is the second leading cause of blindness in the United States. More than 3 million Americans have glaucoma and at least one half do not know it. Although there is no cure yet, loss of vision can be slowed or halted with medical and/or surgical treatment. The best way to protect your sight from glaucoma is to get tested. Early diagnosis and appropriate treatment are the keys to preserving vision.

The UC San Diego Hamilton Glaucoma Center offers comprehensive and unparalleled glaucoma diagnostic services with unique instrumentation that is not yet available anywhere else. In addition to standard optic nerve imaging and functional testing, specialized programs are available including continuous measurement of 24 hour intraocular pressure, a dedicated sleep unit for glaucoma testing, anterior segment imaging, a dedicated visual performance laboratory, objective perimetry with pupillometry, swept source OCT for imaging of the lamina cribosa and choroid as well as a visual performance laboratory with a driving simulator.

Our glaucoma specialists are world renowned for their clinical and research excellence and offer unique management programs for glaucoma through clinical trials and innovative medical and surgical therapies that include genetic testing and regenerative ophthalmology.

Robert N. Weinreb, M.D.

Chairman & Distinguished Professor of Ophthalmology
Director, Shiley Eye Center
Director, Hamilton Glaucoma Center
Morris Gleich, M.D. Chair of Glaucoma

Medical School
Harvard Medical School

Residency
University of California, San Francisco

Fellowship
University of California, San Francisco

Certification
Board Certification in Ophthalmology

Special Interests
Glaucoma surgery; Optic neuropathy and the aging eye; Uveoscleral outflow; Imaging of optic disc and nerve fiber layer; Mechanisms of optic nerve damage; Neuroprotection in glaucoma; Drug delivery; Cataract surgery

Notables
2012, 2013 US News and World report Top Doctors (Top 1%); 2012, 2013 Cited in Woodward/White Best Doctors in America; 2012, 2013 Honorary Professor, Chinese University of Hong Kong; 2013 Advisory Board, State Key Laboratory in Ophthalmology, Sun Yat-Sen University, Guangzhou; 2013 President, Pan American Glaucoma Society; 2013 Innovators Award, American Glaucoma Society; 2013 Visiting Professor, Huazhong University of Science and Technology, Wuhan, China (2013-2016); 2012, 2013 President, American Glaucoma Society Foundation; 2013 Honorary Member, Societe Francaise D'Ophtalmologie; Heed Ophthalmic Foundation Award; Past-President, Association for Research in Vision and Ophthalmology; Past-President, World Glaucoma Association; Ridley Medal; Past-President, American Glaucoma Society; Adjunct Professor, Chinese University of Hong Kong; Moecyr E. Alvaro Medal; Ronald Lowe Medal; World Glaucoma Association Founders Award; Leydhecker-Harms Medal; Lifetime Achievement Award American Academy of Ophthalmology; Watson Medal of Cambridge University;

Felipe A. Medeiros, M.D., Ph.D.

Professor of Clinical Ophthalmology
Medical Director, Hamilton Glaucoma Center

Medical School
University of Sao Paulo

Residency
University of Sao Paulo

Fellowship
University of California, San Diego

Certification
Board Certification in Ophthalmology

Special Interests
Challenging glaucoma cases and new surgical procedures; Cataract surgery; Advanced imaging analysis for diagnosis and detection of glaucoma progression; New techniques for intraocular pressure measurement; Functional impairment in glaucoma; Prediction models and risk assessment in glaucoma

Notables
2013 Best Doctors in America; 2013 Loris and David Rich Lecture, University of Alabama; 2013 South African Glaucoma Society Honorary Member; 2012 Iranian Society of Ophthalmology Recognition Award; 2012 Federal University of Sao Paulo Special Recognition Award; 2012 American Academy of Ophthalmology (AAO) Glaucoma Subspecialty Day Planning Group; 2012 Member of the AAO BSCS Committee; 2012 Member of the Research Committee, American Glaucoma Society; World Glaucoma Association Research Award; Ronald Lowe Medal; American Glaucoma Society Mid-Career and Clinician Scientist Awards; Achievement Award American Academy of Ophthalmology; World Health Organization (WHO) Committee for Prevention of Glaucoma Blindness; Member, Glaucoma Research Society

Jeffrey L. Goldberg, M.D., Ph.D.

Professor of Ophthalmology
Director of Research, Shiley Eye Center

Medical School
Stanford Medical School

Residency
Bascom Palmer Eye Institute

Fellowship
Bascom Palmer Eye Institute

Certification
Board Certification in Ophthalmology

Special Interests
Glaucoma surgery; Cataract surgery; Neuroprotection and regenerative ophthalmology; Stem cell and tissue engineering; Nanotechnology

Notables
2012 Lois Pope Life Fellows Research Award; 2012 Society for Advancement of Chicanos and Native Americans in Science Travel Award; 2012-13 American Society of Cataract and Refractive Surgery Award; 2012 Vanderbilt Symposium Travel Award; 2012 Margaret Whelan Scholarship Fund Travel Grant; 2012 Carl and Barbara Alving Award, Eastern Atlantic Student Research Forum, "Most Outstanding Research Achievement for the Year"; 2013: University of Illinois Chicago, Cless "Best of the Best" Award; 2012: ARVO Cogan Award; Hope for Vision Scientist of the Year; Association for Research in Vision and Ophthalmology David G. Cogan Award; American Society for Clinical Investigators; Research to Prevent Blindness Walt and Lilly Disney Award; Heed Ophthalmic Foundation Fellowship Award; Association of University Professors of Ophthalmology Research Forum Winner; Thermo Fisher Cellome Award; Best Housestaff Teaching Award

Christopher Bowd, Ph.D.

Research Scientist of Ophthalmology
Director, Center-based Visual Field Assessment Center
Co-Director, Center-based Imaging Data Evaluation and Analysis (IDEA) Center

Graduate School
Washington State University

Postdoctoral Fellowship
University of California, San Diego

Special Interests
Early detection and monitoring of glaucoma; Machine learning classifier analyses of imaging and visual function measurements

Andrew D. Huberman, Ph.D.

Assistant Professor of Neurosciences/ Neurobiology/Ophthalmology

Graduate School
University of California, Davis

Postdoctoral Fellowship
Stanford University School of Medicine

Special Interests
Retinal development and retinal ganglion cells

Notables
Pew Biomedical Scholar Award (2013-2016); McKnight Neuroscience Scholar Award (2013-2015)

Won-Kyu (Daniel) Ju, Ph.D.

Associate Professor of Ophthalmology

Graduate School
The Catholic University in Korea (Masters & Ph.D.)

Postdoctoral Fellowship
Washington University in St. Louis
Sanford-Burnham Medical Research Institute

Special Interests
Mechanisms for neuroprotection and neurodegeneration in glaucoma; Oxidative stress and glutamate excitotoxicity in glaucoma; Mitochondrial dynamics, bioenergetics and dysfunction in retinal ganglion cell (RGC) and optic nerve head (ONH) astrocyte in glaucoma; Mitochondria-related gene therapy for RGC and ONH astrocyte neuroprotection in glaucoma

James D. Lindsey, Ph.D.

Adjunct Professor of Ophthalmology

Graduate School
University of California, San Diego

Postdoctoral Fellowship
University of California, San Diego

Special Interests
Biology of optic nerve, experimental models of glaucoma, and aqueous humor dynamics

Notables
Outstanding Poster Presentation, World Glaucoma Congress, Vienna, Austria

John H.K. Liu, Ph.D.

Adjunct Professor of Ophthalmology
Director, Glaucoma Molecular Pharmacology Laboratory

Graduate School
National Tsing Hua University
(M.S. Molecular Biology)

Texas A&M University
(Ph.D. Pharmacology)

Postdoctoral Fellowship
Harvard Medical School

Special Interests
Regulation of intraocular pressure and ocular blood flow; 24-hour sleep laboratory for glaucoma and other eye diseases

Peter Rosen, M.D.

Associate Clinical Professor of Ophthalmology

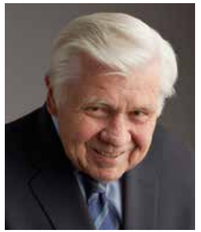
Medical School
SUNY Downstate Medical Center

Residency
Manhattan Eye, Ear & Throat Hospital, Cornell University

Certification
Board Certification in Ophthalmology

Special Interests
Establishing the connection between visual performance and task performance in all areas of eye disease; Psychophysics of visual performance; Use of the driving simulator as a methodology for evaluation on the relationship between visual performance and task performance; Connection between visual performance and task performance in all areas of eye disease; Psych-physics of visual performance; Use of driving simulator as a methodology for evaluation on the relationship of visual performance and task performance

Notables
Outstanding Physician Award



Rigby Slight, M.D.

Associate Clinical Professor of Ophthalmology

Medical School
University of Oklahoma; Internship at UCLA

Residency
University of Southern California

Certification
Board Certification in Ophthalmology

Special Interests
UCSD sleep study comparing the effects of investigational eye drops; UCSD Diagnostic Innovations in Glaucoma Study; Clinical research in glaucoma; UC San Diego Optic Disc Reading Center

Linda Zangwill, Ph.D.

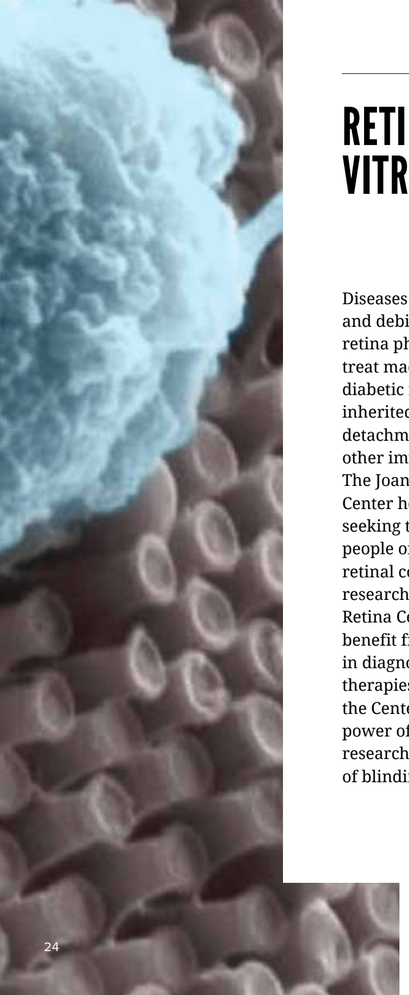
Professor of Ophthalmology in Residence
Co-Director of Clinical Research, Hamilton Glaucoma Center
Director, Hamilton Glaucoma Center Data Coordinating Center

Graduate School
Harvard School of Pubic Health (M.S.)
Ben-Gurion University of the Negev (Ph.D.)

Postdoctoral Fellowship
University of Waterloo, Waterloo, Ontario, Canada

Special Interests
To improve our understanding of the complex relationship between structural and functional change over time in the aging and glaucoma eye; To develop computational and statistical techniques to improve glaucomatous change detection, reduce the number of visits and optimize the type of testing required; To identify risk factors that can predict glaucomatous progression and rapidly progressing glaucoma

Notables
Glaucoma Research Society (elected member); Achievement Award American Academy of Ophthalmology; Association for Research in Vision and Ophthalmology Silver Fellow; Glaucoma Societies; Achievement Award American Academy of Ophthalmology; Association for Research in Vision and Ophthalmology Silver Fellow



RETINA AND VITREOUS

Diseases of the retina cause severe and debilitating vision loss. Our retina physicians diagnose and treat macular degeneration, diabetic retinopathy, tumors, inherited retinal disease, retinal detachment, macular holes, and other important retinal diseases. The Joan and Irwin Jacobs Retina Center houses research projects seeking to find solutions for people of all ages who suffer from retinal conditions. The clinical research center at the Jacobs Retina Center enables patients to benefit from the latest advances in diagnostic equipment and therapies. Researchers working in the Center's laboratories apply the power of genetics and stem cell research towards the treatment of blinding diseases.

William R. Freeman, M.D.

Vice Chairman and Distinguished Professor of Ophthalmology
Director, Jacobs Retina Center
Co-Director, Retina Division

Medical School
Mount Sinai School of Medicine, New York

Residency
Lenox Hill Hospital, New York

Fellowship
University of California, San Francisco (Uveitis & Immunology)
University of Southern California, Los Angeles (Vitreo-Retinal Surgery)

Certification
Board Certification in Ophthalmology

Special Interests
Complicated retinal detachment; Diabetic retinopathy; Macular holes & age related macular degeneration

Notables
2013 US News and World Report's Top Doctors; Best Doctors in America; Research to Prevent Blindness, Physician Scientist Award; Foundation Fighting Blindness Award; City of San Diego Mayor Award; American Academy of Ophthalmology; Editor's Choice Lecture; America's Top Ophthalmologists; ARVO Silver Medal Fellow; Professor of Ophthalmology (Hon.), Wenzhou Medical College, People's Republic of China

Michael H. Goldbaum, M.D.

Professor of Ophthalmology In Residence
Co-Director, Retina Division

Medical School
Tulane University School of Medicine (M.D.)
Stanford University (M.S.)

Residency
Tulane University School of Postgraduate Medicine & U.S. Naval Hospital

Fellowship
Cornell University Medical Center and New York Hospital

Certification
Board Certification in Ophthalmology

Special Interests
Surgical & medical treatment of the retina and vitreous; Macular degeneration; Pediatric retina; Ocular tumors; Glaucoma informatics

Notables
2013 US News and World Report's Top Doctors; 2013 San Diego Magazine Top Doctor; Senior Achievement Award American Academy of Ophthalmology; Top Doctors, San Diego

Radha Ayyagari, Ph.D.

Associate Professor In Residence of Ophthalmology

Graduate School
Osmania University, Hyderabad, India

Postdoctoral Fellowship
Molecular Genetics at the National Eye Institute, NIH, Bethesda

Special Interests
Molecular genetics of macular and retinal dystrophy; Biological mechanisms underlying retinal diseases; Age-related macular degeneration; Diabetic retinopathy

Notables
Sybil B. Barrington Scholar Award; Lew R. Wasserman Merit Award

Dirk-Uwe Bartsch, Ph.D.

Associate Adjunct Professor of Ophthalmology
Co-Director, Jacobs Retina Center

Graduate School
University of California, San Diego

Postdoctoral Fellowship
University of California, San Diego

Special Interests
Retinal Imaging; Scanning Laser Imaging - confocal/non-confocal; Optical Coherence Tomography (OCT); Indocyanine Green and Fluorescein Angiography; Tomographic Reconstruction of the Posterior Poles

Notables
Association for Research in Vision and Ophthalmology Gold Fellow, 2013; Achievement Award American Academy of Ophthalmology

Lingyun Cheng, M.D., Ph.D.

Associate Adjunct Professor of Ophthalmology
Director, Ocular Pharmacology

Medical School
Shanxi Medical University, China

Residency
The First Teaching Hospital of Shanxi Medical University, China

Postdoctoral Fellowship
University of California, San Diego
Ideta Eye Hospital, Japan

Special Interests
Ocular drug delivery and vitreoretinal diseases

Henry A. Ferreyra, M.D.

Assistant Clinical Professor of Ophthalmology

Medical School
University of California, San Diego

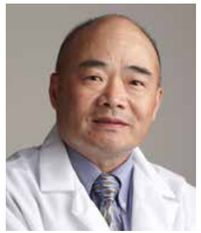
Residency
University of California, San Diego

Fellowship
University of California, San Diego

Certification
Board Certification in Ophthalmology

Special Interests
Electrophysiology; Inherited disorders of the retina; Age-related macular degeneration; Diabetic retinopathy; Retinopathy of prematurity

Notables
Outstanding Teaching Award



Peter Shaw, Ph.D.

Associate Project Scientist
of Ophthalmology

Graduate School
McMaster University, Ontario, Canada

Postdoctoral Fellowship
University of California, San Francisco

Special Interests
Mechanistic study of retinal ganglion cell differentiation and survival; Impact of genetics and innate immunity on eye; Gene therapy using engineered antibodies; Role of oxidative stress and its functional targets and therapies in macular degeneration; Diabetic retinopathy; Inherited retinal degenerations; Plasma biomarkers for eye diseases

Notables
Cheng Scholar; Van Slyke Award

Gabriel A. Silva, M.Sc., Ph.D.

Associate Professor of Bioengineering
Associate Adjunct Professor
of Ophthalmology
Jacobs Faculty Fellows Professor
of Bioengineering

Graduate School
University of Illinois at Chicago (Ph.D.)
University of Toronto (M.Sc.)

Postdoctoral Fellowship
Northwestern University

Special Interests
Cell signaling and information processing in biological cellular neural networks; Retinal physiology; Neural engineering; Degenerative retinal disorders

Notables
2013 - Society for Neuroscience (SFN) 2013 annual meeting 'Hot Topic' abstract; 2013 - 'Faculty of the Year' award for undergraduate education; 2012 - Tau Beta Pi Engineering Honors Society; Beverley and Clarence Chandran Distinguished Lecture, Duke University; Jacobs Faculty Fellows Endowed Chair in Bioengineering; American Society of Mechanical Engineers (ASME) Y.C. Fung Young Investigator Award; Wallace Coulter Foundation Early Career Award

Kang Zhang, M.D., Ph.D.

Professor of Ophthalmology
Chief, Ophthalmic Genetics

Medical School
Harvard Medical School/Massachusetts Institute of Technology (M.D./Ph.D. Program)

Residency
Wilmer Eye Institute at Johns Hopkins University

Postdoctoral Fellowship
University of Utah School of Medicine

Certification
Board Certification in Ophthalmology

Special Interests
Age related macular degeneration; Diabetic retinopathy; Inherited retinal degeneration

Notables
Burroughs Wellcome Fund Clinical Scientist Award in Translational Research; NIH Director's Transformative R01 Award; NIH K23 Mentored Clinician Scientist Award; Mentored Clinician Scientist Award; Lew R. Wasserman Merit Award; Charles Schepens Award for Excellence in Retina Research; Stark Research Award in Ophthalmology; Knights Templar Eye Foundation Research Award; First Bower Award

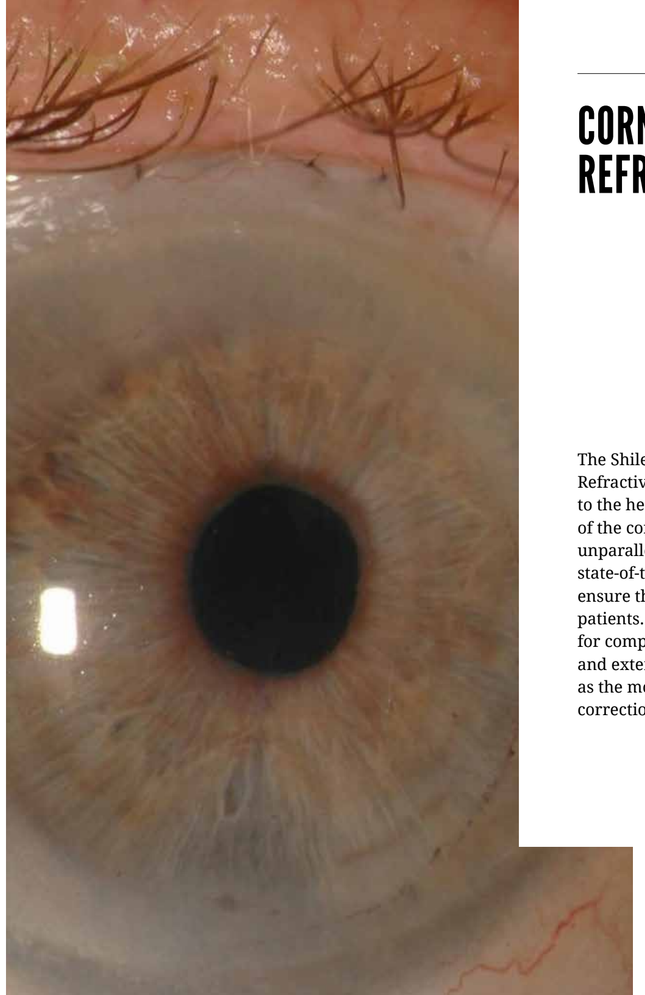
Jiagang "Jack" Zhao, Ph.D.

Assistant Project Scientist of Ophthalmology

Graduate School
Mount Sinai School of Medicine, New York

Postdoctoral Fellowship
Salk Institute, La Jolla, California

Special Interests
Stem cell based approaches for retinal disease modeling and treatment; Differentiation mechanisms of retinal cell fate restriction from pluripotent stem cells; Regeneration of retinal neurons from Muller glia



CORNEA AND REFRACTIVE

The Shiley Eye Center Cornea and Refractive speciality is dedicated to the health and functioning of the cornea and combines unparalleled care, expertise, and state-of-the-art equipment to ensure the best experience for patients. Shiley offers treatments for complex and high-risk corneal and external diseases, as well as the most current vision correction procedures.

Natalie Afshari, M.D.

Professor of Ophthalmology
Chief, Division of Cornea and
Refractive Surgery

Medical School
Stanford Medical School

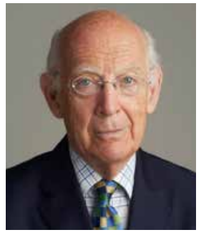
Residency
Massachusetts Eye and Ear Infirmary

Fellowship
Massachusetts Eye and Ear Infirmary

Certification
Board Certification in Ophthalmology

Special Interests
Fuchs Dystrophy; Cataract surgery; Corneal transplantation; Descemet's stripping endothelial keratoplasty (DSAEK); Intacs for keratoconus; Laser refractive surgery, including LASIK, LASEK/Advanced Surface Ablation, PRK, PTK, Surgical and medical diseases of cornea

Notables
Top 10 Women in Medicine Award 2012; Cornea Subspecialty Day AAO Co-Director 2012; Cornea Society, Board of Directors 2012-2013; Chief Judge for American Society of Cataract and Refractive Surgery Scientific Posters 2012 and 2013; CPE Cornea Fellows National Course Director 2012-2013; Leadership Development Program of American Academy of Ophthalmology 2012; 2013 US News & World Report Top Doctors (Top 1%); Best Doctors in America; American Academy of Ophthalmology Achievement Award; American Academy of Ophthalmology Secretariat Award; Councilor Emeritus American Academy of Ophthalmology; Co-editor Principles and Practice of Cornea; Research to Prevent Blindness Award; Heed Foundation Award



Stuart I. Brown, M.D.

Professor of Ophthalmology
Dr. Richard and Tatiana Lansche Chair of Ophthalmology

Medical School
University of Illinois Medical School

Residency
Tulane Medical School

Fellowship
Massachusetts Eye and Ear Infirmary

Certification
Board Certification in Ophthalmology

Special Interests
Methods of improving the efficiency of eye care delivery to pre-school age children throughout California; Corneal transplantation; Cataract surgery

Notables
Heed Ophthalmic Foundation Award; McLean Medal, Cornell/Columbia University; Outstanding Teacher Award

Weldon W. Haw, M.D.

Clinical Professor of Ophthalmology
Chief of Ophthalmology at Veterans Administration Medical Hospital

Medical School
University of California, Los Angeles School of Medicine

Residency
Stanford University School of Medicine (Chief Resident)

Fellowship
Stanford University School of Medicine

Certification
Board Certification in Ophthalmology

Special Interests
Cataract surgery; Cornea transplantation; Refractive surgery/LASIK

Notables
US News & World Report's Top Doctor; America's Top Doctors

Chris W. Heichel, M.D.

Associate Clinical Professor of Ophthalmology

Medical School
Chicago Medical School

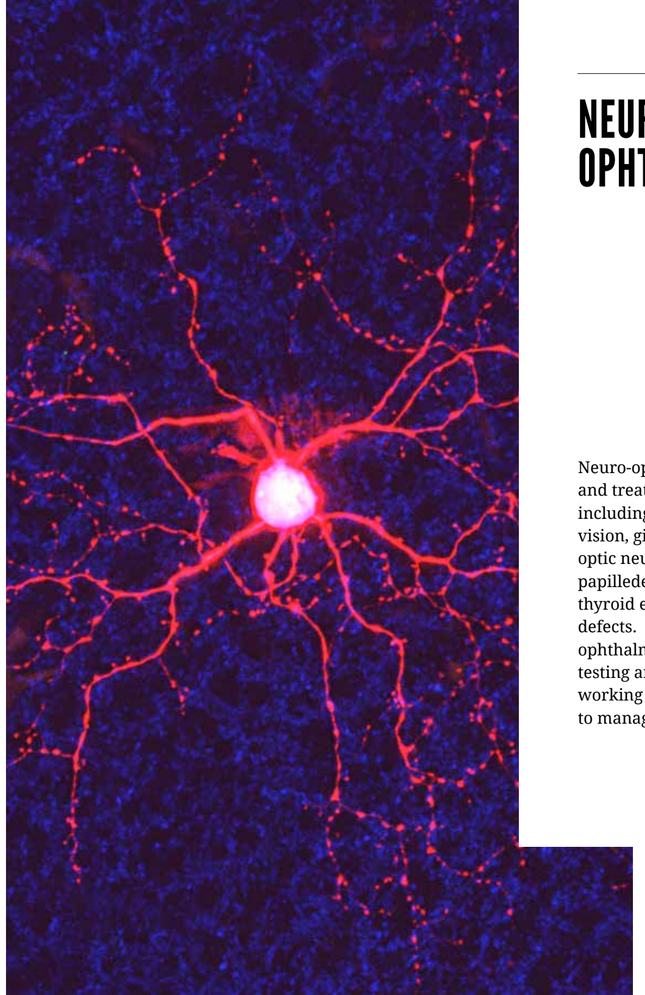
Residency
University of California, San Diego (Chief Resident)

Fellowship
University of California, San Diego

Certification
Board Certification in Ophthalmology

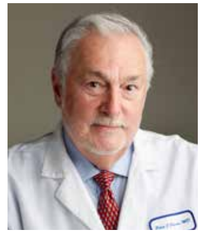
Special Interests
Corneal transplantations and keratoprosthesis (K-PRO); Descemet's stripping endothelial keratoplasty (DSAEK); Descemet's membrane endothelial keratoplasty (DMEK); Anterior segment and iris reconstruction; Challenging and traumatic cataract surgeries; IOL surgeries, including reposition, exchange and sutured IOLs; LASIK, PRK and Visian ICL; Advanced techniques in laser & refractive surgery; Treatment of Keratoconus, including INTACS and Collagen CrossLinking; Ocular surface tumors; Limbal stem cell transplantation; Corneal transplantations and keratoprostheses; challenging cataract and IOL surgeries; LASIK, Intacs, & Visian ICL; Advanced techniques in laser & refractive surgery; Keratoconus; Ocular surface tumors; Limbal stem cell transplantation

Notables
America's Top Ophthalmologists; US News & World Report's Top Doctor; San Diego Magazine Top Doctor; Outstanding Surgical Teaching; Outstanding Teacher Award; America's Top Ophthalmologists



NEURO-OPHTHALMOLOGY

Neuro-ophthalmologists diagnose and treat neuro-sensory disorders including brain tumors, double vision, giant cell arteritis, ischemic optic neuropathy, optic neuritis, papilledema, pseudotumor cerebri, thyroid eye disease and visual field defects. Shiley Eye Center's skilled ophthalmologists conduct diagnostic testing and thorough evaluation while working with the referring physician to manage the condition or illness.



Peter J. Savino, M.D.

Clinical Professor of Ophthalmology & Neurosciences

Medical School
University of Bologna School of Medicine

Residency
Georgetown University Medical Center

Fellowship
University of Miami

Certification
Board Certification in Ophthalmology

Special Interests
Myasthenia gravis; Optic neuritis, atrophy and neuropathy; Brain and nervous system tumors; Visual field defects; Degenerative, metabolic inflammatory & demyelinating diseases; Vascular disorders

Notables
2012, 2013 U.S. News and World Report Top Doctor (Top 1%); 2012, 2013 Outstanding Clinical Teaching Award, UC San Diego, Shiley Eye Center; Life Achievement Honor Award, American Academy of Ophthalmology; Honorary Fellowship, The Royal Australian and New Zealand College of Ophthalmologists; George L. Tabor, M.D. Award; Lifetime Member Awarded, Philadelphia Ophthalmology Club; New York State Sons of Italy Anton Banko Award; Golden Apple Award, Best Teacher of the Year Award; One of the "Best 100 Ophthalmologists in America," Ophthalmology Times; Beem Fisher Award, Chicago Ophthalmological Society

OPHTHALMIC PLASTIC AND RECONSTRUCTIVE SURGERY

Orbits. Eyelids. Face. Lacrimal system. These are the domains of oculofacial plastic surgery. Birth defects, cancer, trauma and the aging process can all alter the periorbital region. These surgeons rebuild, reconstruct, renew and make whole again. The UCSD Division of Ophthalmic Plastic and Reconstructive Surgery is an internationally recognized leader in patient care, teaching and research. Dr. Kikkawa and Dr. Korn have pioneered innovative operations and techniques that have become the standard.

Don O. Kikkawa, M.D., F.A.C.S.

Vice Chairman and Professor of Clinical Ophthalmology
Chief, Division of Ophthalmic Plastic and Reconstructive Surgery

Medical School
St. Louis University School of Medicine

Residency
University of California, Los Angeles

Fellowship
University of Wisconsin, Madison

Certification
Board Certification in Ophthalmology

Special Interests
Oculofacial surgery - aesthetic and reconstructive; Eyelid, lacrimal and orbital surgery; Thyroid eye disease - orbital decompression and eyelid surgery; Craniofacial disorders involving the eyelids and orbits; Orbital and eyelid tumors

Notables
2013 - U.S. News and World Report Top Doctor (Top 1%); 2012, 2013 – San Diego Magazine Physician of Exceptional Excellence; President-elect American Society of Ophthalmic Plastic and Reconstructive Surgery, Best Doctors in America; Top Doctor, US News and World Report; Top Doctors San Diego; Lester T. Jones Award; Marvin H. Quickert Award; ASOPRS Research Award; American Academy of Ophthalmology Senior Achievement Award; Outstanding Teaching Award

Bobby S. Korn, M.D., Ph.D., F.A.C.S.

Associate Professor of Clinical Ophthalmology

Medical School
University of Texas, Southwestern Medical School (M.D. & Ph.D.)

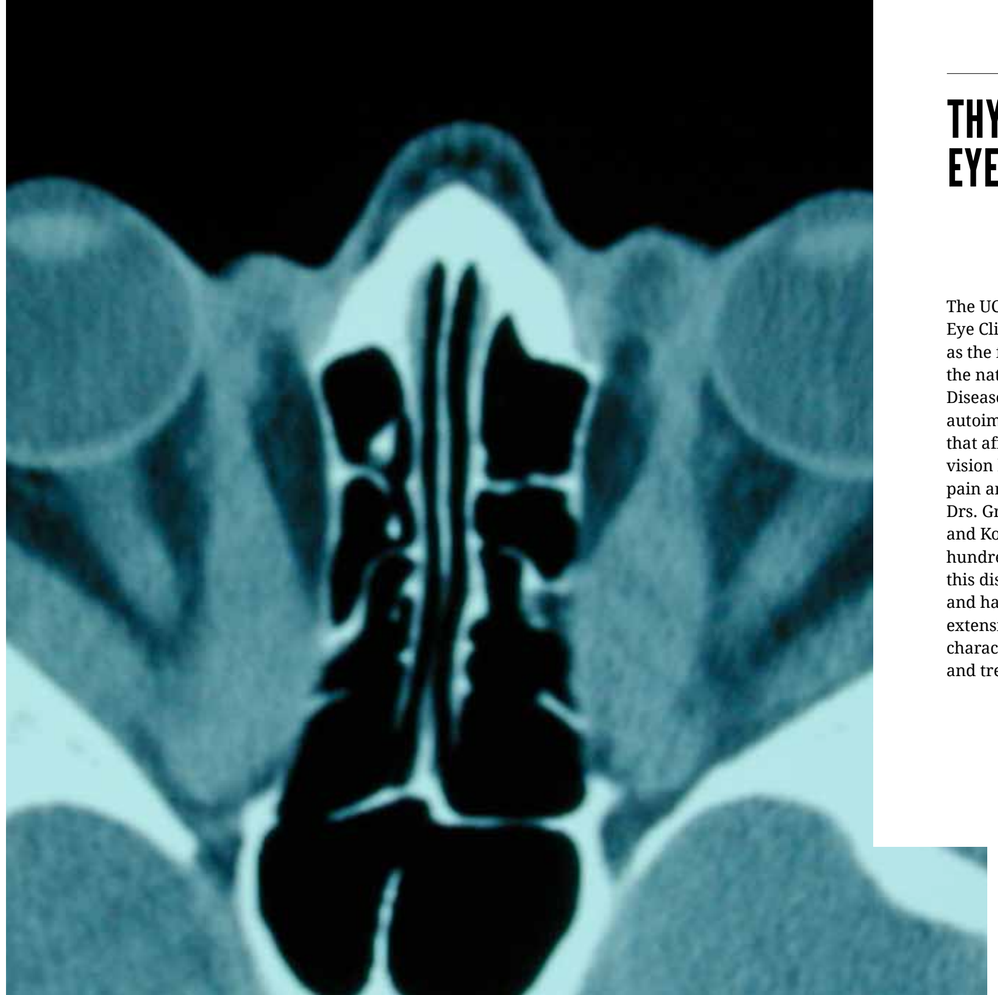
Residency
University of California, San Diego (Chief Resident)

Fellowship
University of California, San Diego

Certification
Board Certification in Ophthalmology

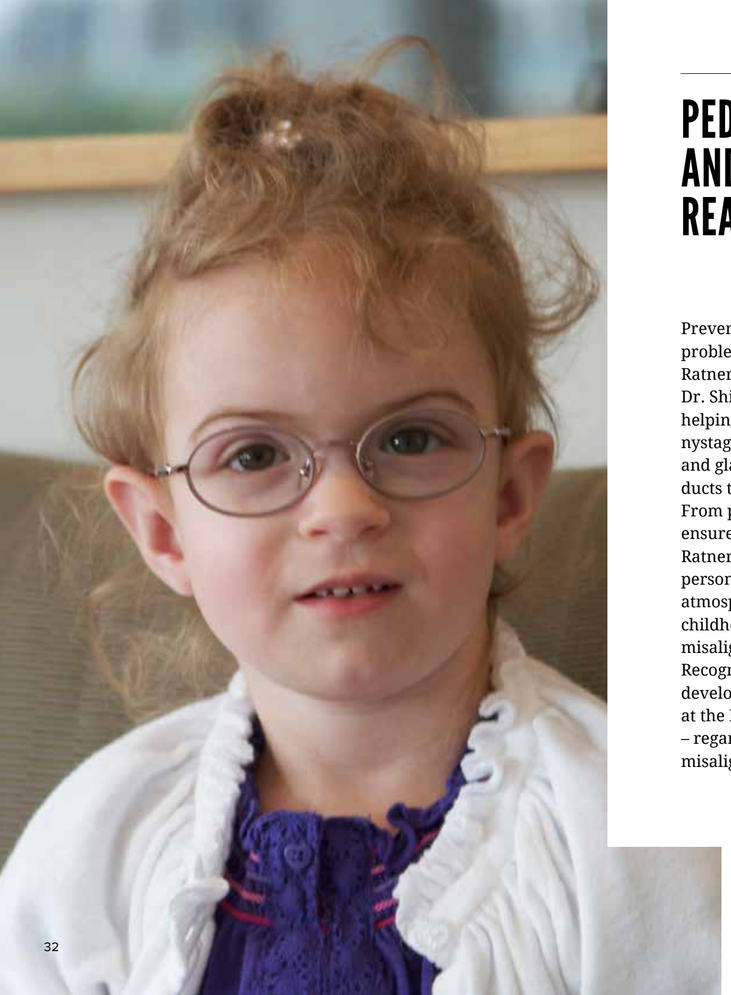
Special Interests
Aesthetic and reconstructive surgery (eyelid & face); blepharoplasty (eyelid lift surgery); Ptosis repair surgery; Asian/ethnic eyelid surgery (double eyelid surgery); Congenital birth defects; Thyroid eye disease – orbital decompression, eyelid retraction repair, ocular oncology, ocular surface disease, management of eyelid & orbital tumors & cancers; Endoscopic lacrimal (tear drainage) surgery; Cosmetic skin rejuvenation; Orbital stem cells

Notables
2012, 2013 - U.S. News and World Report Top Doctor;2008-2013 - Star Recognition Award for Highest Rated Instructional Course, awarded by the American Academy of Ophthalmology; 2012, 2013 – San Diego Magazine Physician of Exceptional Excellence; Editorial Board EyeNet Magazine, Editorial Board AAO BSCS Volume 7, American Academy of Ophthalmology Achievement Award; ASOPRS Research Award; Marvin H. Quickert Award; Outstanding teaching Award; Editor, Video Atlas of Oculofacial Plastic and Reconstructive Surgery Orbits. Eyelids.



THYROID EYE CLINIC

The UC San Diego Thyroid Eye Clinic began in 1997 as the first of its kind in the nation. Thyroid Eye Disease is a complex autoimmune disease that affects not only vision but also causes pain and deformity. Drs. Granet, Kikkawa and Korn have helped hundreds of patients with this disfiguring disorder and have published extensively on its characteristics and treatment.



PEDIATRIC OPHTHALMOLOGY AND ADULT EYE REALIGNMENT SERVICES

Preventing and treating vision loss and ocular problems in children is the highest priority at the Ratner Children's Eye Center. Dr. David Granet and Dr. Shira Robbins are world-renowned specialists in helping children with eye misalignments (strabismus), nystagmus, congenital diseases like pediatric cataracts and glaucoma, acquired problems from blocked tear ducts to "lazy eye" (amblyopia) as well as trauma. From premature babies to teenagers, our team ensures that each child seen at the family-oriented Ratner Children's Eye Center is given the attention and personal medical care they deserve in a child-friendly atmosphere. Adults with strabismus suffer from an old childhood problem, trauma, or a condition causing eye misalignment and require individualized intervention. Recognized worldwide for their teaching and developments in this field, the specialized surgeons at the Ratner Eye Center can help virtually everyone – regardless of age – suffering from various ocular misalignments and their consequences.

David B. Granet, M.D., F.A.C.S., F.A.A.P.

Professor of Ophthalmology & Pediatrics
Anne F. Ratner Chair of Pediatric Ophthalmology
Director, Anne F. and Abraham Ratner Children's Eye Center
Director, Division of Pediatric Ophthalmology

Medical School
Yale University School of Medicine

Residency
New York University Medical Center
(Chief Resident)

Fellowship
Children's Hospital of Philadelphia
Scheie Eye Institute

Certification
Board Certification in Ophthalmology

Special Interests
Pediatric ocular issues & strabismus; Adult eye misalignments; State-of-the-art adjustable suture strabismus surgery; Nystagmus; Childhood eye alignment disorders; Learning disorders & role of vision

Notables
2012, 2013 US News and World Report Top Doctors (Top 1%); 2012 Senior Honor Award, American Association for Pediatric Ophthalmology & Strabismus; 2013 Aurora Award for UCSD-TV show "Colon Cancer Screening"; 2013 San Diego Magazine Top Doctors; Senior Achievement Award AAO; American Association of Pediatric Ophthalmology Senior Honor Award; Chair-Elect AAP Section of Ophthalmology; Best Doctors in America; Top Doctors in San Diego; Visiting Professor National University Singapore; Co-Founder World Congress of Paediatric Ophthalmology & Strabismus; Co-Editor AAP Case Studies in Ophthalmology; Co-Director AAO Pediatric Ophthalmology Subspecialty Day 2011; Bronze Telly Award; Gold Aurora Award; Emmy Award

Shira L. Robbins, M.D., F.A.A.P.

Associate Clinical Professor
Educational Director of the Pediatric Ophthalmology/Strabismus Division

Medical School
Medical College of Pennsylvania Hospital

Residency
Hahnemann University Hospital

Fellowship
University of California, San Diego & Naval Medical Center

Certification
Board Certification in Ophthalmology

Special Interests
Strabismus/eye misalignment/double vision; Amblyopia; Retinopathy of prematurity; Pediatric glaucoma & cataracts, including intraocular lens placement; Nasolacrimal duct disorders; Congenital eye syndromes; Craniofacial syndromes; Systemic diseases affecting the eyes; Nystagmus

Notables
2012, 2013 US News and World Report Top Doctors; 2013 San Diego Magazine Top Doctors; Textbook Editor, AAP Challenging Cases in Pediatric Ophthalmology; Journal Section Editor, Current Ophthalmology Reports; National Institutes of Health LRP Award for Clinical Research; Best Doctors in America

COMPREHENSIVE OPHTHALMOLOGY

The UC San Diego Comprehensive Ophthalmology division provides a variety of services and ophthalmic evaluations that screen and treat a wide range of ophthalmic conditions, including cataracts, ocular surface disorders, glaucoma, diabetic retinopathy, conjunctivitis, blepharitis and macular degeneration. Primary eye care is provided for all types of conditions of the eye and surrounding structures, both routine and urgent. Treatments offered vary from medications and glasses prescriptions; to laser therapy, small in-office procedures and more invasive surgical options.

Jeffrey E. Lee, M.D.

Clinical Assistant Professor of Ophthalmology
Residency Program Director

Medical School
University of California, San Diego

Residency
University of California, San Diego

Certification
Board Certification in Ophthalmology

Special Interests
Orbital compartment syndrome in Burn patients; Facial burns; Orbital trauma; Ocular manifestations of HIV

Notables
2013 UC San Diego Ophthalmology Outstanding Teacher for Residents; and 2013 UC San Diego Outstanding Teaching Award for Medical Students

Thao P. Nguyen, M.D.

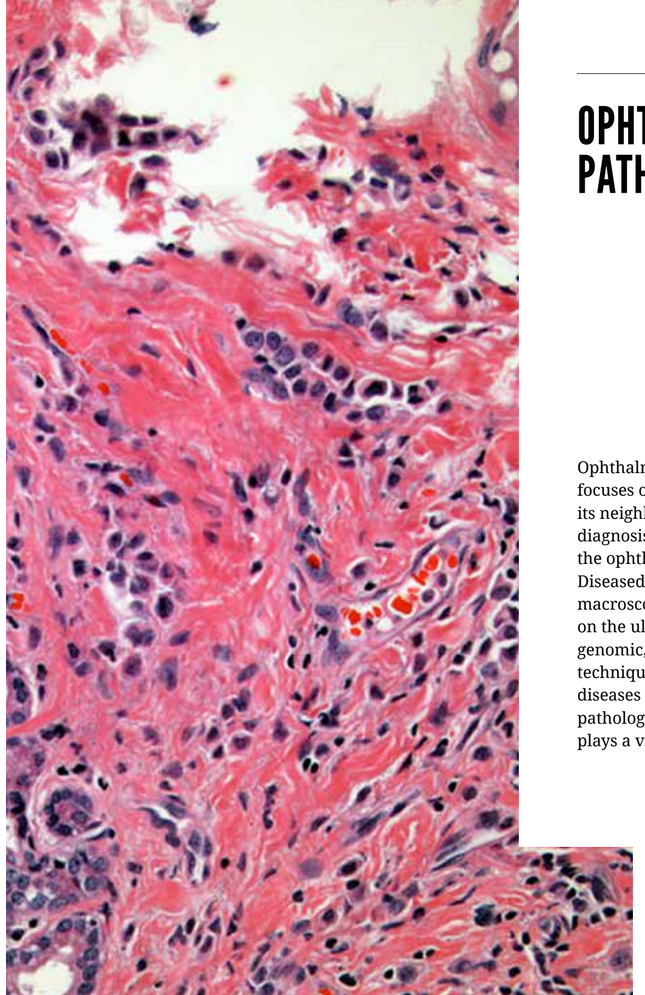
Assistant Clinical Professor of Ophthalmology

Medical School
University of Oklahoma, Tulsa

Residency
University of Rochester - New York

Fellowship
University of California, San Diego

Certification
Board Certification in Ophthalmology



OPHTHALMIC PATHOLOGY

Ophthalmic pathology service focuses on diseases of the eye and its neighboring tissues. Precision diagnosis of diseases is provided by the ophthalmic pathology service. Diseased tissues are examined macroscopically, microscopically and on the ultrastructural level. Advanced genomic, proteomic, and cytogenetic techniques can be utilized to diagnose diseases at a molecular level. The pathologic diagnosis of the disease plays a vital role in patient care.

Jonathan H. Lin, M.D., Ph.D., F.C.A.P.

Assistant Professor of Ophthalmology
Pathology, Cellular and Molecular Medicine

Medical School
Columbia University College of Physicians & Surgeons (M.D. & Ph.D.)

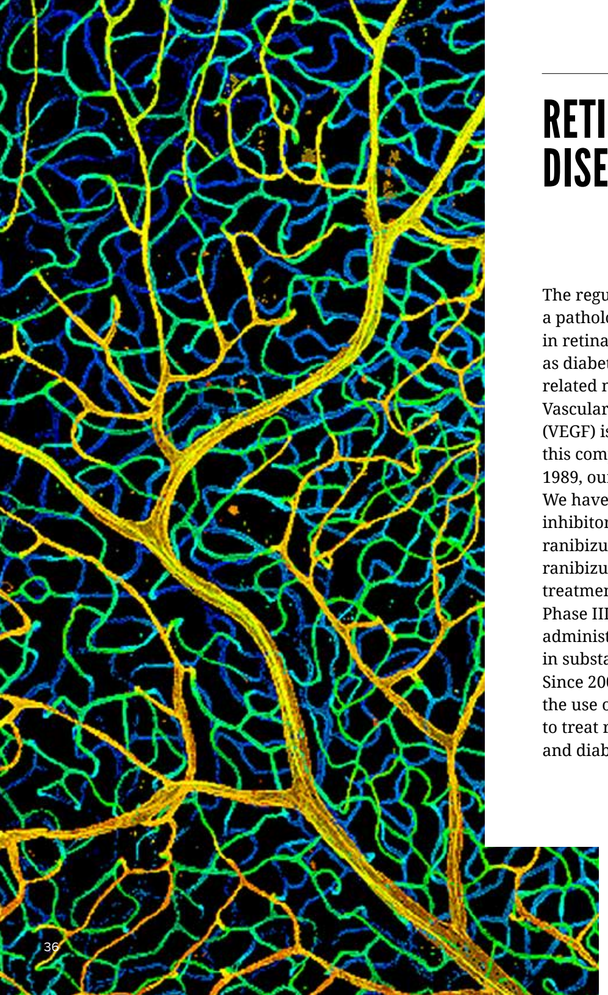
Residency
Brigham Women's Hospital (Anatomic Pathology)

Fellowship
University of California, San Francisco (Ophthalmic Pathology)

Certification
Board Certification in Anatomic Pathology

Special Interests
Ophthamic Pathology including pigmented ocular lesions (uveal melanoma, primary acquired melanosis), basal cell carcinoma, sebaceous gland lesions, inflammatory lesions (sclerosing orbital inflammatory pseudotumor, IgG4 disease), MALToma, corneas (PKPs, DSAEKs), conjunctival biopsies (conjunctival intraepithelial neoplasia - CIN), orbital lesions, intraocular fine needle aspirates/vitrectomy specimens; Cellular and molecular mechanisms of retinal degeneration; RPE and ocular stem cells.

Notables
American Society for Investigative Pathology Ramzi Cotran Early Investigator Award; American Society for Investigative Pathology Ramzi Cotran Early Investigator Award; Karl Kirchgessner Foundation Vision Research Award; American Federation for Aging Research New Investigator Award; Hellman Family Foundation Jon I. Isenberg Fellow; Hope for Vision Foundation New Investigator Award



RETINAL VASCULAR DISEASES

The regulation of angiogenesis is a pathological process that occurs in retinal vascular diseases such as diabetic retinopathy and age-related macular degeneration. Vascular endothelial growth factor (VEGF) is the principle mediator in this complex disease process and in 1989, our laboratory cloned this gene. We have subsequently developed two inhibitors of VEGF, bevacizumab and ranibizumab for clinical use. In 2006, ranibizumab was approved for the treatment of wet AMD after multiple Phase III trials demonstrating that administration of such agent results in substantial visual acuity gains. Since 2006, the FDA has expanded the use of ranibizumab, approving it to treat retinal vein occlusion in 2010 and diabetic macular edema in 2012.

Napoleone Ferrara, M.D.

Distinguished Professor of Ophthalmology and Pathology
Senior Deputy Director for Basic Sciences, UCSD Moores Cancer Center

Medical School
University of Catania Medical School, Catania, Italy

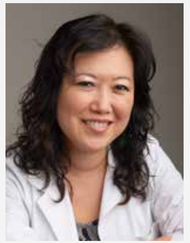
Residency
University of Catania Medical School, Catania, Italy

Fellowship
University of California, San Francisco

Special Interests
Regulation of angiogenesis (the formation of new blood vessels) and the role of VEGF (vascular endothelial growth factor); Continue to develop new therapies to treat age related macular degeneration building upon past development of Avastin® and Lucentis®.

Notables
2010 Lasker Debakey Clinical Medical Research Award; 2012 Juvenile Diabetes Research Foundation Award; 2012 The Economist Innovation Award (Bioscience); 2013 Elected Fellow and Member of Council of Advisors to the American Association of Cancer Research Academy; Damon Runyon-Rachleff Innovation Award Committee Member; North American Vascular Biological Organization Scientific Advisory Board Member; San Francisco State University Biology Program Advisory Board Member; 2012 Humanitas Clinical Institute Scientific Advisory Board Member; 2013 The Economist Innovation Award Jury Member; 2013 Breakthrough Prize in Life Sciences

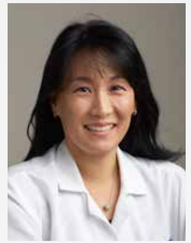
Anne B. Ho, O.D.



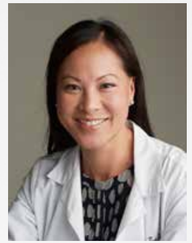
Pamela A. Hoo, O.D.

Lara Hustana, O.D.

John F. Kulischak, O.D.



Lianne Mizoguchi, O.D.



Jessica A. Tasto, O.D.

OPTOMETRY & LOW VISION

Shiley Eye Center optometrists are eye care professionals who perform comprehensive eye exams and are experts at fitting all types of contact lenses and glasses. Visual impairment from inherited diseases to diabetic retinopathy and macular degeneration can result in profound vision loss. Using the latest technological advancements in optical aids, optometrists provide much needed care for our low vision patients. Working hand in hand with Shiley ophthalmologists, the optometry service strives to deliver the best possible care to each patient.

Cornea
Nikki Heidi Camara, M.D.*
Bishoy Said, M.D.
Minh Vo, M.D.
Maria Vola, M.D.

Ophthalmic Plastic and Reconstructive Surgery
Preamjit Saonanon, M.D.*
Richard Scawn, M.D.
Katherine Whipple, M.D.

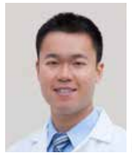
Pediatrics
Brenda Breidenstein, M.D.

** Not Photographed*

FELLOWSHIPS

Shiley Eye Center offers world-class fellowships in cornea, glaucoma, ophthalmic plastic and reconstructive surgery, pediatric ophthalmology, and retina. Fellows are exposed to intense training in both the clinical and research settings. Many go on to prominent academic positions around the world as well as practicing as outstanding clinicians in the global ophthalmic community.

CORNEA


OPHTHALMIC PLASTIC & RECONSTRUCTIVE SURGERY


PEDIATRICS

Glaucoma
Akram Belghith, Ph.D.
Daniel Freitas, M.D., Ph.D.
Na'ama Hammel, M.D.
Alex Huang, M.D., Ph.D.
Naira Khachatryan, M.D., Ph.D.
Tammy Kuang, M.D.*
Renato Lisboa, M.D.
Amir Marvasti
Atsuya Miki, M.D.
Myoung Sup Sim, Ph.D.
Andrew Tatham, M.D.
Jonathan Tung, M.D.
Siamak Yousefi, Ph.D.
Chunwei Zhang, M.D.

Retina
Payam Amini, M.D.
Cheryl Arcinue, M.D.
Giulio Barteselli, M.D.
Sharif El-Emam, M.D.
Isaac Ezon, M.D.
Huiyuan Hou, Ph.D.
Chuanhong Jie, M.D.*
Azadeh Khatibi, M.D.
Jun Kong, Ph.D.*
Su-Na Lee, M.D., Ph. D.
Yongchuan Liao, M.D.*
Hongrong Luo, Ph.D.*
Jing Luo, M.D., Ph.D.
Feiyan Ma, M.D.
Kaihui Nan, M.D.*
Hong Ouyang, Ph.D.
Bhubanananda Sahu, Ph.D.*
Yang Yang, M.D.*
Xiaohui Zhang, M.D.*
Ling Zhao, Ph.D.

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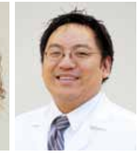
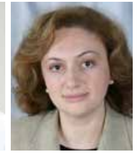
GLAUCOMA



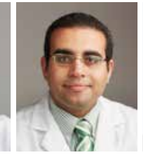




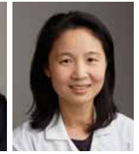


RETINA

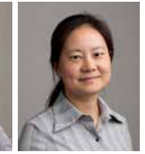


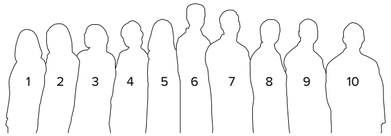













From left to right: [1] Lilit Minasyan, M.D., [2] Elizabeth Pinney, M.D., [3] Hema Ramkumar, M.D., [4] Cristiana Vasile, M.D., [5] Charlotte Gore, M.D., [6] Matthew Bedell, M.D., [7] Solomon Shaftel, M.D., Ph.D., [8] Jeffrey Liu, M.D. (Chief Resident 2012-2013), [9] Jean-Paul Abboud, M.D., Ph.D., [10] Kevin Tan, M.D.

RESIDENCY

The UC San Diego Ophthalmology Residency Training Program is a three-year program with a total of 12 resident physicians (four per year of training).

Our highly selective residency program receives over 400 applications per year from all over the country to fill four positions. It is known for its outstanding clinical and surgical training, as well as the value placed on scholarly activity and compassionate patient care. Our residents are among the brightest and most motivated, and continue to be high achievers during and after their training. As a result, graduating residents are regularly chosen for competitive post-residency Fellowship training in various subspecialties of Ophthalmology, such as Cornea, Glaucoma, Ophthalmic Plastic and Reconstructive Surgery and Retina.

During their training residents learn, under the supervision of the renowned Shiley faculty, to care for patients from all walks of life and with every type of eye problem, from common to very rare eye conditions. In addition, with Departmental support, residents partake in the many cutting-edge research opportunities available in the UC San Diego Department of Ophthalmology and present their work at pre-eminent national meetings such as the American Academy of Ophthalmology and the Association for Research in Vision and Ophthalmology.

The UC San Diego Ophthalmology Residency Training Program was recently recognized by the national accrediting body, the Accreditation Council for Graduate Medical Education, with a commendation on the excellence of the Residency Program and its faculty.

SHILEY

YEAR IN REVIEW

PATIENT VISITS
109,774

SURGERIES PERFORMED
3,885

FACULTY
35

STAFF
204

GRANTS
$10.7 MILLION

PUBLICATIONS
315

CLINICAL TRIALS
63

SHILEY EYE CENTER COMPLEX
91,000 SQ FT

OPHTHALMOLOGY EDUCATION

OPHTHALMOLOGY COMMUNITY LECTURE SERIES AND GRAND ROUNDS

The Department of Ophthalmology initiated a new Community Lecture Series held the first Monday of every month. The subjects cover all areas of ophthalmology and the Visiting Professor Lecturers include world renowned ophthalmologists. Continuing medical education (CME) credits are offered to attendees along with a reception immediately following the lectures.
The lectures are held at the UC San Diego Moores' Cancer Center in the Goldberg Auditorium.

The community also is invited to our Weekly Grand Rounds every Monday. The Grand Rounds consist of case presentations with moderated discussion. Interesting eye diseases, treatment dilemmas and surgical challenges are often the theme. These are offered in the Shiley Eye Center Conference Room.

2012-2013 Visiting Professors:

November 19, 2012
Natalie A. Afshari, M.D.
Professor and Chief, Division of Cornea and Refractive Surgery
Department of Ophthalmology
UC San Diego School of Medicine
Title: "Flaps, Bubbles and Lasers: Recent Advances in Cornea and Refractive Surgery"

December 17, 2012
Christopher A. Girkin, M.D.
Professor and Chairman, Department of Ophthalmology
University of Alabama, Birmingham School of Medicine
Title: "Implications of Laminar Morphometry on IOP-induced Optic Nerve Injury"

January 14, 2013
James C. Fleming, M.D.
Philip Lewis Professor of Ophthalmology
Chairman, Department of Ophthalmology
University of Tennessee, Memphis School of Medicine
Title: "Eyelid Lesions – Nasty or Nice?"

March 11, 2013
Peter J. McDonnell, M.D.
Director, Wilmer Eye Institute
William Holland Wilmer Professor of Ophthalmology
Department of Ophthalmology
The Johns Hopkins School of Medicine
Title: "Endophthalmitis: Why Isn't It More Common?"

April 8, 2013
Randall J. Olson, M.D.
Professor and Chairman
CEO, John A. Moran Eye Center
Department of Ophthalmology and Visual Sciences
University of Utah School of Medicine
Title: "What Bothers Patients after Successful Cataract Surgery"

May 13, 2013
Paul Sternberg, M.D., Ph.D.
G.W. Hale Professor and Chairman
Department of Ophthalmology
Vanderbilt University School of Medicine
Title: "Biomarkers, Genetic Testing and AMD"

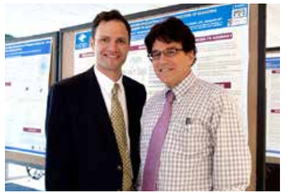
June 10, 2013
Lee M. Jampol, M.D.
Louis Feinberg Professor of Ophthalmology
Northwestern University Feinberg School of Medicine
Title: "SD OCT Opens a New World of White Spots"

(above) **Napoleone Ferrara, M.D. and speakers of the 2013 Ophthalmology Update**

OPHTHALMOLOGY UPDATE

The annual Ophthalmology Update was held February 16-17, 2013 at the Hilton Torrey Pines, La Jolla. The event was a resounding success with almost 300 participants from around the country. Don O. Kikkawa, M.D. and Robert N. Weinreb, M.D. served as Program Co-Chairs. The interdisciplinary faculty gave presentations on the latest surgical techniques, innovative ideas and research in ophthalmology. The keynote speaker, Napoleone Ferrara, M.D., joined the UC San Diego faculty this year. He updated the attendees on his transformative research on VEGF and its applications in age-related macular degeneration.

To kick off the Ophthalmology Update 2013, a special "Alumni Grand Rounds" was held at the UC San Diego Moores Cancer Center in the Goldberg Auditorium. Alumni presenters included Drs. Rigby Slight, Mark Fay, Ray Gariano and Tommy Korn. This was followed by the Stuart I. Brown Lecture delivered by Christopher Leung, M.D. Professor of Ophthalmology, Chinese University of Hong Kong ("The Continuum of Angle Closure Glaucoma").



(left) **Jeffrey Goldberg, M.D., Ph.D., and Robert N. Weinreb, M.D.**

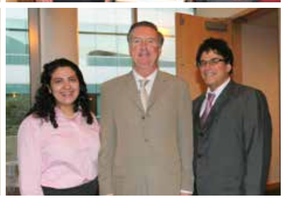
(left) **Isaac Ezon, M.D., Payam Amini, M.D., Cheryl Arcinue, M.D., William Freeman, M.D., and Natalia Camacho Espinosa, Ph.D.**

ARVO WRAP UP

After the May 5-9, 2013 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO) in Seattle, Washington, the Department of Ophthalmology held an ARVO Wrap-Up in the Shiley Eye Center Conference Room. The Department had its most visible presence yet with over 66 presentations and posters from our faculty, residents and fellows which was among the highest in the world. The Wrap-up provided an opportunity for medical students, residents, fellows and faculty to hear and view the outstanding research that has been conducted in the Department during 2012-2013 as well as engaging the scientists in discussion about their projects.

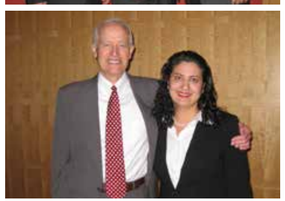
(left) **Natalie Afshari, M.D.**

(right) **Don Kikkawa, M.D., Christopher Girkin, M.D., and Robert N. Weinreb, M.D.**



(left) **Don Kikkawa, M.D., James Fleming, M.D., and Robert N. Weinreb, M.D.**

(right) **Natalie Afshari, M.D., Peter McDonnell, M.D., and Robert N. Weinreb, M.D.**



(left) **Randall Olson, M.D., and Natalie Afshari, M.D.**

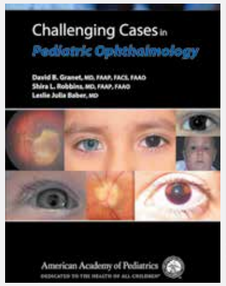
(right) **Shira Robbins, M.D., William Freeman, M.D., Paul Sternberg, M.D., Ph.D., Natalie Afshari, M.D., and Don Kikkawa, M.D.**

(left) **Don Kikkawa, M.D., Natalie Afshari, M.D., Michael Goldbaum, M.D., Lee Jampol, M.D., Robert N. Weinreb, M.D., William Freeman, M.D., and David Granet, M.D.**

PUBLICATIONS

Several Members of the Department of Ophthalmology have recently published textbooks that serve as standard references for ophthalmologists worldwide. Some have been translated into multiple languages establishing Shiley's global reach.

A



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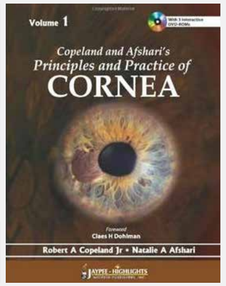

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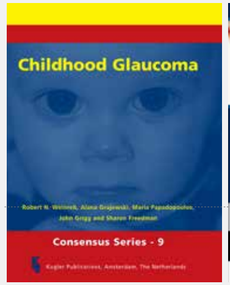

D

A: David B. Granet, M.D. and Shira L. Robbins, M.D. edited, "Challenging Cases in Pediatric Ophthalmology".
B: Natalie A. Afshari, M.D. edited, "Principles and Practice of Cornea, 2 Volume Set".
C: Robert N. Weinreb, M.D. edited, "Childhood Glaucoma".
D: Bobby S. Korn, M.D., Ph.D. and Don O. Kikkawa, M.D., edited, "Video Atlas of Oculofacial Plastic and Reconstructive Surgery".

CORNEA

Afshari NA, Minear MA, Rimmler J, Balajonda E, Watson S, Hauser MA, Allingham R, Klintworth GK, Li YJ, Gregory SG. Genetic screen of African-Americans with Fuchs endothelial corneal dystrophy. Association for Research in Vision and Ophthalmology (ARVO). 2012.

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Char Decroos F, Delmonte DW, Chow JH, Stinnett SS, Kim T, Carlson AN, Afshari NA. Increased Rates of Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK) Graft Failure and Dislocation in Glaucomatous Eyes with Aqueous Shunts. J Ophthalmic Vis Res 2012;7:203-13.

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Copeland RA, Afshari NA (Editors) Two Volumes, The Principles and Practice of Cornea by Jaypee Brothers, September 2012.

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Haw W. Redefining the Dry Eye Treatment Strategy. Ophthalmology Update. Supplement to Advanced Ocular Care. July/August 2012; 10-13.

Hwang RY, Goldhagen B, Kuo AN, Afshari NA. Changes in corneal biomechanics after descemet stripping endothelial keratoplasty in Fuchs dystrophy. Association for Research in Vision and Ophthalmology (ARVO). 2012.

Kaufman HK, Haw W. Ganciclovir Ophthalmic Gel 0.15%: Safety and Efficacy of Ganciclovir Ophthalmic Gel of a New Treatment for Herpes Simplex Keratitis. Current Eye Research. May 2012; 37(7): 654-60.

Meekins LC, Afshari NA. Ever-evolving technological advances in cataract surgery: can perfection be achieved? Curr Opin Ophthalmol 2012; 23:1-2.

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Millender TW, Reller LB, Meekins LC, Afshari NA. Streptococcal pharyngitis leading to corneal ulceration. Ocul Immunol Inflamm 2012; 20:143-4.

Rosado-Adames N, Goldhagen B, Meekins LC, Proia A, Epestin DL, Rao V, Afshari NA. Expression profile of RhoA and Rho kinase in the human corneal epithelium and endothelium. Association for Research in Vision and Ophthalmology (ARVO). 2012.

Rosado-Adames N, Afshari NA. The changing fate of the corneal endothelium in cataract surgery. Curr Opin Ophthalmol 2012; 23:3-6.

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RETINAL VASCULAR DISEASES

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LECTURES

NATALIE A. AFSHARI, M.D.

"New Horizons in Fuchs Corneal Dystrophy: Surgical Interventions and Genetics", University of California Davis, Davis, CA, February 2012.

"Advances in Corneal Surgery: Implications in Endothelial Keratoplasty", Louis Young, M.D. Visiting Professor, Annual Symposium for Residency Graduation, Howard University, Washington, DC, June 2012.

"Refractive Surgery in 2020: How Would We Treat Refractive Errors Then?" and "Lipiflow Thermal Pulsation Therapy", Ophthalmology Update 2013, University of California, San Diego Shiley Eye Center, La Jolla, CA, February 2013.

"New Horizons in Corneal Endothelium and Fuchs Dystrophy – Surgical Interventions, Cell Therapy & Genetics", "A Journey through Cornea from A to Z", University of California, San Francisco, CA, March 2013.

"Anti-Angiogenesis Therapy: Corneal Graft Rejection Implications", Invited Symposium Speaker, American Society of Cataract and Refractive Surgery, San Francisco, CA, April 2013.

"Opportunities and Challenges of the Academic Ophthalmologist", The Association for Research in Vision and Ophthalmology (ARVO), Clinician-Scientist Forum: How to Become a Successful Clinician-Scientist, Seattle, WA, May 2013.

"My Technique for Performing Combined EK and CE" and "The Genetics of FECD: What Have we Learned and What Questions Remain?", Advances in Cornea Surgery Symposium Invited Speaker, Tissue Banks International, Santa Monica, CA, May 2013.

"Advances for Corneal Surgery: Implications for Endothelial Diseases", "A Journey Through Cornea From A to Z", Larry Piebenga, M.D. Annual Lectureship, Annual Symposium for Residency Graduation University of Missouri, Kansas City, MO, June 2013.

"Practical IOL Calculations", Ninth Annual Harvard Medical School Intensive Cataract Surgery Training Course, Harvard University Massachusetts Eye and Ear Infirmary, Boston, MA, June 2013.

"Diffuse Lamellar Keratitis" and "Postoperative Dry Eye/Corneal Neuralgia", Lasik Certification Course, Navy Refractive Surgery Center, San Diego, CA, June 2013.

DIRK-UWE BARTSCH, Ph.D.

"Introduction to Scanning Laser Ophthalmoscopy Imaging" and "What You Need to Know About Spectral Domain OCT" and "Introduction to Scanning Laser Ophthalmoscopy Imaging Workshop", 43rd Annual Educational Program of the Ophthalmic Photographers Society, Chicago, IL, November 9-13, 2013.

NAPOLEONE FERRARA, M.D.

"Endothelial Phenotypes", Keynote Talk, Gordon Research Conference, Il Ciocco, Lucca, Italy, July 30-August 3, 2012.

5th Mayo Clinic Angiogenesis Symposium, Minneapolis, MN, August 17-19, 2012.

7th Chinese Conference on Oncology, Beijing, China, September 6-9, 2012.

"Molecular and Cellular Mechanisms in Angiogenesis", FEBS Workshop:, Capri, Italy, October 14-17, 2012.

Research Lecture at the Nobel Forum, Stockholm, Sweden, October 18, 2012.

Uppsala University Seminar, Uppsala, Sweden, October 19, 2012.

91st Annual Beaumont Lecture, Michigan State Medical Society, Troy, MI, October 26, 2012.

15th International Symposium on Anti-Angiogenic Agents, La Jolla, CA, January 31 - February 2, 2013.

"Ophthalmology Update 2013", Keynote Talk, La Jolla, CA, February 16-17, 2013.

Vision Discovery Institute Annual Retreat, Keynote Talk, Georgia Health Sciences University, Augusta, GA, March 14-15, 2013.

2013 Tumor Microenvironment Symposium, Mayo Clinic, Rochester, MN, April 15, 2013.

Turkish National Cancer Congress, Antalya, Turkey, April 19-20, 2013.

European Brain Research Institute Symposium in Memory of Rita Levi-Montalcini, Rome, Italy, April 21-22, 2013.

Trans-NIH workshop on angiogenesis, Keynote Talk, Bethesda, MD, May 20-21, 2013.

21st Gifford Lecture, University of Nebraska Medical Center, Omaha, NE, May 23, 2013.

Korea Cancer Association Satellite Symposium, Keynote Talk, Seoul, Korea, June 14, 2013.

HENRY FERREYRA, M.D.

"Treatment of Diabetic Macular Edema," Fall California Council of the Blind, San Diego, CA, November 2012.

WILLIAM R. FREEMAN, M.D.

"Update on HIV Retinal Disease", American Uveitis Society, Park City, UT, January 2012.

"New Approaches to Medical and Surgical Therapies" and "Changing Treatments for Choroidal Neovascularization", Invited Lecturer, Ophthalmology Update, San Diego, CA, February 2012.

"Systemic Versus Local Therapy of Uveitis", Case Discussions, Invited Lecturer, Retinal Disease Summit, Newport Beach, CA, March 2012.

Lectures on ocular drug delivery and new treatments and approaches to retinal imaging, Visiting Professor, University of Pennsylvania, Philadelphia, PA, May 2012.

"Navigated Laser Therapy in Combination with Anti-VEGF in Diabetic Macular Edema", American Society of Retina Specialists, Las Vegas, NV, August 2012.

"History of Ocular Infections" and "CMV Retinitis", Invited Lecturer, American Academy of Ophthalmology, Chicago, IL, November 2012.

"Update on Retinal Diseases and Treatments", Visiting Professor, Hadassah University Medical Center, Jerusalem, Israel, November 2012.

"Update on Retinal Diseases and Treatments" Visiting Professor, King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia, November 2012.

"Advances in Retinal Research: Nanotechnology & Future of Retinal Diseases", "Management of Diabetic Macular Edema (DME): Basics to 2013", "Pathomechanisms and Molecular Basis of DME", "Modern Day Perspectives on the Use of Dyes in VR Surgery", "Use of Image Registered Raster Scanning SD OCT to Facilitate 25 Gage ERM Removal", "Imaging Retinal Vasculature and Disease: SD-OCT", "Updates on Diagnosis and Treatment of Macular Diseases: Vitreo Macular Traction Syndrome", Invited Lecturer, 28th Asia-Pacific Academy of Ophthalmology Congress - All India Ophthalmological Society (APAO-AIOS), Hyderabad, India, January 2013.

"Retina: Update on Diabetic Retinopathy", Invited Lecturer, Ophthalmology Update 2013, University of California, San Diego, La Jolla, CA, February 2013.

JEFFREY L. GOLDBERG, M.D., Ph.D.

"Neuroprotection of the Retina and the Optic Nerve Head: Bench to Bedside", Euretina Society Winter Meeting, Symposium Speaker, Rome, Italy, January 2012.

"Nanotechnology in Biomedicine: Imaging", Nature Miami Winter Symposium, Session Chairman, Miami, FL, February 2012.

"RGC Axon Survival and Regeneration", Symposium Speaker, American Glaucoma Society, Washington, DC, March 2012.

Invited Speaker, University of California, San Diego, Hamilton Glaucoma Center, La Jolla, CA, April 2012.

Invited Speaker, Vanderbilt Eye Institute, Nashville, TN, April 2012.

"Nanoparticles and Neurotrophins: Engineering Regeneration", Invited Speaker, Fox Center/ McGowan Institute, Regenerative Medicine in Ophthalmology Conference, Pittsburgh, PA, May 2012.

Invited Lecturer, Attendant to thesis defense, Fudan University Medical School/EENT Hospital, Shanghai, May 2012.

"Retinal Ganglion Cell Development and Regeneration", Cogan Award Lecture, ARVO, Seattle, WA, May 2012.

"RGC Survival and Regeneration: Electrical Activity and Adenylate Cyclases" and "Regenerative Medicine in Glaucoma", Invited Speaker, Vanderbilt Eye Institute, Nashville, TN, September 2012.

"Axon Guidance Synapse Formation & Regeneration", Session Chair, Cold Spring Harbor Labs, Cold Spring Harbor, NY, September 2012.

Invited Faculty, Heed Ophthalmic Foundation Residents Retreat, Cleveland, OH, October 2012.

"Transplantation and Regeneration", NanoSymposium Chair, Society for Neuroscience Annual Meeting, San Diego, CA, October 2012.

"Survival and Regeneration in the Visual System", Invited Lecturer, Burke Medical Research Institute, Cornell/Weill School of Medicine, New York, NY, October 2012.

"Survival and Regeneration in the Visual System", Invited Speaker, Wilmer Eye Institute, Johns Hopkins, Baltimore, MD, November 2012.

"Direct Delivery of Neuroprotective Glaucoma Therapy", American Academy of Ophthalmology, Chicago, IL, November 2012.

World Stem Cell Summit, Invited Speaker, Palm Beach, FL, December 2012.

"Why Glaucoma Biomarkers?" New Horizons Forum, Invited Faculty, San Francisco, CA, January 2013.

"NT-501 CNTF Implant for Glaucoma and NAION: Phase 1 Data", Glaucoma 2.0, Bench to Bedside (CME), Invited Faculty, Miami, FL, January 2013.

Glaucoma 2.0, Bench to Bedside, Miami, FL, Course Co-Director, January 2013.

"KLFs in Axon Regeneration", University of Maryland Chemistry-Biology Interface Program, Invited Faculty, College Park, MD, February 2013.

Invited Participant, NEI Audacious Goals, Bethesda, MD, February 2013.

"Glaucoma: Neuroprotection", Ophthalmology Update (CME), Invited Faculty, San Diego, CA, February 2013.

"Neural Regeneration and Cell Therapies", Invited Faculty, American Glaucoma Society Annual Meeting, San Francisco, CA, March 2013.

"RGC Survival and Regeneration", Invited Speaker, Medical College of Wisconsin, Milwaukee, WI, April 2013.

"Biomarkers in Glaucoma" and "Unmet Needs in Glaucoma", Invited Faculty, "Beyond IOP" CME Meeting, San Francisco, CA, April 2013.

"Stem Cells for Glaucoma", Society for Brain Mapping and Therapeutics, Baltimore, MD, May 2013.

"Optic Nerve Regeneration and Neuroprotection" and "Vision Restoration: Regenerative Medicine in Ophthalmology", Invited Faculty, Fox Center/UPMC Meeting, Pittsburgh, PA, June 2013.

"Anti-Glaucoma Medications Beyond IOP" and "Retinal Ganglion Cells in Glaucoma: Bench to Bedside", Invited Faculty, World Glaucoma Congress, Vancouver, Canada, July 2013.

DAVID B. GRANET, M.D.

"Strabismus", Invited Speaker, Basic Science Lecture Series for Residents, University of California, San Diego, Department of Ophthalmology, La Jolla, CA, June 2012.

"Strabismus and Pediatric Ophthalmology", Invited Speaker, Introduction to Clinical Medicine MS2 Lecture Series, University of California, San Diego, School of Medicine, June 2012.

"Retinoscopy and Refractions", Invited Speaker, University of California, San Diego, Department of Ophthalmology, La Jolla, CA, July 2012.

"Thyroid Associated Orbitopathy", "Improving Strabismus Surgical Outcomes in Thyroid Eye Disease" and "Brown Syndrome: What We Know Now", Invited International Chair: 2nd World Congress of Paediatric Ophthalmology & Strabismus (WCPOS), Milan, Italy, September 2012.

"Battle of the Bulge", Invited Speaker, The Association for Research in Strabismus (Squint Club), St. Louis, MO, September 2012.

"Strabismus in Thyroid Orbitopathy", Invited Speaker, The Association for Research in Strabismus (Squint Club), St. Louis, MO, September 2012.

"Double Vision/Strabismus Surgery", Invited Speaker, Graves Disease & Thyroid Foundation Annual Meeting, San Diego, CA, October 2012.

"Reading and Learning", Invited Speaker, California Association of Orientation & Mobility Specialists Annual Meeting, San Diego, CA, November 2012.

"Strabismus", Invited Speaker, University of California, San Diego, Department of Ophthalmology, Pediatric Grand Rounds, La Jolla, CA, February 2013.

"How to Be a Superhero", Invited Speaker, Lunch N Learn, University of California, San Diego, Department of Ophthalmology, La Jolla, CA, February 2013.

"Update on Thyroid Eye Disease", Invited Speaker and Moderator, University of California, San Diego, Ophthalmology Update 2013 Annual Meeting, La Jolla, CA, February 2013.

"Thyroid Orbitopathy", Invited Speaker, University of California, Davis Health System Eye Center, Pediatric Grand Rounds, Sacramento, CA, March 2013.

"Vision, Learning and Reading: Do the Eyes Have It?", Invited Speaker, University of California, Davis Health System Eye Center, Pediatric Grand Rounds, Sacramento, CA, March 2013.

"A Complex Case of Myopic Fixus", Invited Speaker, Annual Meeting of the American Association for Pediatric Ophthalmology & Strabismus (AAPOS), Boston, MA, April 2013.

"Surgical Pearls", Invited Speaker, Annual Meeting of the American Association for Pediatric Ophthalmology & Strabismus (AAPOS), Boston, MA, April 2013.

"Brown Syndrome Treatment: A Video Review" and "Paradoxic Pupils-A Video Demonstration", Invited Speaker, Annual Meeting of the American Association for Pediatric Ophthalmology & Strabismus (AAPOS), Boston, MA, April 2013.

"Nystagmus", Invited Speaker, Resident Didactic Lecture Series, University of California, San Diego, Department of Ophthalmology, La Jolla, CA, May 2013.

"Reading and Learning", Invited Speaker, Teachers of the Visually Impaired and Deaf & Hard of Hearing Program, South Bay Union School District, Chula Vista, CA, May 2013.

"How to be a Superhero", Invited Speaker, University of California, San Diego, Department of Ophthalmology, Surgery Center staff, La Jolla, CA, June 2013.

"Restrictive Strabismus: Thyroid", Invited International Speaker, The 15th National Congress of Pediatric Ophthalmology & Strabismus, Chinese Ophthalmological Society, Tianjin, People's Republic of China, June 2013.

CHRIS W. HEICHEL, M.D.

"Update on DSAEK" and "Post-Refractive Surgery IOL Power Calculations", Ophthalmology Update 2013, La Jolla, CA, February 2013.

ANDREW D. HUBERMAN, Ph.D.

"Wiring Visual Circuits to Perform Specific Functions", Gordon Research Conference on Neural Development, Newport, RI, August 12-17, 2012.

"Assembling Circuits for Delivering Specific Qualities of Visual Information to the Brain", INCF Workshop on Neuroinformatics, Munich, Germany, September 12, 2012.

"Genetic Approaches to Probing Visual Circuit Development, Disease, and Function", Neurobiology Seminar Series, University of Louisville, KY, December 13, 2012.

Johns Hopkins, Department of Neuroscience Seminar Series, Baltimore, MD, Feb 28, 2013.

"Customized Direction Selective Visual Circuits that Perform Specific Functions", Janelia Farm/ HHMI, Meeting on: Insect Vision, Ashburn, VA, March 3-6, 2013.

"Assembly, Function and Customization of Visual Circuits", McGill University, Center for Research in Neuroscience Seminar Series, Montreal, Canada, March 13, 2013.

Memorial Sloan-Kettering Cancer Center, Neurobiology Seminar Series, New York, NY, April 11, 2013.

NYC Vision Seminar Series (Columbia, NYU, Cornell, SUNY Optometry), May 20,2013.

"Customizing Neural Circuits to Perform Specific Visual Functions", Cell Press Symposium: Genes, Circuits and Behavior, Toronto, Canada, June 3-5, 2013.

DON O. KIKKAWA, M.D.

"Masters Symposium Asian Eyelid Rejuvenation", Moderator, "The Science of Periorbital Aging", Invited Speaker, Vegas Cosmetic Surgery 2012. An International Multispecialty Syposium. Las Vegas, NV June 7-8, 2012.

"Pediatric Orbital Disorders", Moderator, "How the Orbital Surgeon Can Help or Hurt Ocular Alignment", Invited Speaker, Thyroid Eye Disease Session, 2nd World Congress of Pediatric Ophthalmology, Milan, Italy, September 7-9, 2012.

"Congenital Ptosis", "Chronic Dacryocystitis", "Enucleation Implants", "Basal Carcinoma and Malignant Melanoma", "Surgery vs. Observation. Surgical Timing of Orbital Fractures", "Blepharoplasty", "Brow Lifts: Internal, External, Coronal, Pre-trichial, Endo", "Orbicularis Extirpation", "My Favorite Secret Pearls", Invited Speaker 2012 Oculofacial Plastic Surgery Conference, University of Illinois Eye and Ear Infirmary, Chicago, IL Sept 14, 2012.

"Bridging the Gap in International Oculoplastic Surgery: What Can We Learn from Each Other?", Invited Speaker, Tongren Eye Center 10th Anniversary Symposium, Beijing, China, September 22-23, 2012.

"The Art and Science of Orbital Surgery", Invited Speaker, "Cases from the UCSD Oculoplastics Archives" UCSF Department of Ophthalmology, San Francisco, CA October 11, 2012.

"Eyelid Reconstruction", Invited Speaker, "Cases from the UCSD Oculoplastics Archives", Resident Lecture, Singapore National Eye Center, Singapore, November 28, 2012.

"The Art and Science of Orbital Surgery", Invited Speaker Grand Rounds, Singapore National Eye Center, Singapore, November 28, 2012.

"Lower Blepharoplasty", Invited Speaker, "Failed DCR – What's Next?", "Pearls in Implanting Jones Tubes", "Botox and Filler Injections – Pearls and Pitfalls", "Update on Endoscopic Browlift", "Strategies in Dealing with the Contracted Socket", "Insights into Orbital Decompression", Oculoplastic Instructional Course, Singapore National Eye Center, Singapore, November 30-December 1, 2012.

"Multidisciplinary Treatment of Thyroid Orbitopathy", "The Art and Science of Orbital Surgery", "Ten Minute Ptosis Repair", "Endoscopes in Oculoplastic Surgery", "Management of Anophthalmic Socket Contraction", Invited Speaker, Saudi Ophthalmology 2013 (SO-2013), combined meeting of the 30th Annual Symposium of the King Khaled Eye Specialist Hospital and the 25th Annual Scientific Meeting of the Saudi Ophthalmologic Society, Riyadh, Saudi Arabia, March 3-6, 2013.

"Complications of Blepharoplasty", "Pearls of Blepharoplasty", "Transconjunctival Fat Redraping", "Treatment of Lower Lid Retraction," "Injectables: A Replacement for Surgery?", Invited Speaker, 36th International Symposium of Ophthalmology Moacyr Álvaro - SIMASP 2013, Sao Paolo, Brazil, March 7-10, 2013.

Invited Speaker, III Congreso International de la Asociacion Colombiana de Cirugia Plastica Ocular. Cali, Colombia, May 23-24, 2013

"Use of Neurotoxins in Thyroid Eye Disease", Invited Speaker, International Thyroid Eye

Disease Society, Vancouver, British Columbia, Canada, June 28-29, 2013.

BOBBY KORN, M.D., Ph.D.

"Orbital Reconstruction in Craniofacial Syndromes", Invited Speaker, World Congress of Pediatric Ophthalmology and Strabismus, Milan, Italy, September 12, 2012.

"Fundamentals of Ophthalmic Plastic and Reconstructive Surgery Course", Visiting Professor, Sheikh Khalifa Medical Center, Abu Dhabi, UAE, October 28-31, 2012.

"Controversies – Endonasal DCR", Invited Speaker, Oculofacial Subspecialty Conference, American Academy of Ophthalmolgy, Chicago, IL, November 10, 2012.

"Best of Grand Rounds – A Postop Day #0 Surprise", Invited Speaker, Asia Pacific Academy of Ophthalmology 2013, Hyderabad, India, January 17, 2013.

"Controversies – Best Implant for Orbital Fracture Repair", Invited Speaker, Asia Pacific Academy of Ophthalmology 2013, Hyderabad, India, January 18, 2013.

"Fillers and Neurotoxins: New Approaches to Medical and Surgical Therapies", Invited Speaker, Ophthalmology Update 2013, San Diego, CA, February 16, 2013.

"Endoscopic Lacrimal Surgery", Invited Speaker, National Oculoplastic Course, Xiamen City, China, March 31, 2013.

"Ophthalmic Plastic and Reconstructive Surgery", Invited Speaker, San Diego County Optometric Society Annual Meeting, San Diego, CA, March 21, 2013.

"Management of Lacrimal and Orbital Diseases", Visiting Professor, Beijing Tongren Eye Hospital, Capital Medical University, China, April 3, 2013.

"Challenging Cases in Oculoplastic Surgery." Invited Speaker, Grand Rounds, Division of Plastic Surgery, UC San Diego, CA, July 31, 2013.

"Complex Eyelid Reconstructions", "Converting to Endoscopic Lacrimal Surgery", "Management of Thyroid Orbitopathy" Keynote Speaker, Northwest Inaugural Oculoplastic and Orbital Disease Teaching Course. Xi'An Number 4 Hospital, Xi'An China. September 20, 2013.

"Complications of Blepharoplasty." Invited Speaker, Nashville Academy of Ophthalmology. Nashville, TN. October 28, 2013.

"Flap Techniques and Eyelid Reconstructions." Invited Speaker, Department of Ophthalmology, Vanderbilt University, October 29, 2013.

JEFF LEE, M.D.

"Ophthalmology for the Internist Part I", UCSD Internal Medicine Noon Conference, San Diego, CA, May 17, 2012.

"Ophthalmology for the Non-Ophthalmologist Part II", American Professional Coders Society, San Diego Branch Meeting, San Diego, CA, May 23, 2012.

"Ophthalmology for the Internist Part II", UCSD Internal Medicine Noon Conference, San Diego, CA, June 14, 2012.

New Resident Orientation, UC San Diego Department of Ophthalmology, San Diego, CA, July 2, 2012.

"Cataract Complications", CORE West Cataract Surgery Training Course, Carlsbad, CA, December 7-9, 2012.

"It's not that Big of a Deal", Ophthalmologic Case Presentation: UCSD MBB2 Medical School Core Curriculum Year 2, San Diego, CA, January 4, 2013.

"Ophthalmologic Principles and Syndromes", UCSD MBB2 Medical School Core Curriculum Year 2, San Diego, CA, January 9, 2013

"Ophthalmologic Disorders", UCSD MBB2 Medical School Core Curriculum Year 2, San Diego, CA, January 11, 2013.

"Interesting Cases from an Inpatient Ophthalmology Service", San Diego Eye Bank Ophthalmic Seminar, San Diego, CA, August 3, 2013.

"Ocular Emergencies", UC San Diego Department of Emergency Medicine Orientation, San Diego, CA, August 2013.

JAMES D. LINDSEY, Ph.D.

"The Role of RGC Mitochondria in Glaucomatous Optic Neuropathy", "Neuroprotection & Apoptosis of RGCs in Glaucoma", World Glaucoma Congress, Vancouver, Canada, July 2013.

"Innovative Approaches to Retinal Imaging in Rodents", "Of Mice and Men: What Can Animal Models Teach us About Glaucoma?", World Glaucoma Congress, Vancouver, Canada, July 2013.

JOHN HK LIU, Ph.D.

"Clinical Trials of Ophthalmic Drugs and Devices for Glaucoma Management", Biomedical and Clinical Research Seminar Series, UCSD Hillcrest campus, San Diego, CA, April 4, 2012.

"Intraocular Pressure: New Perspectives", Optometric Glaucoma Society 11th Annual Scientific Meeting, Phoenix, AZ, October 23, 2012.

"Nocturnal and Diurnal IOP", Optometric Glaucoma Society – American Academy of Optometry Joint Symposium, Phoenix, AZ, October 24, 2012.

"Visual Impairment in American Astronauts", National Taiwan University Hospital, Department of Ophthalmology, Taipei, Taiwan, January 8, 2013.

"Intraocular Pressure: New Measuring Devices and Instrumentation", Optometric Glaucoma Society/American Optometric Association Course, San Diego, CA, June 28, 2013.

"What Have We Learned About IOP During 20 Years from the Sleep Laboratory?", 5th World Glaucoma Congress, IOP Around the Clock (Measurement and Significance) Symposium, Vancouver, Canada, July 19, 2013.

FELIPE A. MEDEIROS, M.D., Ph.D.

"Measuring Glaucoma Progression", Keynote Speaker, MSD Glaucoma Symposium, Busan, South Korea, September 2012.

"Can We Better Assess Quality of Life Outcomes?", Faculty, Glaucoma Research Society Meeting, Wurzburg, Germany, September 2012.

"Structural and Functional Tests in Glaucoma", Faculty, Beyond IOP Symposium, Review of Ophthalmology, Chicago, IL, September 2012.

"Incorporating Structural Rate of Change", Faculty, American Academy of Ophthalmology, Glaucoma Subspecialty Day 2012, Chicago, IL, November 2012.

"A Paradigm Shift in the Detection of Glaucoma Progression" and "Let's Get Real: Testing what Really Matters in Glaucoma", Keynote Speaker, Sixteenth Rotterdam Glaucoma Symposium, Rotterdam, Netherlands, January 2013.

"Glaucoma Progression in Clinical Practice" and "When to Advance Treatment", Faculty, Managing Glaucoma: Beyond Intraocular Pressure Symposium, San Francisco, CA, April 2013.

"The Future of Glaucoma", "What Can We Learn from Counting Ganglion Cells", "New Perspectives on 24h IOP Measurements" and "Corneal Biomechanics in Glaucoma", Keynote Speaker, South African Glaucoma Congress, George, South Africa, May 2013.

"The 10 Commandments of Glaucoma", Keynote Speaker, 46 Reunion Annual Sociedad Dominicana de Oftalmologia, Punta Cana, Dominican Republic, June 2013.

"Detecting Glaucoma Progression: A Paradigm Shift", "Advances in 24h IOP Measurement" and "Let's Get Real: Testing What Really Matters in Glaucoma",Keynote Speaker, IV Congreso Sociedad Iberoamericana de Glaucoma, Punta Cana, Dominican Republic, June 2013.

"Innovations in Risk Assessment for Glaucoma Patients", Faculty, 41st Annual Ophthalmology Alumni Meeting, SUNY Downstate Medical Center, New York, NY, June 2013.

"Detecting Glaucoma Progression in Clinical Practice" and "Continuous 24 Hour IOP Measurement Faculty, 41st Annual Ophthalmology Alumni Meeting, SUNY Downstate Medical Center, New York, NY, June 2013.

"Biomarkers and Surrogate Endpoints in Glaucoma", "Should IOP Be Lowered When the Only Measured Abnormality is RNFL Thinning on Optic Nerve Imaging?", "Combining Structure and Function for Detection of Glaucoma Progression" and "Current Challenges in Glaucoma Clinical Research", Faculty, 5th World Glaucoma Congress, Vancouver, Canada, July 2013.

"What Can We Learn from Counting Ganglion Cells?", 2013 Loris and David Rich Lecture, University of Alabama at Birmingham, AL, August 9, 2013..

SHIRA ROBBINS, M.D.

"Retinopathy of Prematurity", UC San Diego Ophthalmology Residents, San Diego, CA July 2012.

"Vision Screening in Young Children", Child Health and Disability Prevention Program, Pediatricians/Optometrists/Nurses/Medical Assistants, October 2012.

"Children's Eyes: Developmental and Disease States", California Association of Orientation and Mobility Specialists Statewide Conference, San Diego, CA, November 2012.

"Pediatric Ophthalmology and Strabismus", OKAP Review Session, UC San Diego Ophthalmology Residents, San Diego, CA, March 2013.

"How to Read a Strabismus Montage", 3 lecture series, UC San Diego Ophthalmology Residents, San Diego, CA, May 2013.

"Vision Screening in Young Children", Child Health and Disability Prevention Program, Pediatricians/Optometrists/Nurses/Medical Assistants, June 2013.

"Retinopathy of Prematurity", UC San Diego Ophthalmology Residents, San Diego, CA, July 2013.

PETER J. SAVINO, M.D.

"Neuro-ophthalmology Review", Invited Guest Speaker, Wills Eye Institute Review Course, Philadelphia, PA, March 7, 2012.

"Evaluation of the Patient with Diplopia", "Pseudotumor Cerebri- Diagnosis and Management", "Giant Cell Arteritis", "Non-Arteritic Ischemic Optic Neuropathy- To Treat Or Not To Treat", "Clinical Case Presentations", Invited Guest Speaker, Curso Internacional de Actualizacion Oculoplastica de cara al future, Instituto de Oftalmologia, Mexico, DF, March 22-24, 2012.

"Transient Visual Obscurations", Invited Guest Speaker, 28th Singapore-Malaysia Joint Meeting in Ophthalmology, Singapore, June 15-16, 2012.

"Double Vision - When Is It Dangerous?", Invited Guest Speaker, Neuro-Oftalmologia: A basic and update course, Conegliano, Italy, October 13, 2012.

"Giant Cell Arteritis", Invited Guest Speaker, Ask the Expert Program, Wills Eye Institute, American Academy of Ophthalmology Meeting, Chicago, IL, November 11, 2012.

"Horner Syndrome - Con In Pro/Con Format for Pharmacologic Localization", Invited Guest Speaker, North American Neuro-Ophthalmology Society Symposium, American Academy of Ophthalmology Meeting, Chicago, IL, November 12, 2012.

"Giant Cell Arteritis", Invited Guest Speaker, North American Neuro-Ophthalmology Society Medical Malpractice Program, American Academy of Ophthalmology Meeting, Chicago, IL, November 12, 2012.

"Nystagmus", Clinical Symposium - Case Presentations, Invited Participant in Neuro-Ophthalmology Symposium and Neuro-Ophthalmology Course – the Royal Australian and New Zealand Collage of Ophthalmologists 44th Annual Scientific Congress, Melbourne, Australia, November 25-28, 2012.

"Neuro-Ophthalmic Diagnoses You Do Not Want To Miss", Invited Guest Speaker, Ophthalmology Update 2013, La Jolla, CA., February 16-17, 2013.

"Do You Need to Biopsy Suspected Giant Cell Arteritis?", "Protocol for Pseudotumor Cerebri", "Do Not Treat Non-Arteritic Ischemic Optic Neuropathy", "Masqueraders in Neuro-Ophthalmology", Invited Guest Speaker, VIII Curso de Actualizacion en Neuro-oftalmologia, Madrid, Spain, February 22-23, 2013.

GABRIEL SILVA, Ph.D.

"Theoretical, Computational and Experimental Considerations for Mapping Dynamic Neural Network Connectivity", q-Bio Summer School, Biocircuits Institute, University of California, San Diego, CA, July 30, 2012.

"What we Currently Understand about the Interface between Nanoscale Technologies and Neural Cells", Nanotechnology Approaches to Manipulating and Monitoring Neural Properties Symposium, Society for Neuroscience (SFN) Annual Meeting, New Orleans, LA, October 13-17, 2012.

"Opportunities and Challenges of Commercializing Nanotechnologies Aimed at Treating Neurological Disorders", The Business of Nanotechnology Symposium, Materials Research Society (MRS) annual meeting, Boston, MA, November 26-30, 2012.

"Nanotechnology Approaches for Neurostimulation and Restoring Function", Graduate Program in Neurosciences, Invited Speaker as chosen by the graduate students in the program, University of Minnesota, Minneapolis, MN, April 12, 2013.

"A Roadmap for Translational Nanomaterials and Technologies Aimed at Restoring Neurological Function", Invited plenary lecture, BioCom 2013, Perth, Australia, September 29-October 3, 2013

"High Density Optoelectronic Nanowire Array Selective Stimulation of the Neural Retina: Comparison with Other Neural Stimulation Technologies" Society for Neuroscience, San Diego, CA, November 2013.

ROBERT N. WEINREB, M.D.

"Mechanisms of Glaucoma Surgery", European Glaucoma Society Keynote Lecture, Copenhagen, Denmark, June 2012.

"Unmet Needs of Glaucoma", Founders Award Lecture, Optometric Glaucoma Society, Phoenix, AZ, October 2012.

"Translating Neuroprotection into a Clinical Trial", Joseph M. Bryan Lecture, Duke University School of Medicine, North Carolina, October 2012

"The Case for Angle Surgery", Fred C. Williams, M.D. Memorial Lecture, 54th Annual Scientific Meeting of Frederick C. Cordes Eye Society, University of California, San Francisco, CA, March 2013.

"Continuous 24-hr Monitoring of IOP", Kapetansky Lecture, University of Pittsburgh School of Medicine, Pittsburgh, PA, September 2013.

"The RGC Index to Diagnose and Monitor Glaucoma", Keynote Lecture, 36th Annual Midwest Glaucoma Symposium, Pittsburgh, PA, September 2013.

LINDA ZANGWILL, Ph.D.

"Métodos de Evaluación Estructural Aplicados a la Clínica Diaria: La Visión de Una Experta", XXXI Congreso Mexicano de Oftalmologia, Guadalajara, Mexico, June 10, 2012.

"Stratification of Normative Data", Food and Drug Administration-American Glaucoma Society Workshop on the Validity, Reliability and Usability of Glaucoma Imaging Devices, Bethesda, MD, October 5, 2012.

"Assessment of Structural Damage and Progression", Consejo Mexicano De Oftalmologia, Colegio Mexicano de Glaucoma, Acapulco, Mexico, May 2, 2013.

"Glaucomatous Progression in the African Descent and Glaucoma Evaluation Study (ADAGES)", Zangwill LM, Khachatryan N, Jain S, He F, Medeiros FA, Bowd C, Lisboa R, Weinreb RN, Liebmann JM, Girkin CA. ARVO Annual Meeting, Abstract 2655. Seattle, WA, May 5-9, 2013.

"New Ideas in Structure-Function Mapping", American Optometric Society Annual Meeting, San Diego, CA, June 28, 2013.

"Comparing the Rate of Rim Area Change in Eyes with Visual Field and Optic Disc Endpoints: The Confocal Scanning Laser Ophthalmoscopy Ancillary Study to the Ocular Hypertension Treatment Study", World Glaucoma Congress, Vancouver, Canada, July 17-20, 2013.

"Should We Have a Normative Database Based on Ethnicity?" World Glaucoma Congress, Vancouver, Canada, July 17-20, 2013.

"Assessing Structural Change in Glaucoma", Women in Ophthalmology Conference, Aspen, Colorado, August 1-4, 2013.

ASIA-Association for Research in Vision and Ophthalmology (ARVO) "The Rate of Structural Change in Glaucoma", Delhi, India, October 28-30, 2013

KANG ZHANG, M.D., Ph.D.

"Genetics of Retinal Diseases", Department of Human Genetics, Baylor College of Medicine, Houston, TX, February 2013.

"Stem Cell Therapy for Retinal Diseases", Angiogenesis, Exudation and Degeneration, Bascom Palmer Eye Institute, Miami, FL, February 2013.

"Stem Cell Therapy in the Eye", Annual Meeting of Chinese Retina Society, China, March 2013.

"Restoration of Vision", The Association for Research in Vision and Ophthalmology (ARVO), Invited Symposium, Seattle, WA, May 2013.

"Genetics and Epigenics of Retinal Deseases", the 20th Medical Retina Group Meeting, Oxford, UK, July 2013.

"Epigenetics in Aging and Eye Diseases", Gordon Institute, University of Cambridge, UK, July 2013.

"An Integrated Approach to Eye Research and Therapy", Department of Ophthalmology, Stanford University, Stanford, CA, September 2013.

"Genetics, Epigenetics and Stem Cell Based Approach in Age Related Macular Degeneration", Plenary Lecture, International Society of Ocular Cell Biology Conference, Oxford, England, September 2013.

"Basic Research and Translational Applications of Stem Cells", Annual Meeting of Chinese Ophthalmology Society, Xiamen, China, September 2013.

CLINICAL TRIALS

GLAUCOMA

Study to Assess Rapid Disease Progression by Clinical and Genetic Factors in Glaucoma Patients that are High Risk (STARFISH).
PI: Robert N. Weinreb, M.D.

Contribution of Genotype to Glaucoma Phenotype in African Americans.
PI: Robert N. Weinreb, M.D.

Evaluation of Driving Simulator and Behind the Wheel (On-Road) Performance in Patients with Glaucoma and Healthy Controls.
PI: Robert N. Weinreb, M.D.

Structural Changes in the Eye Following Glaucoma Surgery. PI: Robert N. Weinreb, M.D.

24-Hour Intraocular Pressure (IOP) Patterns of Glaucoma Patients before and after Cataract Surgery. PI: Robert N. Weinreb, M.D.

24-Hour Intraocular Pressure (IOP) Patterns of Glaucoma Patients before and after Selective Laser Trabeculoplasty (SLT).
PI: Robert N. Weinreb, M.D.

Evaluation of Visual and Task Performance in Patients with Glaucoma, Suspected of Having Glaucoma and Healthy Controls. PI: Robert N. Weinreb, M.D.

Clinical Studies of Swept-Source OCT.
PI: Robert N. Weinreb, M.D.

Pupil-Based Perimetry.
PI: Robert N. Weinreb, M.D.

An Age Stratified Data Collection Study in Adult Males and Females, Ages 18 and above to Establish a Normative Database Using the 3-D Optical Coherence Tomography 3-D Oct - 1000 Mark II. PI: Robert N. Weinreb, M.D.

Comparative Study of the Nidek Optical Coherence Tomography RS-3000 and the RTVue OCT Predicate Device for the Measurements of Retinal and RNFL Thickness, Optic Disc Analysis, Pachymetry, Anterior Chamber Imaging and SLO Imaging.
PI: Robert N. Weinreb, M.D.

Nidek Advanced OCT/SLO Systems, RS-3000 Nomative Data Collection Study. PI: Robert N. Weinreb, M.D.

Phase II Open Label Study Assessing the Safety and Ocular Hypotensive Efficacy of AR-12286 in Patients with Open-Angle Glaucoma or Ocular Hypertension.
PI: Robert N. Weinreb, M.D.

Amblyopia: Structural Maintenance and Critical Period Plasticity (Prospective Clinical Trial).
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Molecular Genetic Approach to Inherited Eye Diseases. Co-I: Jeffrey L. Goldberg, M.D., Ph.D.

Genetics of Ophthalmic Disease.
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Retinal Cell Culture: Survival and Regeneration (Prospective Clinical Trial).
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Corneal Endothelial Dysfunction: Retrospective Review – Chart Review.
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Treatment of Diabetic Retinopathy – Chart Review.
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Steroids and Laser Trabeculoplasty (SALT) Trial: Effect of Anti-Inflammatory Treatment on the Efficacy of SLT (Prospective Clinical Trial).
PI: Jeffrey L. Goldberg, M.D., Ph.D.

CNTF Implant for Glaucoma: A Phase I Study (Prospective Clinical Trial).
PI: Jeffrey L. Goldberg, M.D., Ph.D.

CNTF Implant for Ischemic Optic Neuropathy: A Phase I (Prospective Clinical Trial).
PI: Jeffrey L. Goldberg, M.D., Ph.D.

The Role of Retinal Nerve Fiber Layer Optical Coherence Tomography Data to Predict Future Visual Field Loss in Patients with Glaucoma – Chart Review.
PI: Jeffrey L. Goldberg, M.D., Ph.D.

Efficacy of 24-Hour Intraocular Pressure Fluctuation Recording with the SENSIMED Triggerfish® Contact Lens Sensor.
PI: John H.K. Liu, Ph.D.

24-Hour IOP-Lowering Effect of 0.01% Bimatoprost.
PI: John H.K. Liu, Ph.D.

A Randomized, Single-Center, Open-Label, Crossover Study Comparing the Efficacy of BOL-303259-X 0.024% (Latanoprostene Bunod) Ophthalmic Solution with Timolol Maleate Ophthalmic Solution 0.5% in Subjects with Open-Angle Glaucoma or Ocular Hypertension – CONSTELLATION Study.
PI: J. Rigby Slight, M.D., John H.K. Liu, Ph.D.

Evaluation of Bimatoprost 0.01% and Bimatoprost 0.03% in Patients with Glaucoma or Ocular Hypertension.
PI: Felipe Medeiros, M.D., Ph.D.

A Randomized, Multicenter, Double-Masked, Parallel-Group Study Comparing the Safety and Efficacy of BOL-303259-X 0.024% (Latanoprostene Bunod) Ophthalmic Solution with Timolol Maleate Ophthalmic Solution 0.5% in Subjects with Open-Angle Glaucoma or Ocular Hypertension – Lunar Study.
PI: Felipe Medeiros, M.D., Ph.D.

Topcon DRI OCT-1 Optical Coherence Tomography System for the Acquisition of Retinal Thickness Measurements and Ocular Images of the Posterior Chamber: Agreement and Precision Study.
PI: Felipe Medeiros, M.D., Ph.D.

An Open Label (Stage 1) and Randomized (Stage 2), 24-Month Study of Safety and Efficacy of Bimatoprost Drug Delivery System in Patients with Open-Angle Glaucoma or Ocular Hypertension.
PI: Felipe Medeiros, M.D., Ph.D.

Structural Changes in the Eye Following Glaucoma Surgery.
PI: Felipe Medeiros, M.D., Ph.D.

Evaluation of Driving Simulator and Behind the Wheel (On-Road) Performance in Patients with Glaucoma and Healthy Controls.
PI: Felipe Medeiros, M.D., Ph.D.

Comparison of Measurements of Intraocular Pressure Pre and Post Topical Ocular Hypotensive Treatment in Glaucoma Patients Using the Ocular Response Analyzer (ORA), Dynamic Contour Tonometry (DCT) and Goldmann Applanation Tonometry (GAT).
PI: Felipe Medeiros, M.D., Ph.D.

The Effects of the Water Drinking Test on Intraocular Pressure of Glaucoma Patients Undergoing 24-Hour Continuous Monitoring with the SENSIMED Triggerfish®.
PI: Felipe Medeiros, M.D., Ph.D.

Evaluation of Visual and Task Performance in Patients with Glaucoma, Suspected of Having Glaucoma and Healthy Controls.
PI: Felipe Medeiros, M.D., Ph.D.

Retinal and Peripapillary Blood Flow Assessment before and after Therapeutic Intervention in Glaucoma Using the Retinal Function Imager (RFI 3000 System).
PI: Felipe Medeiros, M.D., Ph.D.

RETINA

Age-Related Eye Disease Study 2 (AREDS2).
PI: Henry A. Ferreyra, M.D.

Home Vision Monitoring in AREDS2 for Progression to Neovascular Age-Related Macular Degeneration (AMD) Using the ForeseeHome Device (Sub-Study of AREDS2).
PI: Henry A. Ferreyra, M.D.

Tissue Processing and Confocal Microscopy.
PI: William R. Freeman, M.D.

A Double-Masked, Randomized, Active-Controlled Study of the Efficacy, Safety, and Tolerability of Intravitreal Administration of VEGF Trap-Eye (Intravitreal Aflibercept Injection [IAI]) in Patients with Macular Edema Secondary to Branch Retinal Vein Occlusion.
PI: William R. Freeman, M.D.

A Double-Masked, Randomized, Active-Controlled, Phase III Study of the Efficacy, Safety and Tolerability of Intravitreal Administration of VEGF.
PI: William R. Freeman, M.D.

A Phase II, Multicenter Randomized, Double-Masked, Placebo-Controlled, Parallel-Group Study to Investigate the Safety, Tolerability, Efficacy, Pharmacokinetics and Pharmacodynamics of GSK933776 with GA and AMD. PI: William R. Freeman, M.D.

A Multicenter, Patient-Masked, Safety Extension Study to Evaluate the Biodegeneration of the Brimonidine Tartrate Posterior Segment Drug Delivery System.
PI: William R. Freeman, M.D.

Protocol VGFT-OD 0910: An Open-Label, Long-Term, Safety and Tolerability Extension Study of Intravitreal VEGF Trap-Eye in Neovascular Age-Related Macular Degeneration.
PI: William R. Freeman, M.D.

A Double-Masked, Randomized, Active-Controlled, Phase III Study of the Efficacy and Safety of Intravitreal Administration of VEGF Trap-Eye in Patients with Diabetic Macular Edema. PI: William R. Freeman, M.D.

Multicenter Uveitis Steroid Treatment (MUST) Trial. PI: William R. Freeman, M.D.

Characterization of AIDS Associated Retinopathy in the HAART Era.
PI: William R. Freeman, M.D.

The Longitudinal Study of the Ocular Complications of AIDS Renewal.
PI: William R. Freeman, M.D.

Retina Patient Outcomes Registry and Prospective - Chart Review.
PI: William R. Freeman, M.D.

Study Evaluating Genotypes While Using Lucentis 2 (SEAGUL).
PI: Kang Zhang, M.D., Ph.D.

Genetic Assessment of Early to Late Macular Degeneration Study 2 (GALLEY).
PI: Kang Zhang, M.D., Ph.D.

Genetic Assessment of Early to Late Macular Degeneration Study 2 (GALLEY 2).
PI: Kang Zhang, M.D., Ph.D.

Clinical Assessment of Age-Related Macular Degeneration Patients after Early Diagnosis and Treatment with Ranibizumab (COMPASS).
PI: Kang Zhang, M.D., Ph.D.

Prospective Case Crossover Study to Assess Whether PDE5 Inhibitor Exposure in Men with Erectile Dysfunction Increases the Risk for the Development of Non-Arteritic Anterior Ischemic Optic Neuropathy (NAION).
PI: Kang Zhang, M.D., Ph.D.

A Phase III, Double-Masked, Multicenter, Randomized, Active Treatment – Controlled Study of the Efficacy and Safety of 0.5 mg and 2.0 mg Ranibizumab Administered Monthly or on an As-Needed Basis (PRN) in Patients with Subfoveal Neovascular Age-Related Macular Degeneration.
PI: Kang Zhang, M.D., Ph.D.

Ranibizumab (Lucentis) for Treating Submacular Vascularized Ped.
PI: Kang Zhang, M.D., Ph.D.

SEVEN Year Observational Update of Macular Degeneration.
PI: Kang Zhang, M.D., Ph.D.

Seven Year Observational Update of Macular Degeneration Patients Post Marina/Anchor and Horizon Trials (Seven UP Study).
PI: Kang Zhang, M.D., Ph.D.

PEDIATRIC OPHTHALMOLOGY

Retinopathy of Prematurity Education to Families of Neonates.
PI: Shira L. Robbins, M.D.

Visual Function in Preterm Infants with Regressed Retinopathy of Prematurity.
PI: Shira L. Robbins, M.D.

Vision Screening of Pre-Schoolers in the San Diego Community.
Consultant: Shira L. Robbins, M.D.

NEURO-OPHTHALMOLOGY

Functional-Structural Correlations in Eyes with Non-Glaucomatous Optic Neuropathies.
PI: Peter J. Savino, M.D.

OPHTHALMOLOGIC PLASTIC AND RECONSTRUCTIVE SURGERY

Loteprednol Etabonate Ophthalmic Ointment vs. Soothe Night Time Ointment for Inflammation. PI: Bobby S. Korn, M.D., Ph.D.

SHILEY EYE CENTER AWARDED PRESTIGIOUS NIH CORE GRANT

In July 2012, $500,000 in annual funding was secured from the National Eye Institute (NEI) for the "P30- Center Core Grant for Vision Research". Under the direction of the Principal Investigator and Director of the Center Core Grant, Linda Zangwill, Ph.D., this grant provides shared resources to enhance and accelerate the productivity of the vision research community at UC San Diego (UCSD). It will leverage the expertise of the 20 National Eye Institute funded UCSD investigators to advance discoveries from the 26 NIH funded major studies (known as a R01 grant).

The core grant also facilitates and enhances multidisciplinary collaboration among UCSD vision researchers and provides services that are unavailable or too expensive for individual investigators. Moreover, this core grant brings together faculty from other UCSD departments including Pediatrics, Pharmacology, UCSD's Center for Computational Sciences, Mathematics, Engineering, Neurosciences, Pathology, Computer Science and Mathematics, as well as from the California Institute of Telecommunications and Information Technology (CALIT2).

Important new resources and services are provided in four distinct substantive areas: 1) Vision Biostatistics, 2) Animal Structure and Function, 3) Computational Ophthalmology, 4) Tissue Processing and Confocal Microscopy. Module Directors include Felipe Medeiros, M.D., Ph.D., Dirk-Uwe Bartsch, Ph.D., Kang Zhang, M.D., Ph.D., William Freeman, M.D., LIngyun Chen, M.D., Linda Zangwill, Ph.D. and Sonia Jain, Ph.D.

The Vision Biostatistics Module provides integrated statistical services to vision researchers. The biostatistician, familiar with the statistical issues related to the analysis of vision research data will ensure quicker and more efficient analyses that will greatly enhance the productivity of the investigators.

The Animal Structure and Function Module provides two key resources to the vision research community – centralized animal structure and function

imaging and a trained technician with experience in handling these devices. Dedicated imaging instruments are too expensive for a single investigator. The sharing of this resource offers synergy and saves costs.

The Computational Ophthalmology Module supports computationally intensive analysis of structural imaging and functional tests used in animal and human vision research studies. These state-of-the-art computational and visualization resources with software tailored for vision research will support and thus accelerate discoveries in various vision research areas.

The Tissue Processing and Confocal Microscopy Module provides essential tissue processing and microscopy resources with custom software tailored for vision research to accelerate discoveries with the objective of preventing the blinding consequences of glaucoma and various retinal diseases.

Through the resources provided in this NIH Core Grant for Vision Research, new and established scientists at UCSD will take their internationally recognized vision research program to the next level of innovation and distinction.

GRANTS

COMPREHENSIVE OPHTHALMOLOGY

Cataract Surgical Education Grant
Jeffrey Lee, M.D. Alcon, 2013

CORNEA & REFRACTIVE SURGERY

A Genome Wide Association Study of Fuchs Endothelial Corneal Dystrophy
Natalie Afshari, M.D.
NIH/Center for Inherited Disease Research (CIDR)

Integrative Genetic Analyses in Fuchs Endothelial Cornea Dystrophy
Natalie Afshari, M.D.
NIH/NEI, 03/01/13-02/29/16

GLAUCOMA

Research to Prevent Blindness Unrestricted Grant
Robert N. Weinreb, M.D.
Research to Prevent Blindness Inc., 01/01/11-12/31/12 (NCE)

Sirtuins in Glaucomatous Optic Neuropathy
Robert N. Weinreb, M.D.
NIH/NEI, 01/01/11-12/31/13

ADAGES III: Contribution of Genotype to Glaucoma Phenotype in African Americans
Robert N. Weinreb, M.D.
NIH/NEI, 07/01/13-06/30/18

Diagnostic Innovations in Glaucoma Study: Structural Assessment
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 04/01/95-04/30/16

African Descent and Glaucoma Evaluation Study
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 09/30/02-08/31/13

Mitochondrial Dysfunction in Glaucomatous Optic Neuropathy
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 12/01/07-08/31/18

Short-Term Estimation of Long-Term Intraocular Pressure Reduction
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 07/01/08-06/30/14

African Descent and Glaucoma Evaluation Study II: Glaucoma Progression
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 02/01/10-01/31/15

New Techniques for Measuring Volumetric Structural Changes in Glaucoma
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 01/01/11-12/31/13

Diagnostic Innovations in Glaucoma Study: Functional Impairment
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 09/01/11-08/31/16

Predicting and Detecting Glaucomatous Progression Using Patterns Recognition
Robert N. Weinreb, M.D. (Co-Investigator)
NIH/NEI, 02/01/12-01/31/16

Predicting and Detecting Glaucomatous Progression Using Pattern Recognition
Christopher Bowd, Ph.D.
NIH/NEI, 02/01/12-01/31/16

Retinal Scaffolds: Synaptic and Stem Cell Integration
Jeffrey L. Goldberg, M.D., Ph.D.
NIH/NEI, 10/01/09-09/30/12

Electrospun Scaffolds for 3-D Retinal Tissue Engineering
Jeffrey L. Goldberg, M.D., Ph.D.
Interdisciplinary Research Development Initiative (UM), 07/01/10-08/31/12

Kruppel-like Transcription Factors in Retinal Ganglion Cell Regeneration
Jeffrey L. Goldberg, M.D., Ph.D.
NIH/NEI, 08/01/10-06/30/14

Triazine Compounds to Promote Regeneration in Optic Neuropathies
Jeffrey L. Goldberg, M.D., Ph.D.
NIH/OD, 06/01/11-05/31/13

Functionalized Magnetic Nanoparticles as a Therapeutic Tool to Improve Axon Regeneration after Stroke
Jeffrey L. Goldberg, M.D., Ph.D.
James and Esther King Foundation, 11/01/11-10/30/12

Signaling Scaffolds in Stroke
Jeffrey L. Goldberg, M.D., Ph.D.
NIH/NEI, 12/01/11-11/30/15

Catalyst for a Cure: Biomarker Initiative
Jeffrey L. Goldberg, M.D., Ph.D.,
Andrew Huberman, Ph.D.
Glaucoma Research Foundation, 02/01/12-01/31/15

Enhancing Optic Nerve Regeneration after Trauma
Jeffrey L. Goldberg, M.D., Ph.D.
DOD, 09/01/12-08/31/16

Cell Therapy for Retinal Ganglion Cell Loss in Glaucoma
Jeffrey L. Goldberg, M.D., Ph.D.
BrightFocus Foundation, 07/01/13-06/30/15

Timing the Treatment of Optic Nerve Injury
Jeffrey L. Goldberg, M.D., Ph.D.
DOD, 09/21/13-09/20/15

Molecular Determinants of Synaptic Target Choice in the Developing Visual System
Andrew Huberman, Ph.D.
The E. Matilda Zeigler Foundation for the Blind, 2010-2013

Restore Normal Function to Diseased Visual Circuits in Blinding Disorders
Andrew Huberman, Ph.D.
Knights Templar Eye Foundation, 2012-2013

Development of Retinofugal Parallel Pathways
Andrew Huberman, Ph.D.
NIH/NEI, 02/01/12-01/31/17

Genetic Dissection of Visual Perception in Mammals
Andrew Huberman, Ph.D.
The Whitehall Foundation, 2011-2012

Trans-Synaptic Circuits for Processing Directional Motion
Andrew Huberman, Ph.D.
The McKnight Endowment for Neuroscience, 2013-2015

Research on Retinal Ganglion Cells
Andrew Huberman, Ph.D.
Pew Charitable Trusts, 2013-2017

Mitochondrial Dysfunction in Glaucomatous Optic Neuropathy
Won-Kyu (Daniel) Ju, Ph.D.
NIH/NEI, 09/01/09-08/31/13

Mitochondrial Dysfunction in Glaucomatous Optic Neuropathy
Won-Kyu (Daniel) Ju, Ph.D.
NIH/NEI, 09/01/13-08/31/18

Fluid Distribution before, during and after Prolonged Space Flight
John H.K. Liu, Ph.D.

NASA Johnson Space Center, 08/01/12-07/31/15

Diagnostic Innovations in Glaucoma Study: Functional Impairment
Felipe A. Medeiros, M.D., Ph.D.
NIH/NEI, 09/01/11-08/31/16

African Descent and Glaucoma Evaluation Study (ADAGES)
Linda Zangwill, Ph.D.
NIH/NEI, 09/01/09-08/31/12 (NCE)

African Descent and Glaucoma Evaluation Study (ADAGES) II: Glaucoma Progression
Linda Zangwill, Ph.D.
NIH/NEI, 02/01/10-01/31/15

Diagnostic Innovations in Glaucoma: Structural Assessment
Linda Zangwill, Ph.D.
NIH/NEI, 05/01/11-04/30/16

Center Core Grant for Vision Research
Linda Zangwill, Ph.D.
NIH/NEI, 07/01/12-06/30/17

RETINA

Molecular Basis of Hereditary Retinal Degenerations
Radha Ayyagari, Ph.D.
NIH/NEI, 09/01/11-08/31/15

Mechanistic-Based Non-Invasive Assessment of Retinal Damage in HAART Era
Dirk-Uwe Bartsch, Ph.D.
NIH/NEI, 09/30/11-01/31/16

Porous Silicon Particles Ocular Safety and Ocular Pharmacokinetics of Avastin Loaded Delivery System
Lingyun Cheng, M.D., Ph.D.
Spinnaker Biosciences Inc., 09/01/11-08/31/16

Porous Silicon Particles for Sustained Intravitreal Drug Delivery
Lingyun Cheng, M.D., Ph.D.
NIH/NEI, 09/01/11-08/31/16

Testing and Evaluation of a Retinal Prosthesis
Lingyun Cheng, M.D., Ph.D.
Nanovision Biosciences Inc., 07/30/12-07/29/13

Age-Related Eye Disease Study II (AREDS II)
Henry A. Ferreyra, M.D.
EMMES Corporation/NIH/NEI, 04/12/07-12/31/12

Crystalline Antiproliferative Drugs for Intraocular Diseases
William R. Freeman, M.D.
NIH/NEI, 09/30/08-07/31/12

Studies of Retinopathy of Aids in the HARRT Era
William R. Freeman, M.D.
NIH/NEI, 04/01/10-03/31/14

Define Novel Genes for Diabetic Microvascular Complications
Kang Zhang, M.D., Ph.D.
Burroughs Welcome Fund Clinical Scientist Award in Translational Research, 07/01/08-06/30/13

Genetics and Functional Studies of Age-Related Macular Degeneration
Kang Zhang, M.D., Ph.D.
NIH/NEI, 09/30/08 - 08/30/14

ELOVL4 and Retinal Disease
Kang Zhang, M.D., Ph.D.
NIH/NEI, 11/01/08-04/30/13 (NCE)

Regeneration of Retinal Neurons by Chemically Induced Reprogramming of Muller Glia
Kang Zhang, M.D., Ph.D.
NIH/NEI, 09/30/10-09/29/15

Research to Prevent Blindness Senior Scientific Investigator Award
Kang Zhang, M.D., Ph.D.
Research to Prevent Blindness, 01/01/11-12/31/12

Regulation of the Hippo Pathway and its Role in Uveal Melanoma
Kang Zhang, M.D., Ph.D.
NIH/NEI, 09/01/12-08/31/17

Generation of IPS Lines for Blinding Eye Diseases
Kang Zhang, M.D., Ph.D.
California Institute for Regenerative Medicine, 08/01/13-07/30/15

OPHTHALMOLOGIC PLASTIC AND RECONSTRUCTIVE SURGERY

The Development of a Patient Reported Outcome Questionnaire for Symptomatic Exophthalmos Associated Thyroid Eye Disease
Don O. Kikkawa, M.D.
Lithera, 09/23/10-09/30/12

Loteprednol Etabonate Ophthalmic Ointment vs. Soothe Night Time Ointment in the Treatment of Inflammation Following Eyelid Surgery
Bobby S. Korn, M.D., Ph.D.
Bausch and Lomb Pharmaceuticals, 02/01/12-07/01/14

PATHOLOGY

Endoplasmic Reticulum Stress in Retinal Degeneration
Jonathan H. Lin, M.D., Ph.D.
NIH/NEI, 09/01/10-05/31/15

Stem Cell-Derived Retinal Pigment Epithelium to Treat Age-Related Macular Degeneration
Jonathan H. Lin, M.D., Ph.D.
BrightFocus Macular Degeneration Research Foundation Grant, 07/01/13-06/30/15

Ocular Biomarkers for Alzheimer's Disease Amyloid
Jonathan H. Lin, M.D., Ph.D.
Adlyfe, Inc., 05/01/11-09/01/13

PEDIATRIC OPHTHALMOLOGY AND EYE ALIGNMENT DISORDERS

Amblyopia Treatment Study
Shira L. Robbins, M.D.
Jaeb Center for Health Research/NIH/NEI, 05/01/04-12/31/13

GIVING OPPORTUNITIES

For almost 30 years, the philanthropic support from generous individuals, foundations and corporations has provided the Department of Ophthalmology with valuable resources for patient care, research, education and community service. The state of California provides less than 4% of our budget and therefore, we must rely on private gifts. As a friend of the Department of Ophthalmology, there are several giving options for those who wish to contribute to our tradition of excellence.

SUPPORTING THE DEPARTMENT OF OPHTHALMOLOGY

Outright Gifts
Immediate Impact

Outright gifts of all sizes made with cash, credit card, savings bonds, marketable securities or property provide immediate impact to our faculty and facility.

Annual Gifts
Circle of Sight

Founded in 1996, the *Circle of Sight* is the Shiley Eye Center's recognition program that acknowledges donors who make annual gifts of $250 or more to support the greatest needs of the Department. Several times a year, the Shiley Eye Center's *Circle of Sight* members are invited to attend Vision Research Lectures and receptions where members get to personally know our faculty. The members are also ambassadors for the Shiley Eye Center within the San Diego community. The *Circle of Sight* group is the backbone of many of our successful initiatives.

Planned Gifts
Your Vision for Tomorrow

Please consider a charitable bequest in your will, which benefits the future and directly supports the Department of Ophthalmology while saving your family estate tax dollars. We would be pleased to provide you, your attorney and your accountant or tax advisor, with specific bequest language for inclusion in your will or trust.

Tribute Gifts
Acknowledge Someone Special

Contributions can be made in memory, honor or celebration of a loved one or to commemorate a special occasion. Gifts can be made to honor a special physician, for example, who has played a significant role in your eye health. Such a gift creates a legacy and memorializes the person by providing direct support to the Department.

Matching Gifts
Double or Triple your Gift

Many employers offer a matching gift program to their employees meaning that your donations are worth even more. All you need is a Matching Gift Form from your employer.

Endowments
Gifts in Perpetuity

A gift of endowment demonstrates your long-term commitment to the Department of Ophthalmology since the fund is maintained in perpetuity. Your gift can support programs, lectures, awards, fellowships and Chairs. An endowment serves as an enduring legacy since it often bears the name of a donor or loved one.

Every donation makes an impact on our patients, faculty and staff, as well as the field of Ophthalmology. We cherish the partnership that we have developed with those generous members of the community who invest in us. There are also naming opportunities for gifts including: endowed chairs, laboratories, specialized ophthalmic clinics and research initiatives. We would welcome the opportunity to have a confidential conversation with you, so we clearly understand how you want your gift to be used.

For further information, please contact:

Karen Anisko Ryan
Phone: 858-534-8017
Email: kanisko@ucsd.edu

PHYSICIAN THINKS OF SHILEY'S FUTURE

As a retired physician, Trude Kahn Hollander, M.D. understands the importance of meticulous attention to detail. She wanted to ensure that her assets would be utilized in a meaningful way after her passing. Dr. Hollander decided to generously make arrangements in her estate plan to benefit the UC San Diego Department of Ophthalmology and Shiley Eye Center by funding the Dr. Trude K. Hollander Endowed Chair in the Division of Ophthalmic Plastic and Reconstructive Surgery.

Dr. Weinreb stated, "We appreciate Dr. Hollander's generosity for choosing the UC San Diego Shiley Eye Center to leave her lasting legacy towards our future growth, innovation and success".

Trude K. Hollander, M.D. was born in 1910 in Offenburg, Germany and grew up along the Rhine River and Black Forrest. She completed her medical degree in Bonn and was one of four women to graduate in a class of 120. Dr. Hollander left Germany before World War II to complete her internship at Mount Zion Hospital in San Francisco. She then moved to Massachusetts and became board certified in gynecology. She practiced in Springfield where she met her husband Alfred, a prominent dermatologist. Dr. Hollander had a successful career for 45 years before retiring with her husband to San Diego in 1979. Her beloved Alfred passed away in 1987. Trude stays active and vibrant by having many friends, exercising daily, traveling, reading, doing crossword puzzles and attending the San Diego Symphony among other social events and concerts.

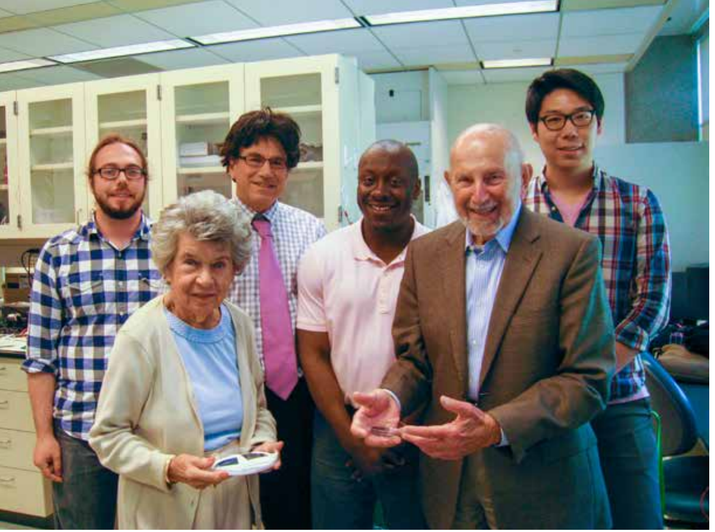
Trude first came to know Don O. Kikkawa, M.D. as a patient at the UC San Diego Shiley Eye Center in the late 1990's and they have remained close friends ever since. She regularly comes to see Dr. Kikkawa and over time has developed a special relationship with his family as well. Trude believes, "Dr. Don Kikkawa is and always has been the perfect example of a true physician who makes a difference. He is not only equipped with an extraordinary pair of hands and eyes which bring healing for the most complicated and rare eye conditions. He has been my idol from the moment I met him. I soon recognized him also as a model husband and father."

"Trude is an extraordinary person. Her grace, beauty and generosity are unparalleled. I have been extremely blessed to be her friend and am so touched and grateful for her kindness", said Dr. Kikkawa.

The Shiley Eye Center's Circle of Sight membership group and Dr. Kikkawa honored Trude with a special lecture and reception on March 13, 2013 to celebrate her 103rd birthday. Dr. Kikkawa's lecture, entitled "Aging Gracefully" was presented to a standing room only audience. "Trude Hollander, M.D. is truly a stunning example of how to age gracefully and elegantly," says Dr. Kikkawa.

At UC San Diego, endowed chairs honor exceptional faculty members for their contributions to academia and support their current work. They are also essential for attracting and retaining star faculty to the department. The Department of Ophthalmology at the Shiley Eye Center presently has five endowed chairs and with Dr. Hollander's gift, the future is promising as ever. If you are interested in making an estate gift, please contact Karen Anisko Ryan at 858-534-8017 or kanisko@ucsd.edu.

(above) **Dr. Don Kikkawa and his children Claire, Jason and Alina with Dr. Trude Hollander**



LONGTIME FRIEND ENCOURAGES THE DEPARTMENT

A new collaboration between the UC San Diego Shiley Eye Center, the UC San Diego Department of Bioengineering and the Moxie Foundation of San Diego has created an ophthalmic medical incubator program. This new program was initiated by Florence Zahn, Director at the Moxie Foundation, through her longtime association with Robert N. Weinreb, M.D., Director of the Shiley Eye Center and Chair of the Department of Ophthalmology.

Florence and Dr. Weinreb were neighbors more than fifty years ago. They came back into contact when Florence and husband Irwin Zahn moved to San Diego. She became a patient at the Shiley Eye Center after another neighbor directed her to where Dr. Weinreb was practicing and described his worldwide reputation. Florence observed his outstanding clinical practice and cutting edge research and wanted to further stimulate the scientific ventures at the Shiley Eye Center.

According to Dr. Weinreb, "This innovative program seeks to "dream, design and develop" patient-centered medical devices to improve the vision-related quality of life of patients with potentially blinding eye diseases such as glaucoma, macular degeneration and diabetic retinopathy."

Initiating the program, Dr. Weinreb is working with Todd Coleman, Ph.D., Associate Professor of Bioengineering at UC San Diego and graduate students to develop a miniature electronic device to enhance patient use of their prescription eye drops. Dr. Coleman stated, "The work we are doing is novel and has a high likelihood of improving patient treatments for several eye diseases."

The Moxie Foundation is dedicated to enriching and empowering individuals and communities by advancing educational achievement and entrepreneurial success, personal health and the environment. The Department is grateful to the Zahns and the Moxie Foundation for their support.

(left) **Dr. Robert N. Weinreb, Dr. Todd P. Coleman, Florence and Irwin Zahn with graduate students Michael Bajema and Yun Soung Kim**

RE-OPENING OF THE RATNER

When a main pipeline underneath a building ruptures, it typically causes horrific damage to the interior of the building. Such was the case on January 7, 2012 when that very thing happened to the Anne F. and Abraham Ratner Children's Eye Center on a Saturday when the building was closed to patients and no staff was present.

The pressure from the water ripped through the foundation and within minutes, the entire building sustained 6-8 inches of muddy water. An on-duty security officer walking his rounds noticed water and mud oozing from underneath the doors. The officer was able to get the water turned off but not before immense damage had taken its toll on the entire interior infrastructure. The faculty and staff in the Division of Pediatric Ophthalmology were then moved into temporary offices and clinical space at the Shiley Eye Center while the pain-staking work to replace walls, flooring, carpeting, equipment, furniture and cabinets took place.

Nine months later, the interior of the Ratner Eye Center had been completely revitalized with new earth-tone color schemes, hard-wood and cork flooring, modern furniture and updated equipment to enhance the family friendly atmosphere. The Ratner has been operating with the new features while both the adult and children patients appreciating the changes.

On April 23, 2013, University of California, San Diego leaders and Ratner and Foster family and friends gathered to celebrate the reopening of the Ratner Children's Eye Center. UC San Diego Chancellor Pradeep Khosla and Director of the Shiley Eye Center Robert N. Weinreb, M.D. delivered opening remarks showing their gratitude to the family who helped rebuild the center.

Dr. Weinreb stated, "We are honored that Pauline Foster is continuing her family legacy in supporting the renovations of the Ratner Children's Eye Center".

Director of the Ratner Children's Eye Center and Anne Ratner Chair in Pediatric Ophthalmology, David B. Granet, M.D. brought the crowd to tears with his heartfelt reflection on the memory and generosity of Anne Ratner as well as her daughter Pauline Foster. "Few of us ever get to live a life that impacts others. Anne & Pauline as well as the entire family have permanently altered the care of children once again. On behalf of the children of San Diego, the Southwest, the entire US and the world I am honored to be the one who says Thank You!"

Preventing and treating vision loss and ocular problems in children is the highest priority in the Division of Pediatric Ophthalmology at the Anne F. and Abraham Ratner Children's Eye Center which originally opened in 1995. The Ratner physicians, David B. Granet, M.D. and Shira L. Robbins, M.D. treat over 5,000 adult and child patients annually.

(right middle) **Dr. David Granet, Pauline Foster and Dr. Shira Robbins**

(right bottom) **Dr. Robert Weinreb, Chancellor Pradeep Khosla, Paul Viviano, Pauline Foster, Dr. David Brenner, Dr. Stuart Brown and Dr. David Granet**

"We are honored that Pauline Foster is continuing her family legacy in supporting the renovations of the Ratner Children's Eye Center"

- Dr. Weinreb

The Honor Roll for the Department of Ophthalmology gratefully acknowledges donations from June 1, 2012 to August 31, 2013. Thank you to all of the individuals, foundations and corporations listed below.

Gifts of $500,000 & Above

Hildyard Family Trust
Dr. Trude K. Hollander
Dorothy R. Kerrigan Trust

Gifts of $100,000 to $499,999

Eleanor & John Barbey, Jr.
David J. Dunn
Pauline Foster
Research to Prevent Blindness
Shiley Awards in Health Education and the Arts funded by Donald & Darlene Shiley
Florence & Irwin Zahn

Gifts of $50,000 to $99,999

Rita & Richard Atkinson
Bob & Peg* Boemer
Giovanni Bucolo Family Foundation
The California Endowment
Wayne Green
Michel Mathieu
Irvin Olson & Rita A. Olson Trust
Price Family Charitable Fund
Armi & Al Williams

Gifts of $10,000 to $49,999

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Miriam Neuhauser Charitable Remainder Trust
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The Prudential Foundation Matching Gifts Program
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Gifts of $5,000 to $9,999

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The Halpin & Helen O'Reilly Charitable Trust
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Stephen Wax & Laurie Price

Gifts of $1,000 to $4,999

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Paul Blodgett & Birgitta Granberg
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Pamela Bruder
Dorothy R. Conte
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Anne & Walter Dempsey
Dorothy & Jacob Ettinger
Mark T. Fay, M.D.
Elsa & George Feher
Connie Frank
Kathleen & Albert Fredman
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