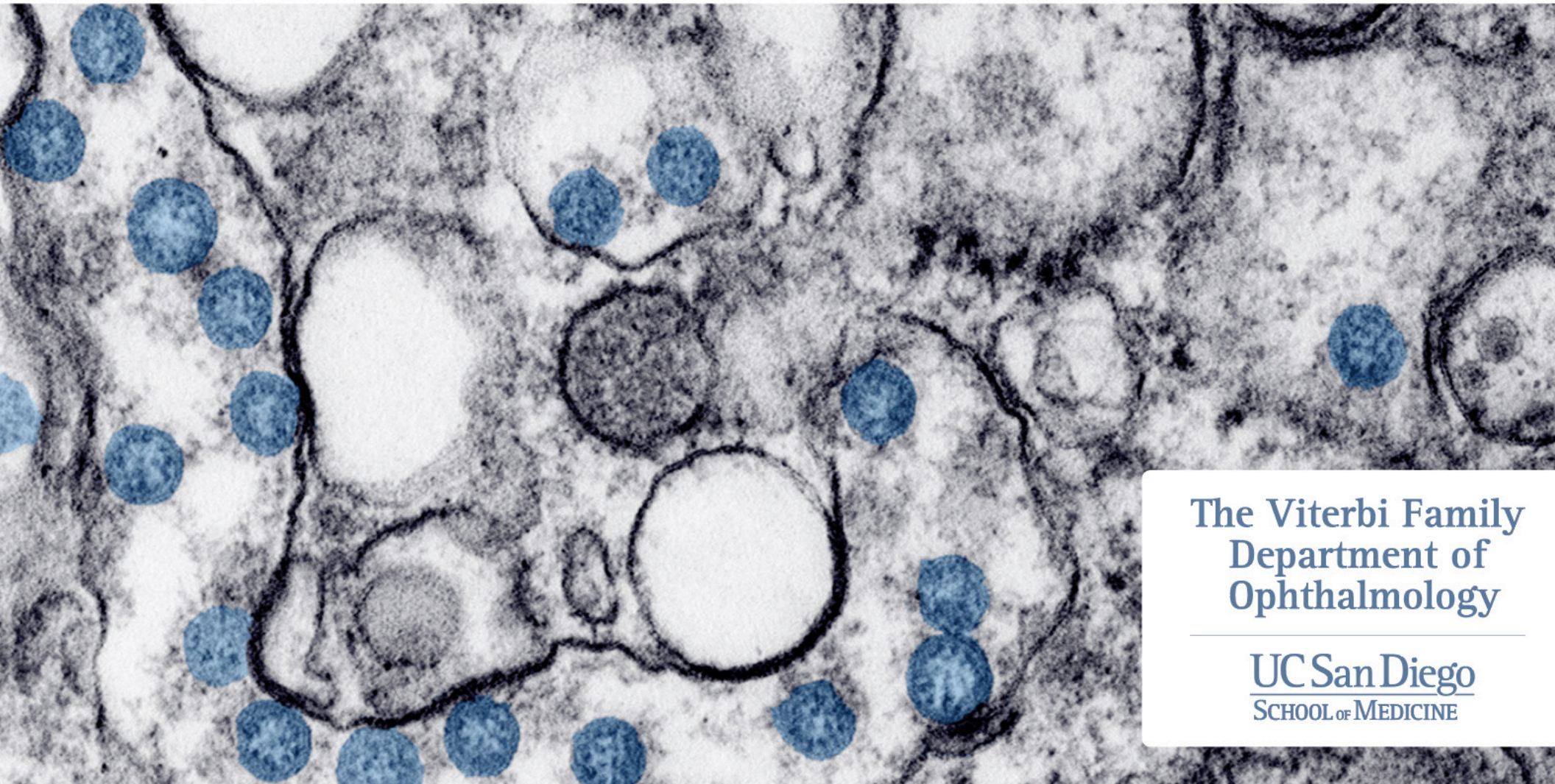


Shiley Eye Institute

FOR SIGHT

2020 Annual Report



The Viterbi Family Department of Ophthalmology

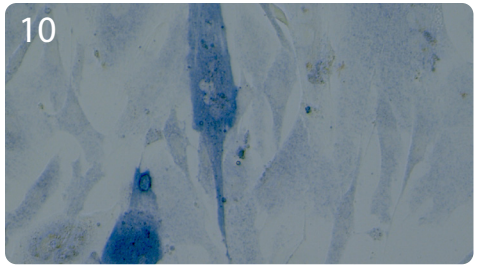
UC San Diego
SCHOOL OF MEDICINE



SIMPLY WORLD CLASS

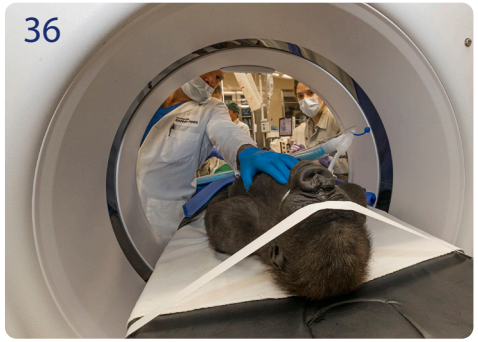
The Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego offers treatment across all areas of eye care. Our world class clinicians, surgeons, scientists and staff are dedicated to excellence and providing the best possible patient care to prevent, treat and cure eye diseases. Our research is at the forefront of developing new methods to diagnose and treat 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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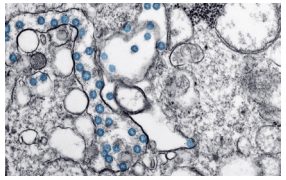








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FRONT COVER IMAGE:
Transmission electron microscopic image of an isolate from the first U.S. case of COVID-19, formerly known as 2019-nCoV. The spherical viral particles, colorized blue, contain cross-section through the viral genome, seen as black dots.



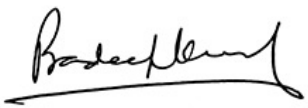
Letter from the **Chancellor**

Dear Friends,

In this especially challenging year, UC San Diego is innovating to meet the needs of our students and patients and adjusting to our new reality so we can maintain our pursuit of groundbreaking discoveries. The Shiley Eye Institute and Viterbi Family Department of Ophthalmology at UC San Diego Health are shining examples. The tireless efforts of the faculty, staff, and clinical teams ensured that San Diegans continue to receive the very best in ophthalmic care under unprecedented circumstances. And our researchers are moving full steam ahead with pioneering work that is helping to advance our understanding of the most complex vision issues.

This year as we celebrate the founding of UC San Diego 60 years ago, we also celebrate the accomplishments of the Shiley Eye Institute, which has been a defining feature of our university for nearly half of its history. Thanks to your ongoing support, we have built a resilient, world-class hub of exceptional vision care and expertise. This report is filled with news and stories from the past year that illustrate a holistic approach to improving vision health through patient-centered care, leading-edge collaborative research, and community outreach. We are incredibly grateful for your contributions toward these efforts, and for the lasting impact you are making at UC San Diego.

With kind regards,



Pradeep K. Khosla, PhD
Chancellor, UC San Diego



Letter from the **Chair**

Dear Friends,

2020 was like no other year. Nearing its end, we reflect on a year filled with both challenge and change. Things we took for granted are no longer possible. Sadly, a simple hug, a handshake or a visit to a restaurant is no longer part of our day-to-day life. Masks and social distancing are now the new normal.

While the world around us continues to change, one thing remains the same – namely, the commitment and compassion of clinicians and staff at the Shiley Eye Institute (SEI). Throughout the pandemic, I am proud that we have remained dedicated to our patients, showing flexibility and resilience in facing the unpredictable and often unimaginable hurdles of the global public health crisis.

As you will read in ***For Sight 2020***, we decided very early in March to continue being available to our patients during these extraordinary times. The safety of patients and staff are now, and always will be, our highest priority. Stringent screening procedures for patients and staff were initiated and adopted for entry into the Shiley Eye Institute. We led the way creating and strictly following new guidelines for masking, health screening, social distancing and cleaning. We designated members of our team to have the sole responsibility for disinfecting our waiting and examination rooms to meet the most exacting safety standards. Telemedicine video visits were ramped up. Most importantly, our clinics and operating rooms remained open for those in need. Each member of Team Shiley rose to the occasion and all deserve a heartfelt thanks.

A number of other notable activities were initiated. For example, the Shiley EyeMobile for Children was repurposed as a triage unit during school closure. In *For Sight 2020*, you will learn how an innovative and thoughtful student from our community helped SEI clinicians by creating and producing personal protective equipment that was in short supply.

Also highlighted in *For Sight 2020* how vision scientists in the Viterbi Family Department of Ophthalmology collaborated with SEI clinicians to simulate COVID-19 symptoms in the eye by utilizing stem cells. And while adapting to new health and safety guidelines, our researchers continued their groundbreaking investigations in glaucoma, macular degeneration and corneal disease. Partnership and dedication - both are at the core of how we provide our world class care.

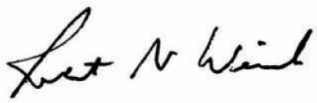
We all became ZOOM experts as weekly educational conferences and other meetings no longer were held in person, but instead took place virtually. Interestingly, attendance "zoomed" several-fold as we were joined by alumni from throughout the United States and around the world. As COVID-19 first became part of the daily conversation, we even went virtually to Wuhan and Beijing, epicenters of the pandemic, for cutting edge advice from SEI alumni, who now are in leadership positions there.

It has been a challenging year, yet also a year for internal reflection about ourselves and our loved ones. I am inspired by patients of all ages who astonish me with their encouragement, positive attitudes, determination and big hearts. I also am inspired by the spirit of Team Shiley that excelled throughout in their patient care, vision research, education of trainees and service to the community.

Just this week, we learned that safe and effective vaccines are on the horizon, and we can look forward to returning to the life that always has been taken for granted. In the meantime, I am fully confident that the inspiring individuals that make up the Shiley Eye Institute and Viterbi Family Department of Ophthalmology will continue to exceed expectations in their respective roles no matter what the future.

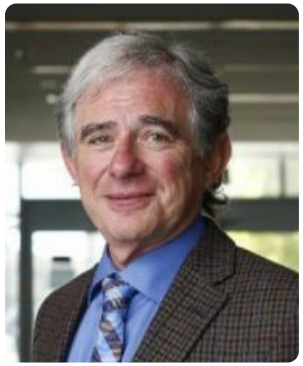
Please stay safe and be well.

Sincerely,



Robert N. Weinreb, MD
Director, Shiley Eye Institute
Distinguished Professor and Chair,
Viterbi Family Department of Ophthalmology





Letter from the **Vice Chancellor & Interim Dean**

Dear Friends,

The past year has been a tumultuous one as we face one of the most complex healthcare challenges of our time. The global pandemic has highlighted the critical importance of our tripartite mission: improving health through innovative research, education, and patient care. As part of the region's only academic medical center, the faculty and staff in the Viterbi Family Department of Ophthalmology and Shiley Eye Institute are critical to delivering the innovative, compassionate care that is a hallmark of UC San Diego.

Despite the challenges created by the pandemic, we are thrilled to celebrate another year of achievement by our distinguished faculty. From driving innovation through leading-edge translational research to training a diverse set of residents and fellows in the latest treatment options across all areas of eye care, the Viterbi Family Department of Ophthalmology and Shiley Eye Institute remain among the premier destinations for ophthalmology in the nation.

Thank you for your commitment to ensuring UC San Diego remains a leader in delivering outstanding patient care, pursuing diverse avenues of research through collaborative team science, and offering an exceptional academic environment for our students and trainees. Your support of the Viterbi Family Department of Ophthalmology and Shiley Eye Institute is vital to these efforts, and we remain deeply grateful for your partnership.

David Brenner, MD
Vice Chancellor,
UC San Diego Health Sciences

Steven R. Garfin, MD
Interim Dean,
UC San Diego School of Medicine



Letter from the **CEO**

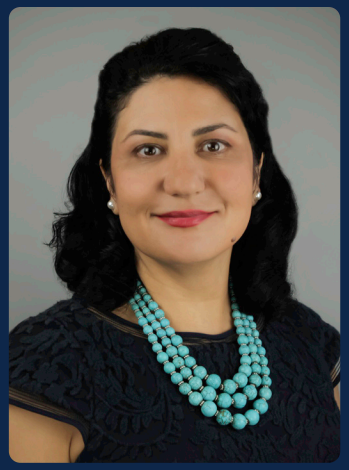
The Shiley Eye Institute and Viterbi Family Department of Ophthalmology are at the forefront of vision expertise and excellence in eye care, and it is this excellence that draws patients from across Southern California and around the world to seek out the specialized care that exists only at UC San Diego Health.

This year, the COVID-19 pandemic forced medical institutions across the globe to re-evaluate how they deliver care. I am incredibly proud of the work done by the clinical teams and faculty leadership at the Shiley Eye Institute and the Viterbi Family Department of Ophthalmology to ensure that patients can receive the care they need in a safe environment. Even as we continue to navigate through the pandemic, patient care remains our number one priority.

We continue to expand our ophthalmology offerings — thanks to your generous support — and increase patient access to our dedicated faculty whose work continues to inform and enhance research and the quality of care our patients receive. From treating potentially blinding eye diseases such as diabetic retinopathy, macular degeneration and glaucoma to discovering pathways to improve patient health on a broader scale, our clinical teams and faculty advance the field of ophthalmology every day.

Thank for you for supporting the ingenuity of our teams and their pursuit of vision restoration and comprehensive vision care.

Patty Maysent, MPH, MBA
CEO, UC San Diego Health






EXECUTIVE COMMITTEE

Top Row (L to R)

ROBERT N. WEINREB, MD | CHAIR
NATALIE A. AFSHARI, MD | VICE-CHAIR
DON O. KIKKAWA, MD | VICE-CHAIR
WILLIAM FREEMAN, MD | VICE-CHAIR

Bottom Row (L to R)

DAVID B. GRANET, MD | VICE-CHAIR
SALLY BAXTER, MD, MSc
CRAIG KISHABA, MBA | VICE-CHAIR

19 SHILEY FACULTY MEMBERS RANK AMONG THE TOP WORLDWIDE

Expertscape has recognized 19 members of Shiley Eye Institute as experts or world experts in one or more medical conditions.

This is a particularly noteworthy distinction, as expertscape uses data from the National Institute of Health's Pubmed database to identify and objectively rank physicians and researchers as experts based on topic, condition and diagnosis. Shiley Eye Institute faculty are highly-ranked in over 160 discrete medical areas in ophthalmology, surgery, medicine, and research.

To be considered an expertscape expert, the faculty member needs to be ranked among the top 1% worldwide in research and publications in a specific medical topic, and to be recognized as an expertscape world expert requires being in the top 0.1% worldwide.

expertscape

2020 WORLD EXPERTS



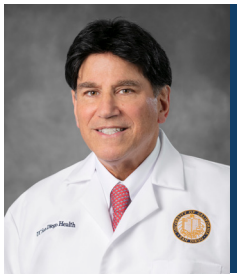
(L to R):
Napoleone Ferrara, MD
Don O. Kikkawa, MD, FACS
Bobby S. Korn, MD, PhD, FACS



(L to R):
Sasan Moghimi, MD
Robert N. Weinreb, MD
Linda M. Zangwill, PhD

2020 EXPERTS

Natalie A. Afshari, MD, FACS
Radha Ayyagari, PhD
Dirk-Uwe Bartsch, PhD
Akram Belghith, PhD
Shyamanga Borooah, MD, PhD
Christopher Bowd, PhD
Daniel L. Chao, MD, PhD
Lingyun Cheng, MD
William R. Freeman, MD
David B. Granet, MD, FAAO, FACS, FAAP
Huiyuan "Hannah" Hou, MD, PhD
Eric Nudleman, MD, PhD
Shira L. Robbins, MD, FAAO, FAAP



#1 World Expert in Glaucoma
Robert N. Weinreb, MD

2020 SHILEY YEAR IN REVIEW



534
RESIDENTS & FELLOWS TRAINED SINCE 1972 FROM
38
COUNTRIES

1 DAY - 108 YEARS
PATIENT AGE SPAN

110,454
PATIENT VISITS

4,482
SURGERIES

238,803
EYEMOBILE FREE VISION SCREENINGS IN SAN DIEGO COUNTY SINCE 1999

49
CLINICAL TRIALS

72
GRANTS

185
PUBLICATIONS

106
LECTURES

990
FREE DILATED EXAMS BY THE EYEMOBILE

760
FREE GLASSES GIVEN BY THE EYEMOBILE

RESEARCH IN THE TIMES OF **COVID-19**

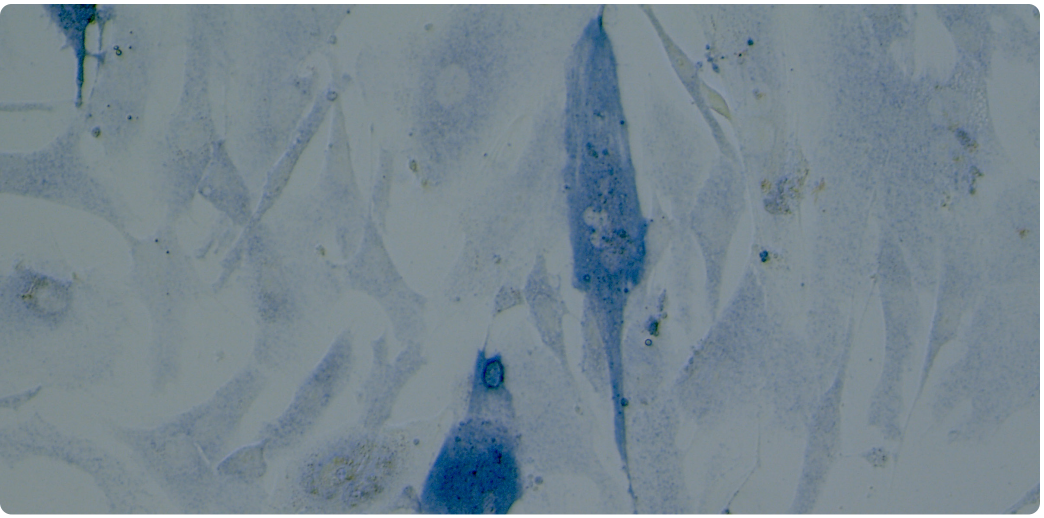
Pink eye is an initial symptom that some individuals with the COVID-19 disease (official name for the virus SARS-CoV-2) experience. This raises the possibility that the eye, much like the lungs, might also be a gateway for disease transmission.

Soon after the COVID outbreak, Shiley Eye Institute physicians and researchers **Karl Wahlin, PhD**, **Natalie Afshari, MD**, Brad Barnett, MD, **Dan Chao, MD, PhD**, **Derek Welsbie, MD, PhD** and **Doran Spencer, MD, PhD** convened weekly meetings to discuss what is known about COVID and eye transmission. The sobering conclusion was that the field knew little about the actual mode of transmission of this disease. New research was needed!

In an effort to begin studying COVID in the eye, Dr. Wahlin's research group used human stem cell-based 3-dimensional corneal organoid technology that his laboratory developed to test whether COVID could be transmitted to human ocular tissues.



Human corneas generated from pluripotent stem cells (above) offer a potential way to study how COVID-19 can infect the cornea.



Partnering up with Jair Lage de Siqueira-Neto, PhD, an infectious disease expert at the SKAGGS School of Pharmacy at UC San Diego, they infected these cells and showed for the first time that laboratory grown human corneas could be readily infected with COVID. This now provides researchers a new way to explore COVID transmission in human tissues.

The group plans to adapt this new 3-D technology as a platform to screen FDA approved drug compounds that can potentially block viral transmission.

(Left) Cells isolated from laboratory grown organoids were infected with active SARS-COVID19 virus and labeled with antibodies that recognize the viral protein.

SEI PARTNERS WITH UC SAN DIEGO BIOENGINEERING STUDENTS

UC San Diego has tremendously talented students that can address real world problems with creative solutions. Every year, the Department of Bioengineering (BENG) holds a year-long senior design project that pairs students with faculty advisors to develop a project from initial conception to a working prototype.

Karl Wahlin, PhD advised a team of highly motivated students (Devansh Agarwal, Garret Almeida, Johhny Koo, Haojin Chen, Meghna Bahry and Kha Nguyen) this year to build 3-D printed self-feeding cell culture prototypes that will feed stem cell generated human retina organoids (and other cells). Not only will this reduce the amount of labor involved to carry out this work, but it is expected to lead to more reliable results for future experiments.

The work that the BENG team is doing addresses a major bottleneck in stem cell research and will have a lasting impact well after COVID has vanished. Shiley Eye Institute scientists collaborating with other UC San Diego departments accelerate the pace of discoveries and development of novel devices.





(Right) Biomedical engineering students testing the flowrate of a 3D printed microfluidic device.

SHILEY HEROES

A tribute to our frontline clinical staff that continue to serve our patients during the COVID-19 pandemic 2020







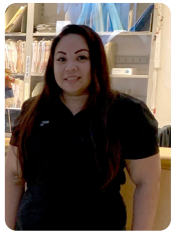

















FRONT DESK
Elham Antar
Nicole Colmenero
Andrea Lloyd
Aaron Meza-Beltran
Joycelyn Quinto
Alychia (Lai) Parr-Hasten
Adriana Reyes
Clarissa Velez
---*Not pictured*
Deanne Lopez

MEDICAL RECORDS
Kenneth Alfaro
Elizabeth Flores
Aleksandra Milosevic
Francisco Salgado
M. Aida Sosa
---*Not pictured*
Dionicia Perez

SHILEY CLINIC
Jerry Almario
Juan Arias
Juan David Arias
Kimberly Blythe
Kevin Brooks
Jeanette Chan
George Cunanan
Dora Frayre
Yesenia Gonzalez-Zavala
Aida Haile
Jayla Hudson
Luisa Larsen
Manuel Urrutia Menchaca
Joy McDonald
Leslie Medina
Evelyn Melendez
Sabrina Morales
Felecia Myers
Tiffeny Nguyen
Justin Nunez
Ivett Ocampo
Cory Ortiz
Lauren Pearce
Bill Ramirez
Kevin San Juan
Paripoorna Sharma
Jodi Simeroth
Brandon Tamayo
Laura Tandet
Elizabeth Tejeda
Jenny Trinh
Clarissa Velez
Rashmi Waiba Lama
Elexis Webster
Cristina Whitney
Miguelina Yafchak
Ginia Zinicola

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Nancy Le
Dana Madrid

JACOBS RETINA CENTER
Nancy Booth
Paula Khim
Veronica Mendoza
--*Not pictured*
Pamyla Emory

HAMILTON GLAUCOMA CENTER
Veronica Rubio
Matthew Salcedo
Walter Siqueiros Garcia
Eunice Williams-Steppe

RATNER STAFF
Erika Acera
Jo Adamcik
Janely Mendoza
Marie Montez
Gustavo Wanderer

EYEMOBILE
Rod Cruz
Leslie Espinoza
Juan Gonzalez
Margarita Guzman
Eric Hernandez
Iliana Molina, MBA
Jaqueline Su Yuo

HILLCREST EYE CARE
Maribel Bravo-Valles
Jorge Chavez
Citlallie Hernandez Palomino
Luana Ortega

PERLMAN CLINIC
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Annaleah Ariola
Angelina Destephanis
Diana Olguin
Alejandra Olvera
Jennalyn Urmanita
Marlene Rico
---*Not pictured*
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Giorgio Siqueiros

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Minerva Romero
Stacy Sanchez
Lesley Taylor
--*Not pictured*
Rebecca Limon
Janelly Mendoza
Raven Scott



TELEHEALTH @ SEI

In response to the COVID-19 crisis, the Shiley Eye Institute (SEI) doctors are finding ways to care safely for their patients, including telehealth. Live two-way audiovisual visits are offered with some of our providers to limit person-to-person contact. These "virtual" visits take place on a smartphone, computer or tablet using specialized software at UC San Diego Health.

Not all eye health concerns can be addressed via telehealth but we have made great efforts, particularly in triage, optometry, pediatric ophthalmology and neuro-ophthalmology.

Our first telehealth pediatric ophthalmology patient was seen on April 2, 2020 with **Shira Robbins, MD**, Professor of Ophthalmology at the Anne F. and Abraham Ratner Children's Eye Center. From Dr. Robbins perspective:

Our video visit has a virtual waiting room where ophthalmic technicians, Marie Montez or Gustavo Wanderer, "check in the patient," ask the reason for the visit and obtain a medical history. Orthoptist Erika Acera then performs a live eye movement exam followed by the medical examination performed by pediatric ophthalmology fellow Kirsta Brummel, DO.

I have been watching the full visit on my computer screen so I can then ask follow up questions and perform any additional examination before providing a final diagnosis and treatment plan. Before the visit, patients are asked to check their vision with the phone application (app) Kay iSight or a paper chart that we send and to photograph their eye movements with an app called 9 Gaze. This does not replace the greater accuracy of an in-person exam but allows us to take care of our non-urgent patients in this time of pandemic.

In the Viterbi Family Department of Ophthalmology, we are always looking for better ways to care for our patients. I was lucky to have a great group at Ratner to assist me in launching this new system. Thank you to my outstanding telehealth team: Marie Montez, Gustavo Wanderer, Erika Acera, Kirsta Brummel, DO and Andrea Johnson.

When it comes to eye health, telehealth sometimes makes it challenging to diagnose and treat patients. However,

sometimes there is no alternative. A patient called with new symptoms of double vision but refused an in-person visit because of fears about COVID-19.

"I had a video visit with her that day and diagnosed a new onset sixth nerve palsy, a disorder that causes your eye to cross inward towards your nose. There are many possible causes but because she also had vertigo, I was concerned for a significant brain disease," said Dr. Robbins. "I ordered an immediate MRI. The scan revealed a giant brain aneurysm. We then transferred the patient to neurosurgery and endovascular surgery all through telehealth. It can work with the right patient and right set up. I am so glad she called - as we likely saved her life."

She continued, "I plan to continue some telehealth visits for certain types of patients going forward. I love that COVID-19 made me try something new which I will continue to use to care for patients long after the pandemic is over."





SHILEY EYEMOBILE FOR CHILDREN

COVID-19 severely impacted the ability for the UC San Diego Shiley EyeMobile for Children to travel in the community to see youngsters around San Diego in the school locations. During the initial closure of schools, the EyeMobile was transformed into a mobile triage unit stationed in front of the Shiley Eye Institute and staffed by optometrists in full personal protective equipment. The doctors were able to examine patients that were suspected of having COVID-19 symptoms which allowed the Shiley clinic to remain available by limiting exposure to our other patients.

While the EyeMobile was being utilized as a triage unit, the staff completed comprehensive compliance calls to all of the families of children who wear glasses. Unfortunately, it was evident that many of the children had left their glasses in their closed classrooms. Therefore, the EyeMobile team quickly swung into action by replacing all of those glasses that were left behind. The parents were followed up with and given further information on the importance of wearing glasses and their children's development.

We are happy to report that COVID-19 didn't completely close down the EyeMobile. In the summer, the EyeMobile began scheduled visits to various cities in the county maintaining our mission - *that all children have access to high quality vision care*. The fact that children are not attending school in classrooms does not mean they do not need the EyeMobile services. Although a different model, the EyeMobile is continuing to provide no cost exams and glasses to children ages 3-14 in community locations around San Diego County.

STUDENT DOES HIS PART TO KEEP EYE DOCTORS **SAFE**

Inspired by stories of health care workers in dire need of personal protective equipment (PPE), Bishop's School sophomore Justin Korn decided to join the battle against COVID-19.

Justin's father, **Bobby Korn, MD, PhD**, Professor of Ophthalmology at the UC San Diego Shiley Eye Institute, recounted the story of Dr. Li Wenliang. He was an ophthalmologist and one of the first physicians in China to sound the alarm about this novel viral illness spreading throughout his country. Unfortunately, he succumbed to the disease at the young age of 33. Justin began to question his father about why eye doctors in particular are at high risk. Dr. Korn explained that the procedures of performing eye exams and treatments are in close proximity to patients.

Simultaneously, Dr. Korn was discussing the same issue with **David Granet, MD,** Professor and Director of the Ratner Children's Eye Center. Both observed that the standard face shields worn across the forehead do not allow ophthalmologists to carefully examine the retina or to check the refractive state of children's eyes in a safe manner. One can wear an N95 mask but then cannot use the specialized equipment that eye doctors utilize every day and still protect the eyes and face from aerosolization of the virus. Justin overheard the conversation and took up the challenge!

Justin's first challenge was to design a safeguard that would integrate a face shield with an indirect ophthalmoscope (the microscope that allows visualization of the structures inside the eye) that is already mounted around the forehead. At that time, there was no commercially available face shield that will couple with an indirect ophthalmoscope. One can wear a standard face shield but it cannot be used simultaneously with an indirect, especially if one wears glasses.

Justin took measurements of the device and designed a prototype on a 3D modeling program. Within a few hours, he





created a working model from his 3D printer. The first designs were too flimsy and didn't provide enough side protection so he went back to the drawing board and came up with several new iterations. He finally settled on a model that could be quickly produced and hold up to the stresses of daily clinical use. Justin then spent every waking hour printing as many indirect ophthalmoscope shields as he could.

Shortly after delivering shields to the Shiley Eye Institute, Justin was contacted by **Shira Robbins, MD**, Professor of Ophthalmology at the Ratner Children's Eye Center. Dr. Robbins asked Justin to create a specialized facial shield for a device she uses to check the refractive state of children's eyes (whether glasses are needed). This handheld device, known as a retinoscope, is used in close proximity to a child's eyes and this distance poses risks for the patient and doctor. Again, Justin went back to his design lab and fabricated a new model on his 3D printer. In just a few days, he had produced enough for the Ratner Children's Eye Center.

Justin has since produced ophthalmic shields for doctors at the VA San Diego Health Care System and has made his designs freely available at the National Institute of Health (NIH) 3D Print Exchange (3dprint.nih.gov). The FDA has authorized the use of 3D printed face shields under the Emergency Use Authorization (EUA).

(Far Left) Justin Korn studying an indirect ophthalmoscope and a standard face shield

(Left) L to R: Bobby Korn, MD, PhD, Justin Korn, Doran Spencer, MD, PhD, and Darren Knight, MD



Oliver Solis, OD, a community optometrist at San Ysidro Health which was heavily affected by COVID-19, contacted the Shiley Eye Institute in response to our social media postings. He requested and received ophthalmic shields made by Justin Korn at no cost.

Dr. Solis commented, "The pandemic revealed that we are all very much interconnected and that personal protective equipment helps to stop the spread of this virus. Fortunately there are people like Justin Korn who rose to the challenge. He really made a difference during this crisis. Thank you Justin and Dr. Korn for helping us through this pandemic. We are grateful for your assistance."

SHILEY ALUM VOLUNTEER IN NYC DURING COVID-19

Kyle J. Godfrey, MD





We are so proud of Kyle J. Godfrey, MD, Shiley Resident Alumnus 2014-2017 and former Chief Resident, for his work treating COVID-19 patients in New York City. He is currently an Assistant Professor of Ophthalmology at Weill Cornell Medicine and New York-Presbyterian in New York, NY and was featured in EyeNet Magazine – Profiles from the Pandemic.

EMERGENCY DEPARTMENT VOLUNTEER

Q. HOW HAS THE PANDEMIC CHANGED YOUR SHORT-TERM PRIORITIES?

The pandemic quickly forced me to think in units of hours and days instead of months and years. As a new faculty member, my priorities had been building my clinical practice, research team, and educational efforts. My eyes were focused down the road on things like our new multidisciplinary, endoscopic orbital surgery course. Suddenly, as COVID-19 swept through New York, we lost our sense of horizon. My priorities simplified and my focus sharpened on each day. I prioritized maintaining my health and finding creative ways to engage, support, and educate our community. Substituting long-term vision for short-term focus has helped me put one foot in front of the other and keep moving forward. I have also tried to practice daily gratitude for my health, for the health of my family, and for having a job that allows me to help others.

Q. WHAT ARE YOU DOING NOW THAT YOU WOULD NOT HAVE DONE OTHERWISE?

In addition to telemedicine, virtual lectures, and limited emergency orbit and oculofacial surgeries, I am volunteering as an attending physician in the emergency department (ED). In this new role, I am caring for COVID-19 and appropriate general emergency patients to help decompress clinical volume. This effort is supporting and bolstering the ranks of emergency clinicians who have been tirelessly and courageously caring for the influx of sick patients at multiple hospitals.

Q. HOW DID YOU GET INVOLVED?

As the clinical volume surged in New York, our chairman asked for volunteers to support the hospital mission, and I agreed to help. At that time, the need was in the ED. Although I was initially intimidated by the thought of returning to an emergency medicine role, the support I received made for an effective transition.

Q. WHAT ARE THE BIGGEST REWARDS?

Without question, the gratitude of my new emergency medicine patients and colleagues means a lot. The reception I receive each day in the ED and in our hospital—applause, food donations, chalk messages on the sidewalk, notes from patients—provide a tangible sense of purpose and solidarity. The coordinated hospital response has also been a reminder for me that medicine is a team sport. In ophthalmology, we often function in small, highly specialized units at some distance from the rest of medicine. However, being a part of the hospital's massive, coordinated response at the front lines of this crisis reminded me how much more powerful and effective we can be when collaborating, communicating, and working together for a common purpose. To see our hospital system not just survive but also take care of our community at the highest level has been a huge reward, and I know it has set an example for other departments around the city and country.

Q. WHAT ARE YOUR GREATEST CONCERNS?

My greatest concern had been that at the peak of the local curve we would not have sufficient resources or space to care for everyone who came through our doors. Thankfully, due to the exceptional efforts and leadership at our hospital, this did not happen. We have been well protected and well organized, and we have been able to care for everyone with a remarkably high level of success. Secondarily, I also empathize with any concerns our residents and fellows are feeling about their own training experiences (although none have expressed anything other than a desire to help). However, our residents and fellows are fortunate to have a dynamic and high-volume learning environment, and I am confident that they will graduate as competent and well-trained clinicians and surgeons.

Q. WHAT ARE YOUR BIGGEST CHALLENGES DAY TO DAY?

Although I miss operating and the daily interactions with my colleagues in our department, I have enjoyed the new challenge of clinical work in the ED. Quickly transitioning to a new field pushed me cognitively, physically, and emotionally, but it has been tremendously rewarding. From a clinical perspective, the COVID-19 treatment algorithms have been effective in guiding our coordinated, resource-efficient response, and they have contributed to our success. Additionally, the support of the staff, including technicians, nurses, nurse practitioners, physician assistants, residents, and attending physicians in the ED has been crucial to my ability to care for these sick patients.

Q. WHAT DO YOU SEE AS THE IMPACT OF WHAT YOU ARE DOING?

I am only playing a small role in a large and complex group effort, but I think standing shoulder to shoulder with my new ED colleagues helped reinforce for them that no department, clinician, or patient will be left behind, and that we are all pushing back against the tide of this disease together.

Q. WHAT'S YOUR PERSPECTIVE ON THE PANDEMIC?

I think the perennial importance of positivity, gratitude, and service have emerged for me. Although the losses are overwhelming, I think we can all find reasons to be positive. This perspective empowers us for the important work ahead. From a place of gratitude, I think we are all capable of contributing something. I have been inspired by the creative ways people have found to serve others and contribute. I am also continually inspired by the work of all essential employees who have kept our hospital, city, and country going. From transit workers to grocers to police officers, I have tried to say thank you at every opportunity.

Q. WHAT ARE YOUR THOUGHTS ON BEING AN OPHTHALMOLOGIST DURING THE COVID CRISIS?

From a medical perspective, a crisis of this magnitude requires us to contribute our full effort, at the top of our training, to the areas of greatest need. Our first impulse must be to help in every way possible. Although we are fortunate to have highly specialized microsurgical skills that allow us to prevent and cure blindness, we were first physicians trained in the diagnosis and treatment of systemic illness. We have more to offer our patients than we may initially believe.



GRATEFUL PATIENT

NATALIE BELLER

"I took this photograph in July when I realized that I would actually see the beautiful markings on the butterfly!" wrote grateful patient Natalie Beller.

As a youngster in New Jersey, Natalie Beller had a serious eye injury – she was shot in the right eye with an arrow and had several eye surgeries to fix the eye. As she got older, she was told that although she did not have glaucoma, her optic nerve suggested that she may develop it later in life. She had it checked each visit with her ophthalmologist.

Natalie was diagnosed with glaucoma in the 1990's while living in San Antonio and proceeded with the standard medical treatment of eye drops to reduce her pressure. For the next 20 years, she relocated across the US and changed careers from a systems analyst to professionally singing to public relations for a classical radio station.

Glaucoma is an eye disease that can cause vision loss and blindness from damage in the optic nerve at the back of the eye. Penetrating eye trauma can lead to optic nerve damage and increased eye pressure. The trauma can also make the eye more vulnerable to glaucoma and is called traumatic glaucoma.

More recently, Natalie retired to Santa Fe, New Mexico to pursue art full time. "I moved to Santa Fe to enjoy the gorgeous sunsets, interesting skies and fabulous light – all of which are very inspiring for my art", she stated. Her main focus is painting but she is always taking photographs of her surroundings. She has created steel and ceramic sculptures, masks, painted with pastels, as well as produced art installations.

While painting in her studio, she realized that she was only seeing in 2D in the upper nasal quadrant of her right eye. Quickly she recognized that her glaucoma had slowly and silently progressed. She went to her ophthalmologist in Dallas, who placed a shunt in her right eye to reduce pressure.

Due to the increased severity of her glaucoma and delicate condition of her eyes, she decided to seek a new ophthalmologist. With a friend, she searched for the best physician in the US for glaucoma treatment and they chose Robert N. Weinreb, MD at the Shiley Eye Institute (SEI).

Upon her first visit to SEI in February 2020, she was told that she needed to have surgery but was apprehensive about losing visual acuity in her left eye because she was an artist. Dr. Weinreb gave her odds on her chances with or without surgery. "I understood Natalie's concerns most especially since she is an artist but felt confident that we could help her keep her vision sharp," stated Dr. Weinreb.

I want this story to make the path easier for others who may have similar eye situations. I hope this enables them to envision successful outcomes.

- Natalie Beller

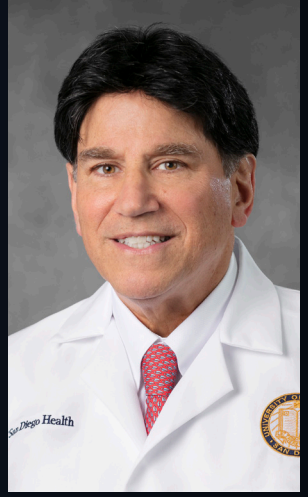
Natalie chose to pursue the glaucoma surgery, and it was successful. Then COVID-19 hit the US which made her going back and forth from New Mexico a little more challenging. Even with the traveling, Natalie felt safe coming for post-operative appointments to the Shiley Eye Institute during this difficult time.

In July, Natalie came back for another examination and presented Dr. Weinreb with a colorful photo (see pictured.) She wrote, "Thank you so much for all you have done to maintain my vision which allows me to continue to work in my studio."

With regards to her vision prospects for the future she states, "I am much more positive that I will keep my vision. I'm so thankful for the amazing results of my surgery, which allow me to continue to create art, and appreciative of the knowledge, skill, dedication and professionalism of everyone involved in my care at the Shiley Eye Institute."

NARROWING RACIAL HEALTH DISPARITIES THRU TECHNOLOGY @ SEI





(Left) Todd Coleman, PhD and (Right) Robert N. Weinreb, MD

Glaucoma is the world's leading cause of irreversible blindness in more than 70 million people. In the United States, certain groups are at the highest risk of developing the disease, particularly Black American and Latino individuals who are older than 40 years.

Although there are several different methods for treating glaucoma, the majority of patients take prescription eye drops one or more times daily to lower eye pressure and prevent damage to the optic nerve. Unfortunately, adherence with eye drops is poor with patients overestimating their own use compared with instructions from their eye doctor. Many factors are thought to complete to an individual's poor adherence to their prescribed regimen including the lack of symptoms, lack of understanding of the disease process, and the need for lifelong treatment and cost.

SEI faculty **Robert N. Weinreb, MD** and **Todd Coleman, PhD (**Professor of Bioengineering and Ophthalmology**)** believe that health information technology offers a solution for reducing disparities and have proposed a ground-breaking new study called iGLAMOUR (innovations in Glaucoma Adherence and Monitoring of Under Represented minorities) utilizing a flexible electronic eyedrop sensor to generate data on patients' adherence to taking eye drops.

This sensor transmits to a patient's cell phone with the ability to track treatment. Moreover, it will let them and their doctor how they are doing and remind them to use their eye drops as directed. In addition, this information will be accessible through their electronic medical record. An early donation from the Moxie Foundation offered collaboration opportunities with the UC San Diego Department of Bioengineering in creating this unique patented device.

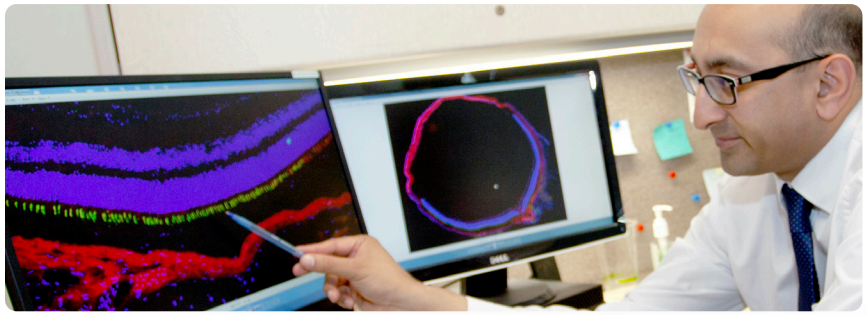
The UC San Diego multidisciplinary team working with Drs. Weinreb and Coleman include **Sally Baxter, MD, MSc**, Camille Nebeker, EdD, MS (Department of Family Medicine and Public Health), Lucila Ohno-Machado, MD, PhD (Chair, Health Department of Biomedical Informatics) and James Proudfoot, MS.

Glaucoma represents an ideal application for the use of health Information Technology to reduce racial disparities. Success of this innovative culturally tailored study will improve medication adherence and slow disease progression among minorities. Moreover, it is hoped that it will narrow racial health disparities with respect to medication adherence and improving patient outcomes in glaucoma.

GROUNDBREAKING TECHNOLOGY
at the New Retinal Degeneration Center

Retinal degenerations are the leading cause of blindness in the world and include diseases such as age-related macular degeneration (AMD) and inherited diseases such as retinitis pigmentosa (RP). Many of these diseases, such as dry AMD, are currently untreatable. With the advancement of personalized medicine, there is a huge opportunity to prevent sight loss and restore vision to individuals with retinal degeneration. Recent breakthroughs have led to the development of new treatments for some retinal degenerations. Additionally, a number of novel therapies are currently being tested which show early promise in saving sight.

The new UC San Diego Retinal Degeneration Center is led by **Shyamanga Borooah, MD, PhD** (pictured below).



The primary aim of the UC San Diego Retinal Degeneration Center is to provide world-class clinical care for patients with retinal degeneration in the region. The center will be fully focused on patient needs and will use state of the art diagnostics, as well as next-generation genetic testing, genetic counseling and visual rehabilitation.

Another key feature of the UC San Diego Retinal Degeneration Center will be the seamless integration of translational research. Patients will have the opportunity to participate in ground-breaking clinical studies such as gene therapy and gene editing. Recently, the Shiley Eye Institute was approved to take part in clinical trials using CRISPR gene editing.

The discovery of CRISPR led to the recent award of the Nobel Prize in science. CRISPR cutting edge technology allows the precise editing of faulty genes to correct genetic diseases. The Shiley Eye Institute is taking part in one of the first trials of CRISPR in humans in an attempt to treat an inherited form of retinal degeneration. The hope is that success in this new technology and similar clinical trials, will lead to a range of new therapies to treat retinal degeneration.

RETINAL DEGENERATION CENTER TEAM

LEAD – Shyamanga Borooah, MD, PhD
CLINICIAN/SURGEONS – Henry Ferreyra, MD & Eric Nudleman, MD, PhD
GENETICS RESEARCH AND BIOBANK – Radha Ayyagari, PhD
STEM CELL SCIENTIST – Karl Wahlin, PhD
COMMUNITY VISION LIAISON – Margarita Guzman
GENETIC TESTING – Qais Zawaydeh, MBBcH
DATABASE MANAGER AND CHIEF TECHNICIAN – Manuel Urrietta
ELECTROPHYSIOLOGY AND DARK ADAPTOMETRY – Miguelina Yafchak
VISUAL FIELDS AND MICROPERIMETRY – Aida Haile, COT
CLINICAL TRIAL TEAM – Iliana Molina, MBA



SEI DIVERSITY, EQUALITY & INCLUSION

Diversity, equality, and inclusion are core values for the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego. We aim to promote a culture of equality across every segment of our workplace. Empowering all individuals and encouraging diverse representation will enhance our ability to serve our communities in the clinic locally and globally, perform groundbreaking research, and inspire teaching for the next generation of physicians and scientists in vision and eye care.

The Department has formed a Diversity, Equality and Inclusion Committee that includes: **Sally Baxter, MD, Msc** (Chair), **Todd Coleman, PhD**, Medi Eslani, MD, **Henry Ferreyra, MD**, Aida Haile, COT, **Don Kikkawa, MD**, Darren Knight, MD, Daniel Ozzello, MD, Adeleh Yarmohammadi, MD, Kaileen Yeh, MD, and **Linda Zangwill, PhD**.

Diversity, equality, and inclusion are core values for our department. This committee is dedicated to fostering an inclusive environment for patients, employees, and trainees alike. We aim to promote a culture of equality across all segments of our workplace. Empowering all individuals and encouraging diverse representation will enhance our ability to serve our communities, perform groundbreaking research, and inspire teaching for the next generation of physicians and scientists in vision and eye care.

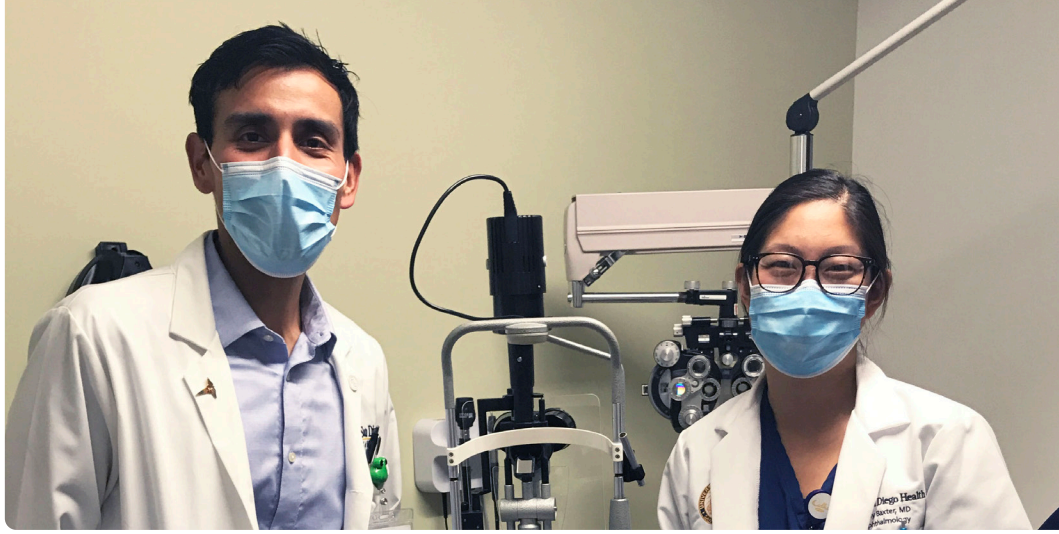
The Committee is working in conjunction with UC San Diego Health Sciences and School of Medicine as well as the UC San Diego campus to address systemic inequities. As part of this effort, they are engaging in a range of training programs and initiatives. They also have mentorship programs and outreach activities for trainees and staff from traditionally under-represented groups.

For many years, departmental faculty have supported the American Academy of Ophthalmology (AAO) Minority Ophthalmology Mentoring Program, which provides a dynamic mentoring program for underrepresented in medicine (URiM) students, including one-on-one mentorship, guidance in medical career planning, networking opportunities, and access to educational resources. Several faculty members are volunteer mentors in the program.

The Department participates in the UCSD MSTAR program which supports diverse medical students interested in vision science and ophthalmology research. This is a fully funded summer research experience for medical students between their first and second years of training. There is a wide array of ophthalmology faculty who serve as research mentors for this program. Students from traditionally underrepresented groups are especially encouraged to apply.



Henry Ferreyra, MD and Sally Baxter, MD, MSc



Ivan Copado, 2nd-year medical student and Co-Chair of the UC San Diego Latino Medical Students Association (LMSA), and Sally Baxter, MD, MSc

Questions about diversity in the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego are welcomed. Please contact Dr. Sally Baxter at s1baxter@health.ucsd.edu.

WELCOME NEW STAFF

Welcome to Catherine 'Cathi' Lyons, Shiley's Director of Ophthalmology Services, overseeing the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego's main La Jolla clinic, Hillcrest Vision Care clinic and Perlman Oculoplastic clinic.

Cathi started in January 2020 and has ensured smooth running clinics during this challenging time of COVID-19. She oversees the day-to-day administrative management while maximizing productivity, as well as the follow up with faculty and staff implementing precautionary measures and guidelines for the safety of our patients.

She is a San Diego native and has been working in Ophthalmology for over 35 years. She received her BA in Psychology from the University of Redlands, her MHA in Healthcare Administration from National University and has her COE (Certified Ophthalmic Executive). She has 15 years of experience as a supervising technician and has been a COT (Certified Ophthalmic Technician) since 1985.

Cathi states, "I am very happy to be joining the UC San Diego Ophthalmology family and honored to be working with the dedicated physicians and staff here at Shiley who provide excellent patient care. Learning about all of the amazing research being done has only added to this great experience."

She is passionate about affirmative and caring patient experience during the ophthalmic continuum of care. Her goal is to keep internal communication open for all frontline employees, increase efficiency within the clinics and engage patients and staff in a positive safe working atmosphere.

Her work philosophy is captured in a simple phrase from Lao Tzu, *Give a man a fish and you feed him for a day. Teach him how to fish and you feed him for a lifetime*. She goes on to say, "The quote reminds me to mentor along the way so that others will learn and develop - striving to be the best at what you do each day will make everyone around you better as well."



FACULTY SPOTLIGHT

NATALIE A. AFSHARI, MD



Natalie A. Afshari, MD, FACS, Professor of Ophthalmology, is the Chief of Cornea and Refractive Surgery and Vice Chair of Education. She is also the Stuart I. Brown, MD Chair in Ophthalmology in Memory of Donald P. Shiley. She is an award-winning clinician, surgeon, educator and a research scientist.

Dr. Afshari's achievements in cornea and refractive surgery and patient care have been recognized by her peers in several of the "best doctors" lists, including "The Best Doctors in America" every year for the past decade. Recently, she was recognized by the American Medical Women's Association with the prestigious "Woman in Science Award" for her exceptional contributions to medical science, through her basic research, publications and leadership in the field. She has been honored with the Academic Achievement Award and the Secretariat Award by the American Academy of Ophthalmology (AAO) as well as being named a "Gold Fellow" from the Association for Research in Vision and Ophthalmology.

She was asked to consult for the U.S. Food and Drug Administration (FDA) for her expertise on safety and efficacy of various ophthalmologic treatments. The National Institutes of Health (NIH) have honored Dr. Afshari and collaborators by awarding them extensive grant support (R01) to study Fuchs' Endothelial Corneal Dystrophy, a genetic disorder leading to corneal transplantation.

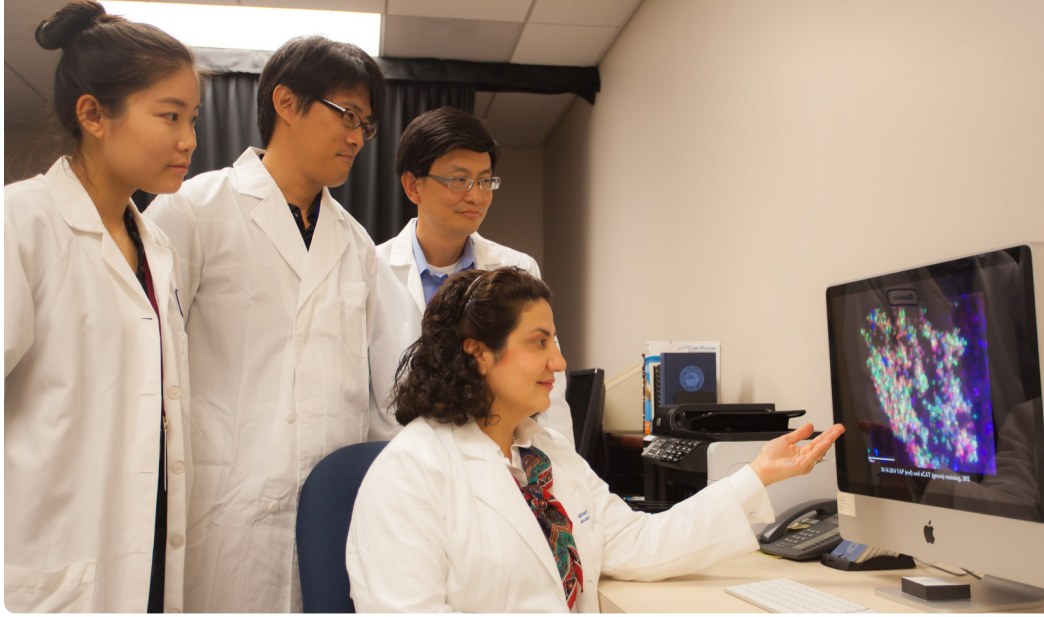
Their most recent NIH research grant is on the study of anterior eye disorders as she investigates CRISPR CAS9 and stem cell regeneration of the cornea. She currently serves on the Data Safety and Monitoring Committee of an extensive NIH clinical trial.

In her clinical practice, Dr. Afshari specializes in corneal transplantation, endothelial keratoplasty, collagen cross linking and intacs for keratoconus, laser refractive surgery, including LASIK, PRK, and treating diseases of the cornea surgically. She is also a highly skilled cataract surgeon and has held national positions on the professional committees of cataract specialists, including serving as the American Society of Cataract and Refractive Surgery's representative on the Council of the American Academy of Ophthalmology. Additionally, she performs a sight-restoring procedure using keratoprosthesis, a synthetic plastic-based artificial cornea which has been featured nationally on television news programs.

In addition to her successes with patients, Dr. Afshari has published extensively in both scientific and medical journals and textbooks. She is the co-editor of a two volume Cornea Book "Principles and Practice of Cornea". While her textbook chapters focus on clinical skills, her peer reviewed journal articles report her innovations and findings in research. Her research has won her multiple honors, including the prestigious Research to Prevent Blindness (RPB) award and the Heed Foundation Ophthalmic Award.

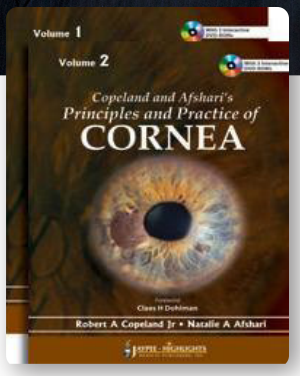
Several scientific and scholarly journals have sought Dr. Afshari's expertise and appointed her to their editorial boards. She currently serves on six editorial boards of prestigious ophthalmic journals: *Investigative Ophthalmology and Visual Science*, *American Journal of Ophthalmology Survey of Ophthalmology*, *Current Opinion in Ophthalmology*, *Ocular Antimicrobials and Anti-infectives* and the *Journal of Ocular Pharmacology and Therapeutics*. She has served on the editorial board of *EyeNet Magazine*, a journal published by the AAO. She has also helped to update two of the books of the American Academy of Ophthalmology, *Cornea books and Lens and Cataract* book.

Dr. Afshari's dedication to research and clinical care inspires her teaching and mentoring of residents and fellows and medical students.





Darlene Shiley, Dr. Afshari and Robert N. Weinreb, MD





Former President of the Corneal Dystrophy Foundation, Robert Bellizi with Dr. Afshari

WHY DID YOU GO INTO MEDICINE?
My interest in medicine began through my desire to help people. I believed that by going into medicine, I had the ultimate opportunity to affect people's lives in a positive way. I see my patients in their most vulnerable times and it has been a gift to me watching them get better throughout their visits. Medicine and ophthalmology were a combination of physics, engineering optics, and making a difference in my community which are all concepts that I am passionate about.

WHAT WAS YOUR LIFE AND CAREER HISTORY BEFORE SHILEY?
After finishing my undergraduate and master's degrees at UC Berkeley, I received my medical degree at Stanford University. After graduating from medical school, I completed my professional training as a resident in Ophthalmology and a fellowship in cornea and refractive surgery at Harvard University Massachusetts Eye and Ear Infirmary. I continued my ophthalmology clinical and research career by joining the faculty at Duke University where I became Full Professor and Director of Centers of Excellence. I was then recruited by Robert N. Weinreb, MD and started at the Shiley Eye Institute in 2012 on Halloween Day.

HOW DO COLLABORATIONS FIT INTO YOUR ROLE AS A RESEARCHER?
Collaborations are key in my research. I believe teamwork is essential in all research worldwide. By taking into account other scientists' ideas, skills, and experiences, any team can make progress in their field. I study the cornea, which is the eye's outermost lens that controls and focuses the entry of light into the eye. When the cornea is damaged, endothelium can decrease in number which causes swelling in the cornea. Once there is swelling, the cornea loses its clarity. In debilitating conditions such as Fuchs' Endothelial Corneal Dystrophy, there is a frequent loss of endothelial cells. My ultimate goal with my collaborations is to understand the genetics of Fuchs' and to regenerate the cornea.

I have collected over two thousand patients' DNA and blood samples with Fuchs' and controls. My laboratory was able to successfully go from using stem cells to corneal endothelial cells for the first time. We now have the potential to regenerate the cornea and use patients' own skin cells to convert to the endothelial cells. This is an exciting advance in ophthalmology. Currently, we transplant corneas to treat corneal disease - if we could do stem cell treatment – it would be moving forward as a field. Collaborators have been invaluable throughout this research. I still collaborate with those I previously worked with and communicate regularly with colleagues at Case Western Reserve University and Duke University. I also have close collaborators here at UC San Diego Sanford Stem Clinical Cell Center as well as Scripps Research Institute here in La Jolla.

Robert N. Weinreb, MD, Dr. Afshari and Stuart I. Brown, MD







(Far Left) Dr. Afshari and her daughter

(Left) Dr. Afshari and her family

WHAT HAS BEEN YOUR MOST SIGNIFICANT HONOR?
In 2014, I was honored to be the inaugural holder of the Stuart I. Brown, MD Chair in Ophthalmology in Memory of Donald P. Shiley. I know what a special privilege it is to carry both of these names. Mr. Shiley was an exceptional innovator and visionary in his engineering abilities as well as his philanthropy. I only hope that I can touch as many hearts as he continues to touch throughout the world. Our former chair, Dr. Brown is a legend in the field of cornea. He made what seemed to be impossible - possible with his groundbreaking cornea treatments as he performed the first pediatric cornea transplant in a child in the 1960's. I hope to carry on with these names in my career to give them the respect that they deserve.

HAVE ANY OF YOUR PATIENTS AFFECTED YOU SIGNIFICANTLY?
So many patients have affected my life personally throughout my years of practicing medicine. In my opinion, patients make clinicians humble. Becoming a doctor is all about forming personal human connections. Patients should be able to put their trust into their doctors because with those formed connections it statistically enhances care. My patients always continue to amaze me with how strong they are.

I am a clinical and scientific advisor for the Corneal Dystrophy Foundation and speak at their patient educational conferences across the US. This is an amazing group of people of all ages that have the disease. They are called "Fuchs' Friends" and function as an international support group for people with all kinds of corneal dystrophy. I am so thrilled that it now has over 3,000 members and helped over 10,000 to learn more about their disease.

My goal, as with those of my colleagues in our department is to deliver unparalleled care to our patients, to understand disease mechanisms and develop novel therapies for our patients, to educate the next generation of leaders in the field, and finally to further the reputation of the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego as a world leader in patient care, education, and innovative translational and basic research. We are well on our way to fulfill this goal.

WHAT DO YOU DO IN YOUR FREE TIME?
When not researching or practicing, I have donated my time and surgical expertise as an international volunteer in West Africa, Central America and Mexico to help patients who might otherwise go untreated.

Locally, I coach science Olympiad anatomy for local elementary and middle schools where my two daughters are in school. It is very special for me to see the spark in the eyes of youngsters when they learn more about science as they will carry the torch forward.



LIONS BIOBANK ACCELERATES SEI RESEARCH

In 2017, the Shiley Eye Institute gratefully accepted a groundbreaking donation to establish the Downtown San Diego Lions Club BioBank for Vision. The BioBank provides a library of biological samples with complete background information that researchers can utilize to learn about predictors for diseases and effectiveness of therapies. The goal of the BioBank is to leverage the latest in bioinformatics technology and genetic sequencing tools to advance the understanding of eye diseases such as glaucoma, macular degeneration and diabetic retinopathy.

Demographic, ethnic, medical and risk factor history data are collected from patients using iPads. The 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. The protocol that has been approved by the UCSD Institutional Review Board Committee involves all activities including the sample collection, sample processing and intended use and handling protocol.

Patients with retinal degenerations, glaucoma and other blinding eye diseases who participate in this research have provided blood samples that are processed into DNA, RNA and other important components of blood. These samples are isolated, quantified and standardized in preparation for future genetic analysis. Moreover, induced pluripotent stem cells from specific individuals also are stored in the BioBank.

In addition, patients that undergo eye surgery have provided aqueous humor samples. The aqueous humor is the clear fluid in the front of the eye between the lens and the cornea. These samples are frozen in liquid nitrogen and transferred to ultra-cold (-80 degrees centigrade) laboratory freezers. They are awaiting proteomic analysis, a systematic identification and quantification of the proteins of a cell, tissue or biological fluid. SEI researchers will then examine how the samples contribute to the regulation of eye pressure and the delivery of nutrients to the eye.

“The BioBank has allowed our research team to make advances in understanding the biology of diseases for the future of personalized medicine,” said **Robert N. Weinreb, MD**, Director of the Shiley Eye Institute and Chair, Viterbi Family Department of Ophthalmology. “The support from the San Diego Lions Welfare Foundation assists us to better diagnose, prevent and treat eye diseases for patients.”

Led by **Linda Zangwill, PhD** and **Radha Ayyagari, PhD**, the Shiley BioBank was launched in 2012. For the past 8 years, these biological samples have been employed to (1) learn about predictors of diseases (biomarkers); (2) determine effectiveness or lack of effectiveness of therapies; (3) understand disease pathologies; and (4) develop successful cures for blinding eye diseases. The Downtown San Diego Lions Club BioBank for Vision is an invaluable resource for SEI investigators that contributes towards the future of finding cures for blinding eye diseases, helping patients globally.

NEW ENDOWED CHAIRHOLDER **NAPOLEONE FERRARA, MD**



Congratulations to **Napoleone Ferrara, MD** on receiving the appointment to the Ben and Wanda Hildyard Chair for Diseases of the Eye. He is Professor of Ophthalmology and Pharmacology as well as Distinguished Professor of Pathology and Senior Deputy Director for basic science at the UC San Diego Moores Cancer Center. This chair will support Dr. Ferrara's research activities in the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego.

Dr. Ferrara is a molecular biologist credited with helping decipher how tumors grow and with development of new treatments for both cancer and age-related macular degeneration. He earned his medical degree at the University of Catania Medical School in Italy and completed his postdoctoral research at University of California, San Francisco. He transitioned to private industry at Genentech, the San Francisco-based biotechnology company, where he served as a long-time research fellow before starting at UC San Diego in 2012.

His main research interests are the biology of angiogenesis and the identification of its regulators. In 1989, while at Genentech, he identified the role of the human VEGF gene in promoting angiogenesis – the formation of new blood vessels that can feed tumor growth – and subsequent development of two major monoclonal antibody drugs: Bevacizumab (marketed as Avastin), which is used to treat multiple forms of cancer, including breast, brain and colorectal, and ranibizumab (marketed as Lucentis), which treats wet age-related macular degeneration, a leading cause of blindness around the world.

Dr. Ferrara was elected to the National Academy of Sciences in 2006, elected to the National Academy of Medicine in 2015 and inducted as a Member of the Retina Hall of Fame in 2020. He has won numerous scientific awards, including the General Motors Cancer Research Award (2006), the ASCO Science of Oncology Award (2007), the Pezcoller Foundation/AACR International Award (2009), the Lasker~DeBakey Clinical Medical Research Award (2010), the Dr. Paul Janssen Award for Biomedical Research (2011), The Economist's Innovation Award for Bioscience (2012), the Breakthrough Prize in Life Sciences (2013), the A. Champalimaud Vision Award (2014), the Gairdner Foundation International Award (2014), the Leslie Dana Gold Medal (2015), and the G.B. Bietti Gold Medal (2019).

We are so proud to have him on our team!

KNIGHTS TEMPLAR EYE FOUNDATION GRANT AWARDED TO SEI PHYSICIAN SCIENTIST

Shyamanga Borooah, MBBS, PhD, newly appointed to the faculty of the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego, Assistant Professor of Ophthalmology at UC San Diego, has received a prestigious grant from the Knights Templar Eye Foundation. The 2020 Pediatric Ophthalmology Research Grant will support the development of new treatments for sight threatening childhood eye disease.

The grant will support Dr. Borooah's work on retinal degeneration associated Danon disease, a complex systemic disorder, caused by a faulty gene. It is a condition that is characterized by weakening of the heart muscle and skeletal muscles used for movement. Children with Danon disease often develop a severe retinal degeneration which causes vision loss.

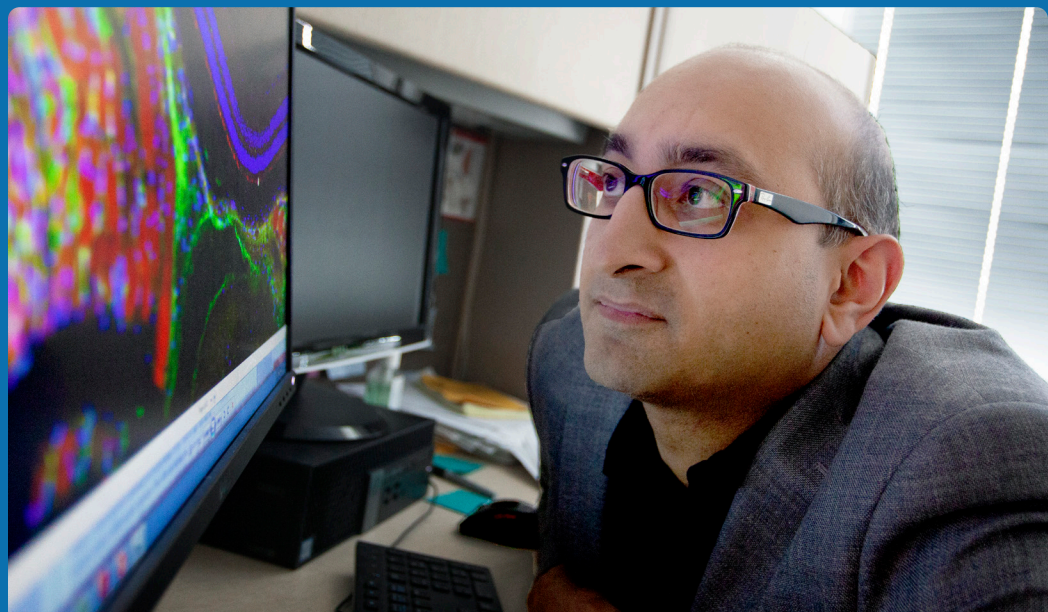
Dr. Borooah states, "I am hugely honored to have been awarded a Pediatric Ophthalmology Research Grant by the Knights Templar Eye Foundation. This funding is vital to support the stem cell and gene therapy research programs at the Shiley Eye Institute."

This critical research will be performed in close collaboration with Eric Adler, MD, Professor of Medicine and Director of the Cardiac Transplant and Mechanical Circulatory Support at UC San Diego Health. He has many years of experience caring for children with Danon disease.

Dr. Borooah continues, "As part of an academic medical center, the Shiley Eye Institute regularly deals with the most complex retinal diseases in pediatric and adult cases. The research, in my laboratory, aims to develop new treatments for this and other inherited retinal degenerations. The ultimate aim of these investigations is to develop new treatments to prevent blindness in children."

Dr. Borooah completed his medical training at the Imperial College in London, his ophthalmology residency at the University of Edinburgh in Scotland and retina fellowship at Moorfields Eye Hospital in London. He also obtained a PhD in stem cells during which he developed gene editing and a model of retinal degeneration using retinal cells. His research accomplishments have been honored with multiple prestigious awards including a Rowling scholarship for translational medicine, a Foundation Fighting Blindness Career Development Award and a Fulbright Fight for Sight Scholarship.

The mission of the Knights Templar Eye Foundation is to improve vision through research, education, and supporting access to care. Their grants help to launch the careers of clinical or basic researchers committed to the prevention and cure of potentially blinding diseases in infants and children.





SCOOTER ACCIDENTS CAN CAUSE SEVERE EYE INJURIES

Over the past several years, our Division of Ophthalmic Plastic and Reconstructive Surgical team led by **Don O. Kikkawa, MD**, has seen an uptick in the number of patients brought into emergency rooms for accidents from scooter collisions.

These electric standing scooters (e-scooters) have been popular in cities and on college campuses worldwide for being convenient but they can go very fast, leading to crashes. According to the California DMV, the maximum speed limit scooters may be driven is 15 mph, but they can go much faster. The ensuing injuries are often sight threatening and bad enough that surgery is required.

Physician scientists, working with Dr. Kikkawa, reviewed data on 34 patients with facial injuries, all resulting from e-scooter accidents, from UC San Diego Health emergency departments in La Jolla and Hillcrest over a year's time. Reporting in the publication *Ophthalmology*, the team found that 90% had one or more facial fractures around the eye; 12% had injuries to both eyes; 24% needed surgery and three-quarters required hospitalization.

Some of the injuries included: eyelid lacerations, retinal hemorrhage and high intra-ocular pressure. Demographically, 74% were male with a mean age of 36.7 years.

Dr. Kikkawa stated, "This study demonstrates the need for more research on the public health safety impact of e-scooters and wearing helmets. We were able to treat these patients' injuries immediately and will follow them closely for future repercussions to vision."

An important item to note: none of the patients had been wearing helmets and 74% of the riders were under the influence of alcohol or drugs. According to the California DMV, it is not a law to wear a helmet when riding an electric scooter but is preferred for safety purposes.

Other SEI authors on the study include: Adeleh Yarmohammadi, MD, **Sally L. Baxter, MD, MSc**, Lilangi S. Ediriwickrema, MD, MS, **Catherine Y. Liu, MD, PhD** and **Bobby S. Korn, MD, PhD**.



Shiley Eye PGY-4 resident Adeleh Yarmohammadi, MD on an electric scooter

WELCOME NEW FACULTY

SALLY L. BAXTER, MD, MSC



The Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego welcomes **Sally L. Baxter, MD, MSc**, as an Assistant Professor of Ophthalmology and Biomedical Informatics. She is a physician and informaticist integrating comprehensive ophthalmic care with research investigation in big data, artificial intelligence and health information technology systems.

Dr. Baxter was an Angier B. Duke Scholar at Duke University, where she graduated summa cum laude with degrees in Biology, Physics and Genome Science & Policy. She was one of 40 American students awarded the prestigious United States Marshall Scholarship, which funded her Master of Science (MSc) in Public Health at the London School of Hygiene & Tropical Medicine (University of London), one of the world's leading institutions for research and education in public and global health.

She then completed her MD at the Perelman School of Medicine at the University of Pennsylvania with a full academic scholarship through the 21st Century Scholars Program. She returned to her hometown of San Diego to complete her internship in internal medicine, residency in ophthalmology, and fellowship training in biomedical informatics, all at UC San Diego.

Dr. Baxter is dedicated to providing the highest level of patient care. She was awarded the Charles A. Oliver Memorial Prize for the highest record of performance in ophthalmology at Penn and the Lamont Ericson, MD Award for outstanding patient care by a resident at UC San Diego. Her surgical skills are informed by decades of experience developing technical physical capabilities as a classically trained pianist and violinist as well as a former NCAA Division I pole vaulter, achieving All-Time Top 5 record performance while at Duke.

Dr. Baxter's research interests involve using data from electronic health records and imaging tests to enhance clinical outcomes using traditional statistical methods as well as machine learning and artificial intelligence. She is innovating ways of incorporating digital health technology into patient care. She is also passionate about education, having served as Chief Resident at the Shiley Eye Institute and being involved in education and training of undergraduate students, graduate students, medical students, residents, and fellows.



One project that she is particularly proud of stemmed from her participation in a graduate course in natural language processing that was part of her informatics fellowship. In this course, she worked alongside an undergraduate student, a master's student, and a PhD student, as well as informatics faculty advisors, to develop models predicting various outcomes in critical care patients with fungal bloodstream infections, including mortality and fungal ocular involvement. Dr. Baxter states, "This was a great experience of working with others from different backgrounds to tackle difficult questions together by linking clinical domain knowledge with predictive modeling and machine learning. We published this work in an international conference as well as a high-impact journal. It was a prodigious demonstration of research productivity arising from people united by a university course."

(Left)
Dr. Baxter working with graduate students (L to R) Gordon Ye, Bharanidharan Radha Saseendrakumar, MS and Adam Klie.

Sally L. Baxter, MD, MSc has been awarded the prestigious ***National Institute of Health (NIH) 2020 Director's Early Independence Award*** for her work in health information technology. This award funds opportunities for outstanding early career scientists for independence and is part of the High-Risk, High-Reward Research program. It supports outstanding junior scientists with the intellect, scientific creativity, drive and maturity to bypass the traditional postdoctoral training period to launch independent research careers.

The major goals of Dr. Baxter's project are to design and develop health information technology interventions to enhance risk stratification of patients with glaucoma. Methods include big-data analytics and predictive modeling using electronic health record (EHR) data from the NIH All of Us Research Program, evaluation of 24-hour blood pressure monitoring using smartwatch devices and measuring glaucoma medication adherence using novel flexible electronic sensors.

The NIH Common Fund established the NIH Director's Early Independence Award to provide a mechanism for exceptional early career scientists to move rapidly into independent research positions at U.S. institutions by essentially omitting the traditional post-doctoral training period.

Congratulations Dr. Baxter!



SEI IN THE COMMUNITY

Photo by: Ken Bohn, San Diego Zoo Global

Animal care specialists at the San Diego Zoo Safari Park were concerned when they noticed cloudiness in the left eye of Leslie, a 3-year-old female western lowland gorilla. Closer inspection confirmed that the baby gorilla's lens had developed a cataract and the left eye was shifting haphazardly, prompting Leslie to favor use of her right eye. The animal caregivers suspected that her cataract was a result of an injury, either from a fall while climbing or from an overly rambunctious play session with other young gorillas in her troop.

Given Leslie's young age and developmental stage, Safari Park veterinarians organized a squad of internal and external experts, including a team from the Shiley Eye Institute, led by **Chris W. Heichel, MD** to perform the Park's first-ever cataract surgery on a gorilla. Dr. Heichel, Associate Clinical Professor and cornea specialist, performed the delicate cataract surgery along with his team consisting of Chief Resident, Adeleh Yarmohammadi, MD and surgical technician, Myrian Carrasco.

A cataract is a clouding of the clear lens behind the colored part of the eye, known as the iris. Cataracts typically develop over time, as part of the normal aging process, but they can also be caused by trauma to the eye. Once a cataract develops, the lens becomes progressively cloudier and vision deteriorates.

The young gorilla was given a pharmaceutical muscle blocker which prevented even the slightest movement as she rested comfortably in the operating room at the San Diego Zoo's Global Paul Harter Veterinary Medical Center. Dr. Heichel utilized a specialized microscope and instruments designed for human cataract surgery to successfully remove the cataract in Leslie's left eye using gentle suction. Once the cloudy lens was removed, a new artificial lens was inserted to provide Leslie with clear vision for the rest of her life.

Because of Leslie's age, the Safari Park's animal care team was concerned her 31-year-old mother, Kokamo, might be upset about Leslie's absence from the gorilla habitat during the procedure. They decided to anesthetize Leslie and Kokamo at the same time, and use the opportunity to perform a routine health check on Kokamo.

Dr. Heichel has performed thousands of eye surgeries on human patients, ranging in age from one day to 105 years, but this was his first surgery on a gorilla. "Fortunately, the similarities between the anatomy of human and gorilla eyes are great enough to allow us to safely navigate the procedure without complication," said Dr. Heichel. "The remainder of the eye appeared to be in excellent health, indicating exceptional vision potential for the rest of Leslie's life."

After surgery, Leslie was given both topical and oral antibiotics as well as steroids to prevent infection and to control postoperative inflammation. She was monitored closely and soon back with her troop in the Gorilla Forest habitat at the Safari Park. Following successful healing, the remaining concern was the possibility of cloudiness recurring.

"The eye has an envelope that holds the lens in place. It should remain clear, but sometimes after cataract surgery, the envelope will get a little cloudy," stated Dr. Heichel. "In a human patient, we can laser the envelope to remove the cloudiness. That might not be quite so easy for Leslie, therefore I made a little opening in the back of the envelope to maintain her clear vision in the future. I am grateful for the chance I had to work with the exceptional San Diego Zoo Global team to help have a positive impact on Leslie's life."

Leslie is doing well and now has healthy eyes thanks to the successful surgery by Dr. Chris Heichel and his Shiley team.



Photo by:
Ken Bohn, San Diego Zoo Global



DEEP LEARNING @ SEI

Artificial intelligence is revolutionizing health care, and research conducted by **Linda Zangwill, PhD** (Professor of Ophthalmology and holder of the Richard K. Lansche, MD and Tatiana A. Lansche Endowed Chair) at the Shiley Eye Institute (SEI) is leading the way.

One promising application is for the development of deep learning algorithms to automate the detection of disease from medical images. Acquisition of retinal images by ophthalmologists has been the standard of care for decades. Dr. Zangwill oversees the Hamilton Glaucoma Center Data Coordinating Center and also the Imaging Data Evaluation and Analysis Reading Center that have processed over 250,000 retinal photographs and optical coherence tomography images.

Working with collaborators at SEI (including **Robert N. Weinreb, MD**, James Proudfoot, PhD, **Sasan Moghimi, MD**, Mark Christopher, PhD, **Chris Bowd, PhD**, **Michael Goldbaum MD** and **Hannah Hou, MD, PhD**) as well as the Department of Computer Science and Engineering at UC San Diego (David Kriegman, PhD), Dr. Zangwill is studying whether the information can be used to detect glaucoma and its progression.

The data also is being studied to predict visual function with the objective of improving the accuracy and consistency of glaucoma diagnosis. In the future, Dr. Zangwill hopes clinicians will be able utilize the results of the model predictions to more effectively individualize and reduce the frequency of visual field testing in glaucoma patients. According to Dr. Weinreb, "the ultimate goal of these tools is to provide automated decision support for clinicians and to provide screening tools to detect glaucoma in the community, particularly in underserved areas with limited access to ophthalmic care".



Anne F. Ratner with David B. Granet, MD

THE RATNER TURNS 25!

2020 marks the 25th anniversary of The Anne F. and Abraham Ratner Children's Eye Center serving the children of San Diego and beyond by providing the highest level of pediatric ophthalmology available. Preventing and treating vision loss in children is - and will always be - the highest priority.

Anne Ratner donated the funds for the Ratner Children's Eye Center in 1993 to honor her late husband Abraham. Anne went on to create the Anne F. Ratner Endowed

Chair in Pediatric Ophthalmology to attract an outstanding world class physician to the facility. **David B. Granet, MD**, Professor of Ophthalmology and Pediatrics, has been the Director of the Ratner Eye Center and also holds the Chair. Anne passed in 2011 reaching the amazing age of 100 having seen the expansion of the Center.

Dr. Granet stated, "Anne's determination to make a difference in the world by helping conquer childhood blindness and vision loss will impact youngsters for generations. Her legacy is not just to children in San Diego or the United States, but rather worldwide."

Since opening its doors in 1995, the physicians at the Ratner Eye Center have performed over 150,000 examinations. It was constructed to meet the needs of pediatric patients providing a comfortable atmosphere while being state-of-the-art to ensure more successful eye examinations - a home court advantage!

The team grew in 2003 with the addition of renowned pediatric ophthalmologist, **Shira Robbins, MD**. With so many families trusting the Ratner Eye Center for their children's eyecare, recently two highly-respected physicians were added to round out the team, **Jolene Rudell, MD, PhD**, and **Mansoor Movaghar, MD**. These caring doctors treat young patients from San Diego, the Southwest, the US and the world starting with premature babies to teenagers as well as adults with eye alignment issues. They examine and diagnose all types of eye conditions and diseases from strabismus, retinopathy of prematurity, pediatric cataracts or glaucoma and nystagmus as well as trauma.

Anne and Abraham's daughter, Pauline Foster, continued their philanthropic legacy by supporting pediatric ophthalmology fellowships at the Ratner Eye Center expanding the educational mission of teaching other physicians, as well as the re-construction after a 2012 flood destroyed the facility. The structure needed complete renovations and Pauline generously stepped in to save the building. She sadly has since passed. The Ratner team has trained 120 ophthalmology residents and 24 pediatric ophthalmology US and international post-graduate fellows who now take care of children worldwide. The group's innovative research has been shared in hundreds of publications and even more presentations globally, impacting the care of children globally. Dr. Granet co-founded the World Society of Paediatric Ophthalmology & Strabismus, the largest group of its kind.



David B. Granet, MD, Pauline Foster and Shira Robbins, MD

Locally, the Shiley EyeMobile for Children has been referring young patients in the San Diego community to the Ratner Eye Center for serious eye issues for 20 years, screening over 200,000 youngsters at no cost to their families. Mrs. Ratner was one of the EyeMobile's founding supporters.

Each child who comes to the center is given the most comprehensive eye and vision care possible by pediatric ophthalmologists, a certified orthoptist, and international and US clinical and research fellows. Through teaching, research and providing heartfelt world class healthcare to children - the Ratner Children's Eye Center has made a difference in hundreds of thousand lives across the planet.

We are so grateful for the Ratner and Foster family support over these many years! If you are interested in helping us make a difference for children, please consider supporting the Anne F. and Abraham Ratner Children's Eye Center. To do so, please contact Karen @ 858-534-8017.

FROM A GRATEFUL FAMILY

*"We were first introduced to **Shira Robbins, MD** while our son, Drake, was in the NICU at UC San Diego Medical Center in Hillcrest. At six months old, he was diagnosed with amblyopia and esotropia. Little did we know at the time what an integral and crucial role Dr. Robbins would have in our son's life"* explained Nicole Howard, Drake's mother.

Amblyopia and esotropia is otherwise known as lazy eye which is a reduction of vision in one or both eyes caused by a neuro-developmental condition that begins in early childhood. It develops when one eye is unable to achieve normal visual acuity – causing blindness in the eye. The condition often presents with poor depth perception and reading difficulties.

She continued, *"Throughout Drake's vision journey, we experienced progression, regression, surgeries and the unknown. Through it all, Dr. Robbins was there to provide expert professional advice and guide us overwhelmed parents in the right direction. Her caring and compassionate manner always made us feel like more than just another patient. After nearly fourteen years of countless pairs of glasses, hours of eye patching and two surgeries, Drake just had his best eye exam yet! Her expertise has given him the gift of vision that he may not have had otherwise. Words cannot adequately express our admiration and gratitude for all that Dr. Robbins has done for Drake and for our family. Thank you, Dr. Robbins. We are eternally grateful."*

- The Howard Family

The goals of the physicians at the Anne F. and Abraham Ratner Children's Eye Center are to: detect, properly diagnose and treat childhood eye disorders and diseases; disseminate information to parents of warning signs and the importance of early intervention; create a child friendly environment and ensure that exams are comfortable and pleasant for both children and parents; and to reach out to the San Diego community and create awareness of childhood vision illnesses.







A PATIENT'S VIEW



*"HERO is a designation **David B. Granet, MD** at the Ratner Children's Eye Center deserves! Imagine getting ready for a New Year's Eve 2000 celebration; peering into your mirror and noticing that your right eye is suddenly going in the wrong direction. That was the beginning of my saga.*

*I first consulted my local ophthalmologist, who thinking that I might have a brain tumor, referred me for an MRI. I subsequently saw a local neuro-ophthalmologist who yelled at me because I "wouldn't" (could not) hold my eye in position for the visual field test. Shortly after, the original doctor admitted he did not know what was wrong and referred me to the Shiley Eye Center. I first saw oculoplastic specialist, **Don O. Kikkawa, MD** who brought in Dr. Granet. At that time, standard protocol for treatment was to watch for the eye muscles to cease changing and then monitor for another 6 months for stability before Dr. Granet would be able to perform a "strabismus type" surgery. In the meantime, I had severe vertical double vision. I struggled with everyday activities and could not drive.*

Dr. Granet was intrigued by my case and began researching the anomaly. Together, we decided that trying this experimental procedure of injecting botox into the eye muscle was worth a try. Dr. Granet cautioned me about the possible risks and that it might not work. He projected that it would be up to a week before we would know the effect.

After the injection, I was delighted and called him the next day with good news of improvement with the double vision. There were several more injections and eventually surgery. We both believed, that had this procedure been available when I was first diagnosed, the surgeries would have been minimized or perhaps not necessary. Dr. Granet restored my normal sight. Because of his tenacity, my ordeal had a quicker and better outcome. He truly pioneered the use of Botox (botulism) for adjusting the eye muscles when tethered.

Because of Dr. Granet's work in the field of strabismus, Graves Disease and auto immune abnormalities, thousands of eye patients are now successfully treated with the Botox injections. Dr. Granet continues to improve the lives of his patients because of his compassion, intellectual curiosity and willingness to explore alternative solutions. He is truly a gift to his patients and the world of ophthalmology."

Susan A. McAndrews

ALUMNI ACROSS THE GLOBE

*"I was an International Pediatric Ophthalmology Fellow at the Ratner Children's Eye Center from 2014-2016 training under **David B. Granet, MD** and **Shira Robbins, MD.** Of all my training experiences as a doctor, this period was by far - the most significant. It made me not only the physician I am today but also the person I am today. Truly, an unforgettable experience. To all residents who think about a Pediatric Ophthalmology Fellowship, let me give you a clinical pearl - do a fellowship at Ratner! Since Pediatric Ophthalmology is an art - better learn from the masters themselves!"*

Michael Kinori, MD
Tel Aviv, Israel



JOHN "RIGBY" SLIGHT, MD



RETIRING AFTER 50 YEARS @ UC SAN DIEGO

Congratulations to **J. Rigby Slight, MD** on his retirement from the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego after 50 years of outstanding service. Dr. Slight, Associate Clinical Professor specializing in glaucoma, started at UC San Diego Ophthalmology in 1970. Over these 50 years, he was affiliated with not only UC San Diego but also Scripps and the Veterans Administration Hospital San Diego, as well as working in private practice.

He has been a vital part of the Hamilton Glaucoma Center research team assisting with clinical trials and co-authoring publications. **Robert N. Weinreb, MD** stated, "For half a century, Dr. Slight has brought outstanding care to our patients, thoughtful mentorship to our training physicians and scientific excellence to our department. He will be sorely missed by the faculty and staff who have had the great honor and privilege of working alongside him over these many years."

WHY DID YOU GO INTO MEDICINE?
I went to a small college (Westminster College, Fulton, Missouri - the Oldest College west of the Mississippi in continuous existence) on a scholarship to be an engineer. The school was strong in pre-med. I started comparing my future in engineering versus medicine and then switched to pre-med after my sophomore year.

WHAT WAS YOUR CAREER PROGRESSION AT UC SAN DIEGO?
I became a Clinical Instructor in Ophthalmology at UCSD in January 1970. I was promoted to an Assistant Professor of Ophthalmology in 1972 and was the Acting Chief of the Section of Ophthalmology at the brand new Veterans Administration Medical Center in La Jolla when it opened in 1972. In 1979,

I was promoted to an Associate Professor of Ophthalmology and from 1980 – 1984 I served as head of the Glaucoma Clinic at UCSD Medical Center Hillcrest. In 1984, Dr. Robert Weinreb joined the staff at UCSD and I have had the pleasure of working for him in various roles since that time.

WHAT CAME BEFORE UC SAN DIEGO?
I was born in Bartlesville, Oklahoma and was a good student in school. After graduating from the University of Oklahoma, College of Medicine in 1961 with my MD, I wanted to get away from the cold so went to UCLA for an internship from 1961-1962. Just as I was about to be drafted into the Army, I joined the Air Force. I actually did one month of a cardiology residency at UCLA while waiting to go into the military. I became a Flight Surgeon in the Air Force and became interested in vision - thus I decided to do a residency in Ophthalmology.

In late 1964, I was accepted into the Ophthalmology Residency Program at the University of Southern California (USC)/Los Angeles County and completed a specialty in glaucoma. I feel fortunate that I was accepted into the residency at USC. I now have gone to the University of Oklahoma, UCLA and USC, so I have a good selection of teams in rooting for football and basketball games! When I completed my residency in 1969, I was lucky to be offered a new private practice office in Solana Beach at the Lomas Santa Fe Medical Center and moved to San Diego. The best part - I met and married my wife Lynn in 1971.

HOW HAS OPHTHALMOLOGY CHANGED OVER THESE 50 YEARS OF PRACTICING MEDICINE?
I feel that the biggest change has been in cataract surgery. When I started, it was done to restore sight. Now it is being done to improve sight, sometimes better than at any time before in patients' lives. I believe that glaucoma management is on the verge of monumental advances and they will be so welcome by the millions afflicted across the globe.

WHAT DO YOU DO IN YOU FREE TIME?
My wife Lynn of 49 years recently passed away so therefore most of my free time is spent with my two lovely Golden Retrievers – Kissimmee and Sunshine. Whomever said that dogs are "Man's Best Friend" was 100% correct!







the Ophthalmologist™

POWER LIST 2020

The 100 Most Influential People in the World of Ophthalmology

CONGRATULATIONS!



Robert N. Weinreb MD



Alex Huang, MD, PhD
UC San Diego Glaucoma 2013
Los Angeles



Ningli Wang, MD
UC San Diego Glaucoma 2000
Beijing

"*The Ophthalmologist*" international magazine has once again recognized **Robert N. Weinreb, MD** in "The Power List 2020". Also listed are two of Dr. Weinreb's former glaucoma fellows. This biannual list celebrates the achievements of the most influential figures, thought leaders and opinion makers in the world of Ophthalmology. This list of 100 individuals from throughout the world is selected from more than 100,000 clinicians, scientists and industry executives.

AAO AWARDS TO SEI FACULTY

The American Academy of Ophthalmology (AAO) is the world's largest association of eye physicians and surgeons. Each year the AAO recognizes its members for several different types of achievements. These awards honor ophthalmologists in multiple stages of practice and for a range of activities, from humanitarian service and significant contributions to the profession, to mentorship and faithful volunteer service.

The Academy of Ophthalmology is a global community of 32,000 medical doctors that protect sight and empower lives by setting the standards for ophthalmic education and advocating for our patients and the public. The AAO innovates to advance the profession and ensure the delivery of the highest-quality eye care.

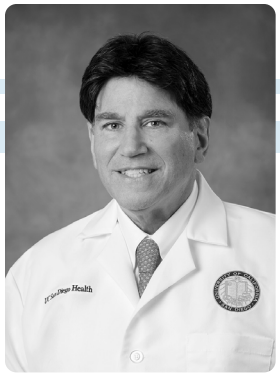
Secretariat Award 2020 - Natalie A. Afshari, MD
Secretariat Award 2019 – Bobby S. Korn, MD, PhD
The Secretariat Award is an annual award recognizing special contributions to the Academy and ophthalmology, as determined by Academy Senior Secretaries and Secretaries in their respective areas. It was created to increase opportunities for ophthalmologists to be recognized for contributions outside of the scope of the current Achievement Awards Program. Although the awards are given annually, they can be recognized for several years of service.

Life Achievement Honor Award 2019 - Don O. Kikkawa, MD
Senior Achievement Award 2019 – Bobby S. Korn, MD, PhD
The Achievement Award program recognizes individuals for their contributions to the Academy based on a cumulative point system. Points are earned through participation in the annual meeting (e.g., as a course instructor or scientific poster, paper or video presenter); by supporting advocacy efforts; or by serving the Academy as a counselor, representative, committee member, author, co-author or reviewer.

2020 ACCOLADES

Every year, Shiley Eye Institute specialists have been honored as being "the best" by every major national and local organization.

The Ophthalmologist
Expertscape
Castle Connolly
San Diego Magazine
TOP Doctors
U.S. News & World Report
Best Doctors
SuperDoctors



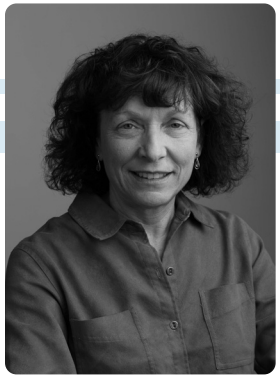
Robert N. Weinreb, MD

Chair & Distinguished Professor, Viterbi Family Department of Ophthalmology
Director, Shiley Eye Institute
Director, Hamilton Glaucoma Center
Distinguished Professor of Bioengineering
Morris Gleich, MD Chair in Glaucoma

Medical School
Harvard Medical School

Residency & Fellowship
University of California, San Francisco

Special Interests
Glaucoma surgery and minimally invasive glaucoma surgery; Optic neuropathy and aging of the eye; Glaucoma genetics; Imaging of the optic nerve; Optical Coherence Angiography; Mechanisms of optic nerve damage in glaucoma; Neuroprotection; Measurement of intraocular pressure; Drug delivery; Cataract surgery; Mentoring the next generation of world leaders in glaucoma



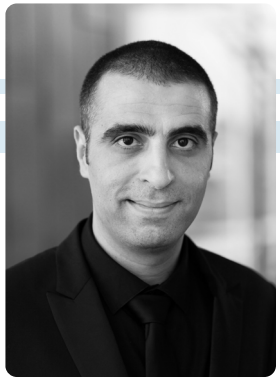
Linda M. Zangwill, PhD

Professor of Ophthalmology
Co-Director of Clinical Research, Hamilton Glaucoma Center
Director, Hamilton Glaucoma Center, Data Coordinating Center,
Richard K. Lansche, MD & Tatiana A. Lansche Chair in Ophthalmology

Graduate School
Harvard School of Public Health (MS)
Ben-Gurion University of the Negev (PhD)

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



Akram Belghith, PhD

Assistant Project Scientist of Ophthalmology

Graduate School
University of Strasbourg, France

Fellowship
University of California, San Diego

Special Interests
Change detection and monitoring of glaucoma; Image processing and machine learning classifier analyses



Christopher Bowd, PhD

Research Scientist of Ophthalmology
Director of the Hamilton Glaucoma Center-based Visual Field Assessment Center
Co-Director of the Hamilton Glaucoma 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



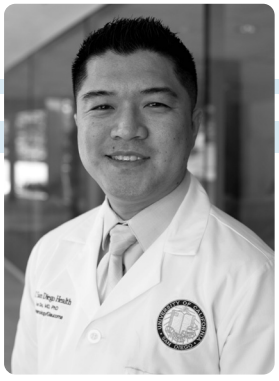
Andrew S. Camp, MD

Assistant Professor of Ophthalmology

Medical School
University of Miami Miller School of Medicine

Residency & Fellowship
Bascom Palmer Eye Institute at the University of Miami Miller School of Medicine
University of California, San Diego Shiley Eye Institute

Special Interests
Development of novel intraocular pressure measurement devices, personalized glaucoma treatment regimens, national and international eye health in underserved populations, and anterior and posterior glaucoma imaging techniques



Jiun Do, MD, PhD

Assistant Professor of Ophthalmology

Medical School
University of California San Diego, School of Medicine (MD)
University of California San Diego, Neurosciences (PhD)

Residency & Fellowship
University of Southern California, Roski Eye Institute
University of California San Diego, Shiley Eye Institute

Special Interests
Translational research; Retinal and optic nerve regeneration; Retinal ganglion cell replacement for glaucoma and other optic neuropathies; Optic nerve relays; Patient measured intraocular pressures and glaucoma progression



Huiyuan "Hannah" Hou, MD, PhD

Assistant Project Scientist

Medical School
Fourth Military Medical University, China

Graduate School
Fourth Military Medical University, China

Fellowship
University of California, San Diego

Special Interests
Ocular neovascularization; Intraocular sustained drug delivery system; Early diagnosis and management of glaucoma; Visual rehabilitation



Won-Kyu "Daniel" Ju, PhD

Associate Professor of Ophthalmology

Graduate School
The Catholic University in Korea (Masters & PhD)

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 retinal ganglion cells and optic nerve head astrocyte neuroprotection in glaucoma



John H.K. Liu, PhD

Professor of Ophthalmology
Director, Glaucoma Sleep Laboratory

Graduate School
National Tsing Hua University (MS Molecular Biology)
Texas A&M University (PhD 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



Sasan Moghimi, MD

Associate Professor of Ophthalmology

Medical School
Tehran University of Medical Sciences

Fellowship
University of California Los Angeles, Stein Eye Institute
University of California San Francisco, Koret Vision Center

Special interests
Imaging in early detection and monitoring of the disease, Angle closure glaucoma diagnosis and treatment



Cristiana Vasile, MD

Associate Physician of Ophthalmology

Medical School
Bucharest University of Medicine, Romania

Residency & Fellowship
University of California, San Diego

Special Interests
Clinical research in glaucoma; Optic Nerve Evaluation



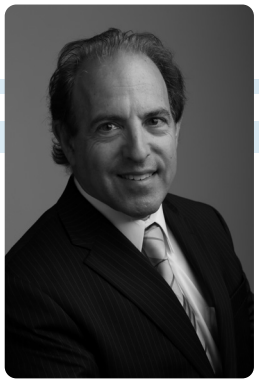
Derek S. Welsbie, MD, PhD

Associate Professor of Ophthalmology

Medical School
University of California, Los Angeles

Residency & Fellowship
The Johns Hopkins University School of Medicine / Wilmer Eye Institute

Special Interests
Neuroprotection in glaucoma and other optic neuropathies; Use of functional genomic technologies to identify novel mediators of axon injury signaling in neurons; Development of dual leucine zipper kinase inhibitors; Role of dual leucine zipper kinase in traumatic brain injury



William R. Freeman, MD

Distinguished Professor of Ophthalmology
Vice-Chair, Department of Ophthalmology
Director, Jacobs Retina Center
Co-Director, Retina Division

Medical School
Mount Sinai School of Medicine, New York, NY

Residency
Lenox Hill Hospital, New York, NY

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

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



Michael H. Goldbaum, MD, MS

Professor of Ophthalmology in Residence
Co-Director, Retina Division

Medical School
Tulane University School of Medicine (MD)
Stanford University (MS)

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

Fellowship
Cornell University Medical Center and New York Hospital

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



Dirk-Uwe Bartsch, PhD

Associate Professor of Ophthalmology

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 Pole



Daniel L. Chao, MD, PhD

Assistant Professor of Ophthalmology

Medical School
Stanford University (MD)
Stanford University (PhD)

Residency
Bascom Palmer Eye Institute, University of Miami

Fellowship
University of California, San Francisco

Special Interests
Surgical and medical management of retinal diseases, diabetic retinopathy, age related macular degeneration; Translational research; Scientific focus on developing zebrafish as a model for retinal diseases; Technology development for new treatments and diagnostics for retinal disease



Shyamanga Borooah, MBBS, MRCP (UK), MRCSEd, FRCOphth, PhD

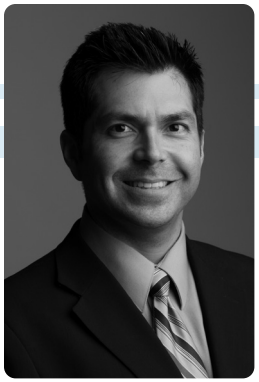
Assistant Professor of Ophthalmology

Medical School
Imperial College London

Residency
University of Edinburgh
South East Scotland

Fellowship
Moorfields Eye Hospital London

Special interests
Adult and Childhood inherited retinal degenerations, age-related macular degeneration, retinal vein occlusion, central serous retinopathy and diabetic eye disease



Henry A. Ferreyra, MD

Professor of Ophthalmology

Medical School
University of California, San Diego

Residency
University of California, San Diego

Fellowship
University of California, San Diego

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



Eric Nudleman, MD, PhD

Associate Professor of Ophthalmology

Medical School
Albert Einstein College of Medicine (MD)
Stanford University (PhD)

Residency
Washington University in St. Louis

Fellowship
Associated Retinal Consultants / William Beaumont Hospital

Special Interests
Adult and pediatric vitreoretinal diseases, including macular degeneration, diabetic eye disease, retinal vein occlusions, retinal detachments, proliferative vitreoretinopathy, macular holes and epiretinal membranes; Specialty interest in pediatric vitreoretinal diseases, including the surgical management of advanced retinopathy of prematurity, familial exudative vitreoretinopathy, Coats disease, persistent fetal vascular syndrome, and intraocular trauma; Scientific focus on developmental angiogenesis, with emphasis on the role of the Wnt Signaling pathway in developmental vascular diseases



Lingyun Cheng, MD

Adjunct Professor of Ophthalmology

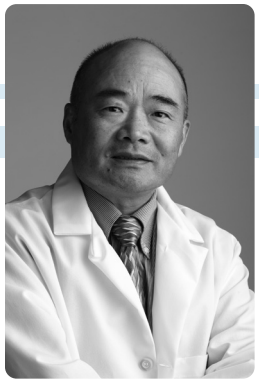
Medical School
Shanxi Medical University, China

Residency
The First Teaching Hospital of Shanxi Medical University, China

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

Special Interests
Ocular drug delivery and vitreoretinal diseases

RETINA & VITREOUS



Peter Shaw, PhD

Associate Professor of Ophthalmology

Graduate School
McMaster University, Ontario, Canada

Postdoctoral Fellowship
University of California, San Francisco

Special Interests
Evaluation and diagnosis of eye diseases including macular degeneration, diabetic retinopathy, glaucoma and inherited retinal degenerations by genetic variants and plasma biomarkers; Investigation of how genetic and oxidative stress risk factors impact on disease pathology; Development of molecular and gene therapy methods to treat eye diseases

OPHTHALMIC PLASTIC & RECONSTRUCTIVE SURGERY



Don O. Kikkawa, MD, FACS

Professor of Ophthalmology and Plastic Surgery
Vice-Chair for Clinical Services, Department of Ophthalmology
Chief, Division of Oculofacial Plastic and Reconstructive Surgery
Dr. Trude Kahn Hollander Chair in Ophthalmology

Medical School
St. Louis University School of Medicine

Residency
University of California, Los Angeles

Fellowship
University of Wisconsin, Madison

Special Interests
Oculofacial surgery; Eyelid, lacrimal and orbital surgery; Thyroid eye disease (orbital decompression and eyelid surgery); Craniofacial disorders involving the eyelids and orbits; Orbital and eyelid tumors; Facial aesthetics - soft tissue fillers and injectables



Bobby S. Korn, MD, PhD, FACS

Professor of Ophthalmology and Plastic Surgery

Medical School
University of Texas, Southwestern Medical School (MD & PhD)

Residency & Fellowship
University of California, San Diego (Chief Resident)

Special Interests
Cosmetic & reconstructive surgery (eyelid & face); Blepharoplasty (eyelid lift surgery); Ptosis surgery (droopy lid surgery); Asian Blepharoplasty (double eyelid surgery); Congenital birth defects; Endoscopic forehead lifting; Thyroid eye disease management; Eyelid & orbital tumors & cancers; Lacrimal/tear outflow system disorders; Bulging or proptosis of eyes; Reconstruction of eyelids post cancer removal; Reconstruction after trauma / eye injuries; Facial fillers; Skin rejuvenation – chemical peel



Yunxiang "Catherine" Liu, MD, PhD

Assistant Professor of Ophthalmology

Medical School
Albert Einstein College of Medicine (MD)
Albert Einstein College of Medicine (PhD)

Residency & Fellowship
University of California, Irvine
Illinois Eye and Ear Infirmary at the University of Illinois, Chicago

Special Interests
Ptosis surgery; Blepharoplasty; Lacrimal disease and surgery; Eyelid and orbital oncology; Blepharospasm and hemifacial spasm; Orbital fractures; Craniofacial disorders involving the eyelid and orbit; Pediatric oculoplastics; Surgical and non-surgical facial rejuvenation



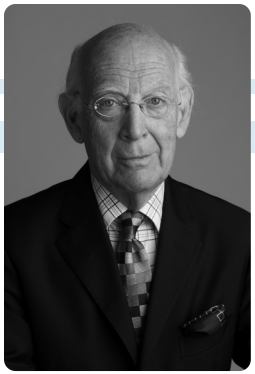
Natalie A. Afshari, MD, FACS

Professor of Ophthalmology
Chief, Division of Cornea and Refractive Surgery
Vice-Chair for Education, Department of Ophthalmology
Stuart I. Brown MD Chair in Ophthalmology in Memory of Donald P. Shiley

Medical School
Stanford University Medical School

Residency & Fellowship
Harvard University, Massachusetts Eye and Ear Infirmary

Special Interests
Corneal surgery; Fuchs Dystrophy; Corneal transplantation; Endothelial keratoplasty (DSAEK & DMEK); Intacs and collagen crosslinking for keratoconus; Laser refractive surgery, including LASIK and PRK, Surgical and medical diseases of cornea; Cataract surgery



Stuart I. Brown, MD

Professor of Ophthalmology

Medical School
University of Illinois Medical School

Residency
Tulane Medical School

Fellowship
Massachusetts Eye and Ear Infirmary, Harvard University

Special Interests
Cornea and external diseases



Weldon W. Haw, MD

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 (Chief Fellow)

Special Interests
Corneal and cataract surgery, Intraocular lenses, Dry Eye/Pterygium, Cornea transplantation, Refractive surgery/ LASIK



Chris W. Heichel, MD, FACS

Clinical Professor of Ophthalmology

Medical School
Chicago Medical School

Residency
University of California, San Diego (Chief Resident)

Fellowship
University of California, San Diego

Special Interests
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



Sally L Baxter, MD, MSc

Assistant Professor

Medical School
Perelman School of Medicine at the University of Pennsylvania

Residency
Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego

Fellowship
University of California San Diego Health Department of Biomedical Informatics

Special Interests
Comprehensive ophthalmology, cataract surgery, diabetic retinopathy screening, caring for underserved populations, digital health



Jeffrey E. Lee, MD

Associate Professor of Ophthalmology
Program Director, Ophthalmology Residency

Medical School
University of California, San Diego

Residency
University of California, San Diego

Special Interests
Facial burns; Orbital trauma; Ocular manifestations of HIV, Optimizing residency cataract surgery education



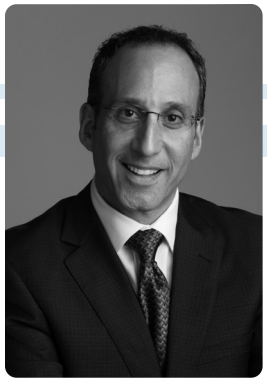
Thao P. Nguyen, MD

Assistant Clinical Professor of Ophthalmology

Medical School
University of Oklahoma, Tulsa

Residency
University of Rochester, New York

Fellowship
University of California, San Diego



David B. Granet, MD, MHCM, FACS, FAAP

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

Medical School
Yale University School of Medicine

Residency
New York University Medical Center (Chief Resident)

Fellowship
Children's Hospital of Philadelphia University of Pennsylvania

Special Interests
Pediatric & Adult Eye Re-Alignment and Strabismus; Nystagmus



Shira L. Robbins, MD, FAAO, FAAP

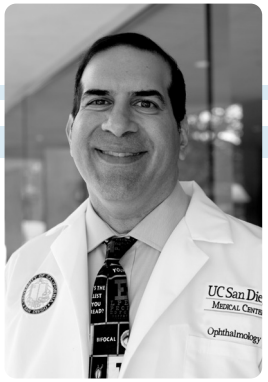
Professor of Ophthalmology
Educational Director of Pediatric Ophthalmology/Strabismus Division

Medical School
Medical College of Pennsylvania Hospital

Residency
Hahnemann University Hospital

Fellowship
University of California San Diego & Naval Medical Center

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



Mansoor Movaghar, MD

Associate Clinical Professor of Ophthalmology

Medical School
University of Medicine and Dentistry of New Jersey - Robert Wood Johnson

Residency
Long Island Jewish Medical Center

Fellowship
University of Wisconsin in Madison

Special Interests
Strabismus /eye misalignment /double vision, adult eye movement problems, amblyopia, pediatric cataracts, nasolacrimal duct disorders, congenital eye syndromes, systemic diseases affecting the eyes



Jolene Rudell, MD, PhD

Assistant Professor of Ophthalmology

Medical School
University of California Davis

Residency
University of California Davis

Fellowship
University of Washington / Seattle Children's Hospital

Special Interests
Strabismus/eye misalignment/double vision, amblyopia, pediatric cataracts, nasolacrimal duct disorders, congenital eye syndromes, systemic diseases affecting the eyes

RETINA & PSYCHOLOGY



Nicholas Oesch, PhD

Adjunct Professor of Ophthalmology
Assistant Research Scientist
Department of Psychology

Graduate School
Oregon Health and Science University (neuroscience)

Postdoctoral Fellowship
National Institutes of Health, Post-Doctoral Research Fellow

Special Interests
Electrophysiology of retinal neural circuits; Visual processing in retina; Synaptic and dendritic neural computation; Optical physiological recording techniques; Retinal degeneration; Retinal prosthetic technologies, Visual psychophysics

REGENERATIVE OPHTHALMOLOGY



Karl Wahlin, PhD

Assistant Professor of Ophthalmology
Director, Richard C. Atkinson Laboratory for Regenerative Ophthalmology

Graduate School
The Johns Hopkins School of Medicine (Neuroscience)

Postdoctoral Fellowship
The Johns Hopkins School of Medicine / Wilmer Eye Institute

Special Interests
Directed differentiation of pluripotent stem cells and their application towards the study of retinal development and eye disease; Photoreceptor cell development and retinal connectivity; Retinal and optic nerve regeneration

GENETICS



Radha Ayyagari, PhD

Professor of Ophthalmology & Pathology
Chief of Ophthalmic Molecular Diagnostic Laboratory (CLIA certified)
Director, Downtown San Diego Lions Club BioBank for Vision

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; Glaucoma



Lanning Kline, MD

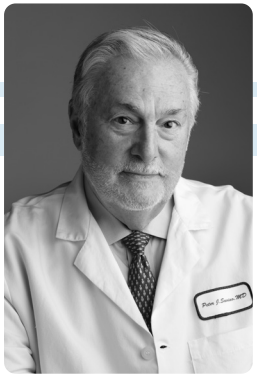
Clinical Professor

Medical School
Duke University

Residency
McGill University, Montreal

Fellowship
McGill University, Montreal University of Miami

Special Interests
Optic nerve disease; Double vision; Pupillary disorders; Demyelinating diseases; Visual abnormalities accompanying stroke



Peter J. Savino, MD

Professor of Ophthalmology & Neurosciences

Medical School
University of Bologna School of Medicine

Residency
Georgetown University Medical Center

Fellowship
University of Miami

Special Interests
Myasthenia gravis optic neuritis, atrophy and neuropathy brain and nervous system tumors visual field defects; Degenerative, metabolic, inflammatory & demyelinating diseases vascular disorders



Todd P. Coleman, PhD

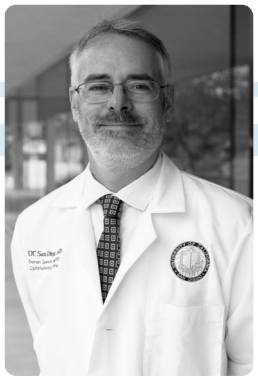
Professor of Bioengineering & Ophthalmology
Co-Director of Center for Perinatal Health, Institute of Engineering in Medicine

Graduate School
Electrical Engineering, MIT (MS/PhD)

Residency & Fellowship
Dept of Brain & Cognitive Sciences, MIT
Dept of Anesthesia, Mass General Hospital

Special Interests
Patient adherence, digital medicine, wireless communications, machine learning

UVEITIS



Doran B. Spencer, MD, PhD

Assistant Clinical Professor of Ophthalmology

Medical School
Oregon Health & Science University

Residency
UC Irvine

Fellowship
Massachusetts Eye Research and Surgery Institution, Harvard Medical School

Special Interests
Specializes in the medical and surgical treatment of uveitis and ocular inflammation

RETINAL VASCULAR



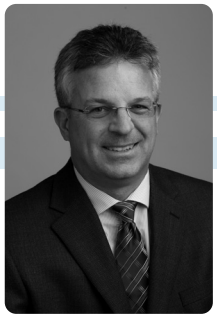
Napoleone Ferrara, MD

Distinguished Professor of Ophthalmology and Pathology
Senior Deputy Director for Basic Sciences, UCSD Moores Cancer Center
Ben and Wanda Hildyard Chair for Diseases of the Eye

Medical School & 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®



JOHN F. KULISCHAK, OD

OPTOMETRY SUPERVISOR

Optometry School
University of California, Berkeley

Residency
Palo Alto VA Medical Center



MARIA LAURA GOMEZ, MD, OD

Foreign Medical School & Residency
Rosario University & Barraquer Institute of America, Bogota, Colombia

Fellowship
Moorfield Eye Hospital, London, UK
UC San Diego Shiley Eye Institute

Specialty
Cornea and Dry Eye



PAMELA A. HOO, OD

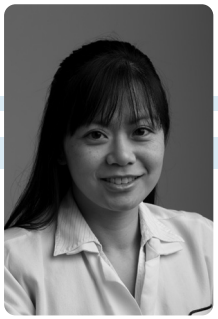
Optometry School
Southern California College of Optometry



LARA D. HUSTANA, OD

Optometry School
Pacific University

Residency
Indian Health Services



ANNE B. LAM, OD

Optometry School
Southern California College of Optometry at Marshall B. Ketchum University

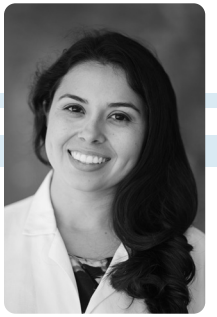


ALICIA LAU, OD

Optometry School
University of California, Berkeley

Residency
Raymond G. Murphy VA Medical Center

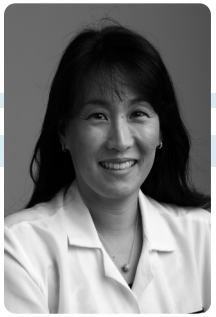
Specialty
Glaucoma and Ocular Disease



ESMERALDA MCCLEAN, OD

Optometry School
University of California, Berkeley

Specialty
Ocular Disease



LIANNE MIZOGUCHI, OD

Optometry School
New England College of Optometry



ANDREW VO, OD

Optometry School
University of California, Berkeley

Residency
Southern California College of Optometry at Marshall B. Ketchum University

Specialty
Specialty Contact Lens



CAROL YU, OD, FAAO

Optometry School
University of California, Berkeley

Residency
Nova Southeastern University

Specialty
Specialty Contact Lens, Ocular Disease



RESIDENTS

THE UC SAN DIEGO OPHTHALMOLOGY RESIDENCY TRAINING IS A THREE-YEAR PROGRAM WITH 12 RESIDENT PHYSICIANS (FOUR PER YEAR OF TRAINING).

Our highly selective residency program receives over 400 applications per year from throughout the country to fill four positions. The program 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 at the Shiley Eye Institute. Under the supervision of the renowned Shiley faculty, residents learn to care for patients, from common to very rare eye conditions.

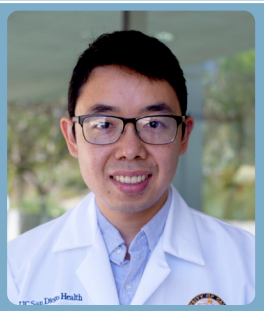
With departmental support, residents also partake in the many cutting-edge research opportunities available in the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego and present their work at national meetings such as the American Academy of Ophthalmology and the 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.

FELLOWS 2019 - 2020

Shiley Eye Institute and the Viterbi Family Department of Ophthalmology at UC San Diego offers world-class fellowships in cornea, glaucoma, ophthalmic plastic and reconstrutive surgery, pediatric ophthalmology, and retina. Fellows are exposed to expert 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.

GLAUCOMA


Tutul Chakravarti, MD


Eric Chan, MD


Mark Christopher, MD

GLAUCOMA


Genea Edwards, PhD


Eren Ekici, MD


Nevin El-Nimri, OD, PhD

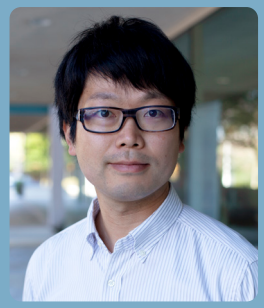


Alireza Kamalipour, MD


Martha Kim, MD, PhD

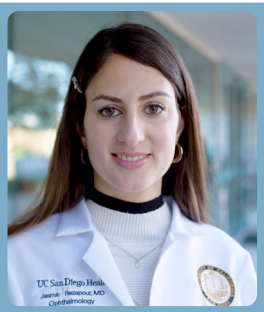

Xiongfei Liu, MD

GLAUCOMA


Takashi Nishida, MD, PhD


Won Hyuk Oh, MS, MD, PhD


Rafaella Cleto Penteado, MD


Jasmin Rezapour, MD


Joo Youn Shin, MD, PhD

RETINA

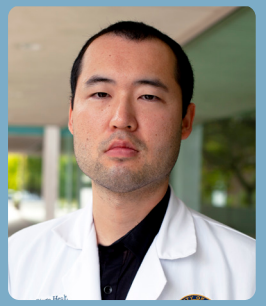

Mathieu Bakhoum, MD


Melina Cavichini Cordeiro, MD


Mahima Jhingan, MD


Darren Knight, MD


Asha Kumari, MD

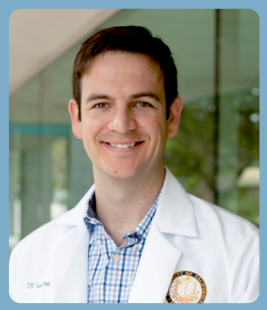

Chris Wu, MD

RETINA


Xiao Ying, MD

OCULOPLASTICS


Zvi Gur, MD


DJ Ozzello, MD

CORNEA


Dean Flanders, MD


Kevin Garff, MD


Paco Male, MD

PEDIATRIC


Kirsta Brummel, DO

Not Pictured:

Jen-Hua Chuang, PhD
Leonardo Lando, MD

ALUMNI

GRADUATION OF RESIDENTS & FELLOWS

On June 22, 2020, the Viterbi Family Department of Ophthalmology graduated outstanding residents and fellows with a virtual online ZOOM ceremony and socially distanced ceremony in the Shiley Conference Room. We are so proud of our graduates!

GRADUATING RESIDENTS

Heather Chen, MD
Clara Men, MD
Christopher Toomey, MD, PhD
James Walsh, MD, PhD (Chief Resident)

GRADUATING CLINICAL FELLOWS

Eric H. Chan, MD, Glaucoma
Xiongfei Liu, MD, Glaucoma
Eren Ekici, MD, Glaucoma Visiting Scholar
Rafaella C. Penteado, MD Glaucoma Visiting Scholar

L. Dean Flanders, MD, Cornea
Kevin Garff, MD, Cornea

Zvi Gur, MD, Oculoplastics & Reconstructive Surgery

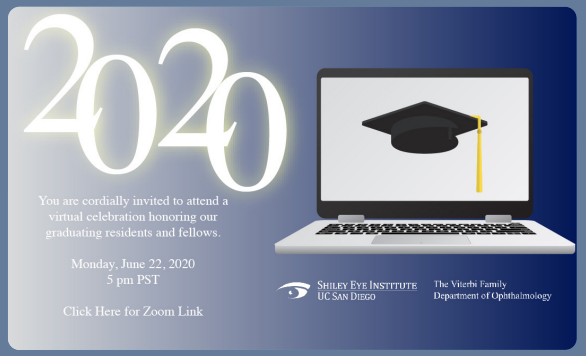
Mathieu Bakhoum MD, Retina
Melina Cavichini-Cordeiro, MD, Retina Visiting Scholar
Mahima Jhingan, MD, Retina Visiting Scholar
Leonardo Lando, MD Retina Visiting Scholar

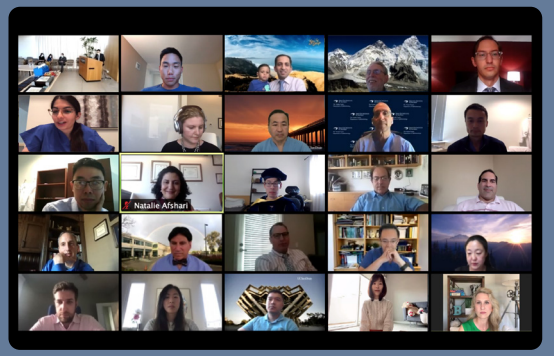
Kirsta Brummel, DO Pediatrics

THE SEVENTH ANNUAL

Lamont Ericson, M.D. Award for Outstanding Patient Care by a Resident

Presented by Residency Director, Jeffrey E. Lee, MD to Heather Chen, MD. Dr. Ericson was an outstanding former resident in the department who passed away in 2007 at a young age. The department is grateful that Dr. Ericson's family has supported his memory in this special way.









AMERICAN ACADEMY OF OPHTHALMOLOGY ALUMNI EVENT

On October 12, 2019, many of our alumni, faculty, senior residents and fellows gathered at China Live in San Francisco for our annual alumni gathering at the Academy of Ophthalmology (AAO) Annual Meeting. Each year the group gathers to reconnect and network with old and new friends from the department.


Kaweh Mansouri, MD, Robert N. Weinreb, MD and Yi Dai, MD, PhD


Jeffrey Lee, MD and Darren Knight, MD


Benjamin Xu, MD, PhD; Alex Huang, MD, PhD, Bobby Korn, MD, PhD and Patrick Yang, MD, PhD


Kouros Nouri-Mahdavi, MD, Christopher Leung, MD and Brian Chang, MD


Payam Amini, MD and Lili Phung, MD


Ivan Maynart Tavares, MD, PhD; Alex Huang, MD, PhD; Linda Zangwill, PhD and Arthur Sit, MD


Abigail Huang, MD and Charlotte Gore, MD


Bradford Lee, MD; Bobby Korn, MD, PhD and Ramzi Alameddine, MD

EDUCATION PHYSICIANS

Monthly, the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego offers the Distinguished Professor Lecture Series with a world-renowned invited visiting professor. Prominent specialists and international leaders update our residents, fellows, optometrists and faculty as well as ophthalmologists and optometrists from around San Diego County. The lectures are followed by a buffet reception, allowing the attendees a chance to network. CME credits (continuing medical education) are available to attendees.

2019 – 2020 VISITING DISTINGUISHED PROFESSORS

October 7, 2019
Natasha Josefowitz, PhD
Distinguished Lecture
DAVID GAMM, MD, PhD
Sandra Lemke Trout Chair in Eye Research
Emmett A. Humble Distinguished Director
Associate Professor of Ophthalmology & Visual Sciences
University of Wisconsin-Madison, McPherson Eye Research Institute
TITLE: "Modeling Best Disease with Human Pluripotent Stem Cells"

November 4, 2019
SCOTT COUSINS, MD
Professor of Ophthalmology
Vice-Chair, Research,
Department of Ophthalmology
Duke Eye Center, Duke University School of Medicine
TITLE: "The Role of Mitochondrial Dysfunction in the Pathogenesis of Dry AMD: From Concept to Clinic for the Mitochondria-directed Drug Elamipretide"

December 2, 2019
JOSHUA STEIN, MD
Edward T. and Ellen Dryer Career Development Professor
Associate Professor, Ophthalmology & Visual Sciences
Kellogg Eye Center, University of Michigan
TITLE: "The Future of Big Data in Ophthalmology"



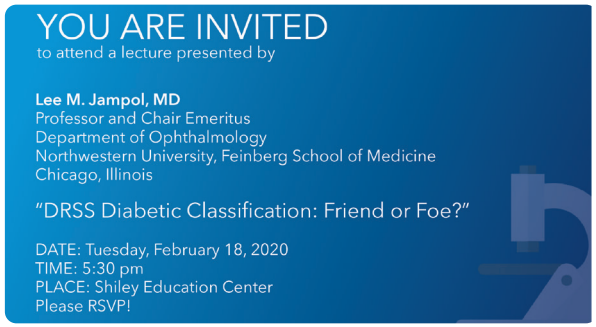




January 6, 2020
ANTHONY KHAWAJA, MD, PhD, MSc
Consultant Ophthalmic Surgeon,
Glaucoma Service
Moorfields Eye Hospital, London, UK
TITLE: "Big Data in Glaucoma –
Can We Translate to Improve Care?"



February 18, 2020
LEE M. JAMPOL, MD
Professor and Chair Emeritus
Department of Ophthalmology
Northwestern University,
Feinberg School of Medicine
TITLE: "DRSS Diabetic Classification:
Friend or Foe?"



February 3, 2020
ALBERT S. JUN, MD, PhD
Walter J. Stark, MD Professor of
Ophthalmology
Chief, Cornea Cataract & External
Eye Diseases Division
Wilmer Eye Institute, Johns Hopkins
Medical Institutions
TITLE: "Fuchs Endothelial Corneal Dystrophy:
A Different View"



February 20, 2020
JANEY WIGGS, MD, PhD
Co-Director, Glaucoma Center of Excellence
Vice Chair, Clinical Research
Associate Director, Ocular Genomics Institute
Harvard Medical School
TITLE: "Using Genetics to Improve Clinical
Care for Glaucoma Patients"



OPHTHALMOLOGY UPDATE



The 2020 Ophthalmology Update, sponsored by the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego, was held February 15-16, 2020 at Cape Rey Carlsbad. The event was a great success with almost 200 attendees. Don O. Kikkawa, MD and Robert N. Weinreb, MD served as Program Chairs. The interdisciplinary faculty of ophthalmic subspecialists reviewed the continuing progress, latest surgical techniques, innovative ideas and cutting-edge translational research in ophthalmology.

The Distinguished Invited Speakers were Reza Vaghefi, MD (UC San Francisco), Kathryn Colby, MD, PhD (NYU Langone Health) and Geoff Tabin, MD (Stanford University).

VISION RESEARCH LECTURES

The Vision Research Lecture Series addresses the latest advances in vision science and clinical ophthalmology. Each presentation features UC San Diego Shiley Eye Institute and the Viterbi Family Department of Ophthalmology's faculty, as well as a selection of leading vision scientists from around the globe. These lectures are held in the Shiley Eye Institute Education Center.

July 11, 2019
CHRISTOPHER DEBOEVER, PhD
Computational Scientist
Biotechnology
TITLE: "Empowering Disease Research Using Population-Scale Genetic Datasets"

July 12, 2019
EMILY CHEW, MD
Director, Division of Epidemiology and Clinical Applications
Medical Officer, National Eye Institute
National Institutes of Health
TITLE: "The Age-Related Eye Diseases Study 2 (AREDS2) and Updates"

August 29, 2019
HAO F. ZHANG, PhD, MS
Professor of Bioengineering
Northwestern University
TITLE: "Visible Light OCT Applications in Ophthalmology"

September 12, 2019
RAJIV R. MOHAN, PhD, FARVO
Professor of Ophthalmology
Mason Eye Institute, University of Missouri School of Medicine
TITLE: "Targeted Gene Therapy Approaches to Corneal Disorders"

September 13, 2019
AARON LEE, MD, MSc
Assistant Professor of Ophthalmology
University of Washington, Seattle
TITLE: "Applications of Deep Learning in Ophthalmology"

September 13, 2019
CECILIA LEE, MD, MS
Assistant Professor & Director, Clinical Trials
University of Washington, Seattle
TITLE: "Using Big Data for Novel Insights in Ophthalmology"

VIRTUAL GRAND ROUNDS

The community and SEI alumni are also invited to the departmental weekly Grand Rounds on Monday afternoon. The Grand Rounds consist of a special lecture from a prominent physician scientist from around the world and case presentations with moderated discussion. Interesting eye diseases, treatment dilemmas and surgical challenges are often the theme. Due to the COVID-19 pandemic, the Grand Rounds became virtual to follow safety guidelines. CME credits are given for this event as well.

April 13, 2020
Moderated by Robert N. Weinreb, MD
GUEST LECTURER:
NINGLI WANG, MD, PhD
Director, Beijing Tongren Eye Center
President, Chinese Association of Ophthalmologists
President, Asia-Pacific Academy of Ophthalmology
TITLE: "Ophthalmic Clinical Practice During COVID-19"

GUEST LECTURER: XUFANG SUN, MD, PhD
Professor, Tongji Hospital, Tongji Medical College
Huazhong University of Science & Technology, Wuhan, China
Chair, Wuhan Ophthalmology Society
Vice Chair, Hubei Ophthalmology Society
TITLE: "COVID-19 – What We Have Learned"

April 20, 2020
Moderated by Don O. Kikkawa, MD and Robert N. Weinreb, MD
GUEST LECTURER:
BRADFORD W. LEE, MD, MS
Assistant Professor of Clinical Ophthalmology
Bascom Palmer Eye Institute
University of Miami School of Medicine
TITLE: "New Horizons: The Evolving Management of Thyroid Eye Disease"

CASE PRESENTATIONS:
Aimee Chang, MD
PGY-2
TITLE: "A Grave Presentation"

DJ Ozzello, MD
Oculoplastics Fellow
TITLE: "Being Active Isn't Everything"

April 27, 2020
Moderated by Natalie A. Afshari, MD and Robert N. Weinreb, MD
GUEST LECTURER: BENNIE JENG, MD
Professor and Chair, Department of Ophthalmology & Visual Sciences
University of Maryland
TITLE: "Management of Neurotrophic Keratopathy"

CASE PRESENTATIONS:
Mark Lin, MD
PGY-2
TITLE: "I Can't Feel My K"

Dean Flanders, MD
Cornea Fellow
TITLE: "A Nerve-Racking Encounter"

May 4, 2020
Moderated by Robert N. Weinreb, MD
GUEST LECTURER:
JEFFREY LIEBMANN, MD
Shirlee and Bernard Brown Professor
Vice Chair, Department of Ophthalmology
Director, Glaucoma Service
Columbia University Medical Center
TITLE: "The Central 10 Degrees"

CASE PRESENTATIONS:
Kaileen Yeh, MD
PGY-3
TITLE: "Mixed Signals"

Eric Chan, MD
Glaucoma Fellow
TITLE: "Feeling Shallow"

May 11, 2020
Hosted by Henry Ferreyra, MD and
Robert N. Weinreb, MD
Moderated by Daniel Chao, MD, PhD
and Shyamanga Borooah, MD, PhD
GUEST LECTURER:
MARK PENNESI, MD, PhD
Associate Professor of Ophthalmology
Kenneth C. Swan Endowed Professor
Division Chief, Ophthalmic Genetics
Casey Eye Institute, Oregon Health &
Science University
TITLE: "Update on Therapies
for Inherited Retinal Diseases"

CASE PRESENTATIONS:
Adeleh Yarmohammadi, MD
PGY-3
TITLE: "My Mother's Eye"

Darren Knight, MD
Retina Fellow
TITLE: "A Sight for Sore Eyes"

May 18, 2020
Hosted by Robert N. Weinreb, MD
Moderated by Doran Spencer, MD, PhD
GUEST LECTURER:
STEVEN L. GONIAS, MD, PhD
Chief of Pathology
Professor and Chair of Pathology
UC San Diego School of Medicine
TITLE: "Update on COVID-19 Testing"

GUEST LECTURER:
JAMES T. ROSENBAUM, MD
Professor of Ophthalmology,
School of Medicine
Professor of Medicine,
Division of Arthritis
and Rheumatic Diseases
School of Medicine, Oregon Health &
Science University
TITLE: "Molecular Diagnosis and the
Challenge of Idiopathic Uveitis"

CASE PRESENTATIONS:
James Walsh, MD, PhD
PGY-4
TITLE: "This Presentation is Brought to
You by the Letters I and P"

Doran Spencer, MD, PhD
TITLE: "Killing Two Birds with One Stone"

June 1, 2020
Hosted by Robert N. Weinreb, MD
Moderated by Peter J. Savino, MD and
Lanning Kline, MD
GUEST LECTURER: JOHN J. CHEN, MD, PhD
Professor of Neuro-Ophthalmology
Department of Ophthalmology,
Mayo Clinic
TITLE: "Update of Optic Neuritis"
CASE PRESENTATIONS;
Adeleh Yarmohammadi, MD
PGY-3
TITLE: "Silently Swollen"

Liane Dallalzadeh, MD
PGY-2
TITLE: "Don't Get on My Nerves!"

June 8, 2020
Hosted by Robert N. Weinreb, MD
Moderated by Eric Nudleman, MD, PhD
GUEST LECTURER:
GEORGE A WILLIAMS, MD
Professor and Chair,
Department of Ophthalmology
Director, Beaumont Eye Institute
Oakland University William Beaumont
School of Medicine
TITLE: "CMS Policy, Retinal Practice
and COVID"

CASE PRESENTATIONS:
Darren Knight, MD, PhD
Retina Fellow
TITLE: "Before the Storm"

Chris Wu, MD
Retina Fellow
TITLE: "After the Storm"

June 15, 2020
Hosted by Robert N. Weinreb, MD
Moderated by Shira L. Robbins, MD and

David B. Granet, MD
GUEST LECTURER: KEN NISCHAL, MD
Professor of Ophthalmology
Vice Chair, Quality
Director, Pediatric Ophthalmology,
Strabismus & Adult Motility
Directory, Pediatric
Program Development
University of Pittsburg
School of Medicine
TITLE: "The Digital Platform Has Landed"

CASE PRESENTATIONS:
David Kuo, MD
PGY-3
TITLE: "6 of One, Half a Dozen of the Other"

Mark Lin, MD
PGY-2
TITLE: "A Show and Tell"

NEW MEDICAL SCHOOL WEBPAGE



The Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego has a new look on the UC San Diego Medical School website. This interactive website is where we feature the education and research portions of our mission.

The website features sections for the training and recruitment of residents, post-doctoral fellows, medical students' elective rotations as well as continuing medical education and information on our weekly grand rounds.

Each ophthalmic computational and research laboratory has representation with detailed information as to what their focus and goals are. The optic disk, visual field and imaging reading centers offer support services for scientific investigation collaborations. Also shown are the Department's active clinical trials, NIH awards and research grants.

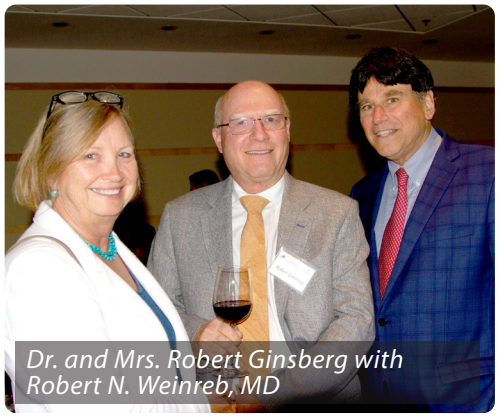
The Viterbi Family Department of Ophthalmology was named after communications pioneer Andrew J. Viterbi, PhD donated $50 million in 2018. Inspired by his father Dr. Achille Viterbi, an ophthalmologist, he is honoring his father's memory by creating a lasting legacy at UC San Diego.

EDUCATION PATIENTS

GLAUCOMA UPDATE

The thirty-sixth annual Glaucoma Update was held on October 30, 2019 at the Goldberg Auditorium in the UC San Diego Moores Cancer Center. **Robert N. Weinreb, MD** presented the latest trends in glaucoma treatments and research from the Shiley Eye Institute, Hamilton Glaucoma Center and around the world. **Derek Welsbie, MD, PhD** and **Jiun Do, MD, PhD** described their innovative stem cell investigations.




Dr. and Mrs. Robert Ginsberg with Robert N. Weinreb, MD




Linda Zangwill, PhD with Jill Herndon


Derek Welsbie, MD, PhD with Richard Atkinson, PhD and Jiun Do, MD, PhD


Bill Ramirez with Patricia and Paul Jovel


Jiun Do, MD, PhD and William Comer, PhD

FIRST ANNUAL NATASHA JOSEFOWITZ, PhD ENDOWED LECTURE



Eric Nudleman, MD, PhD, David Gamm, MD, PhD, Natasha Josefowitz, PhD and Robert N. Weinreb, MD

The first annual Natasha Josefowitz, PhD Distinguished Lecture was held on October 7, 2019 for the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego residents, fellows, faculty, researchers and optometrists as well as ophthalmologists and optometrists from all around San Diego County.

Dr. Josefowitz generously endowed the lecture to bring prominent ophthalmology vision scientists to the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego. The inaugural Josefowitz lecturer was David Gamm, MD, PhD, Professor of Ophthalmology from the McPherson Eye Research Institute at the University of Wisconsin-Madison, who presented "Modeling Best Disease with Human Pluripotent Stem Cells".

"We learn by listening to others' research. It is an exploration of the future of vision care to reduce and cure sight threatening diseases and blindness. The lecture series will feature vision scientists who are on the cusp of new ideas and engaged in transformative research. Even ideas that are outside of our field can trigger thoughts that we wouldn't have considered otherwise," stated Dr. Josefowitz. "Exposure to innovators will create innovations. I am grateful for the opportunity to bring such innovators to Shiley."

Dr. Josefowitz was a professor of management for thirty years and is an internationally known business consultant. She created the nation's first university course for women in business. Her award-winning work has been published in over 20 business and poetry books as well as more than 100 newspapers and magazines. She currently has a weekly column in the La Jolla Village News.

Robert N. Weinreb, MD, noted "Natasha is an amazing supporter and friend of the department. Through her inquisitive nature and encouragement, she challenges us to reach higher and ask the important questions. She inspires all of us. We are honored to have her as part of our team."

PUBLICATIONS

CORNEA

Abbas AA, Lian RR, Afshari NA. Hand Hygiene and Instrument Sanitization in Ophthalmology Clinics. Curr Opin Ophthalmol. 2020 Jan;31(1):28-32.

Afshari NA. April Consultation #7. Journal of Cataract & Refractive Surgery. 2020 Apr;46(4):651.

Arshad JI, Saud A, White DE, Afshari NA, Sayegh RR. Chronic Conjunctivitis from a Retained Contact Lens. Eye Contact Lens. 2020 Jan;46(1):e1-e4.

Barnett BP, Afshari NA. Dupilumab-associated Mucin Deficiency (DAMD). Trans Vis SciTech. 2020 Feb;9(3):29.

Chen TH, Yang PT, Kikkawa DO, Ediriwickrema LS, Afshari NA, Lee JE, Korn BS. A Modified Technique for Bedside Amniotic Membrane Application to the Eyelid Margins for Stevens-Johnson Syndrome. Can J Ophthalmol 2019 Jun;54(3):e118-e120.

Fukuoka H, Sella R, L Haynie M, Afshari NA. Adhesion Strength and Rolling Properties of Descemet Membrane Endothelial Keratoplasty Grafts in a Rabbit Eye Model. Curr Eye Res. 2019 Sep;44(9):929-933.

Gali HE, Afshari NA. Editorial: Surgical Advancements and Innovations in Cataract Surgery for the Complex Patient. Curr Opin Ophthalmol. 2020 Jan;31(1):1-2.

Hu JQ, Sarkar R, Sella R, Murphy JD, Afshari NA. Cost-Effectiveness Analysis of Multifocal Intraocular Lenses Compared to Monofocal Intraocular Lenses in Cataract Surgery. Am J Ophthalmol. 2019 Dec;208:305-312.

Jie Y, Sella R, Feng J, Gomez ML, Afshari NA. Evaluation of Incomplete Blinking as a Measurement of Dry Eye Disease. Ocul Surf. 2019 Jul;17(3):440-446.

Koo EH, Pineda R, Afshari NA, Eghrari A. Learning Descemet Membrane Endothelial Keratoplasty: A Survey of U.S. Corneal Surgeons. Cornea. 2020 May;39(5):590-593.

Lian RR, Afshari NA. The Quest for Homeopathic and Nonsurgical Cataract Treatment. Curr Opin Ophthalmol. 2020 Jan;31(1):61-66.

Lian RR, Siepser SB, Afshari NA. Iris Reconstruction Suturing Techniques. Curr Opin Ophthalmol. 2020 Jan;31(1):43-49.

Pflugfelder SC, Massaro-Giordano M, Perez VL, Hamrah P, Deng SX, Espandar L, Foster CS, Affeldt J, Seedor JA, Afshari NA, Chao W, Allegretti M, Mantelli F, Dana R. Topical Recombinant Human Nerve Growth Factor (Cenegermin) for Neurotrophic Keratopathy: A Multicenter Randomized Vehicle-Controlled Pivotal Trial. Ophthalmology. 2020 Jan;127(1):14-26.

Ruan F, Zang Y, Sella R, Lu H, Li S, Yang K, Jin T, Afshari NA, Pan Z, Jie Y. Intense Pulsed Light Therapy with Optimal Pulse Technology as an Adjunct Therapy for Moderate to Severe Blepharitis-Associated Keratoconjunctivitis. J Ophthalmol. 2019 Sep 16;2019:3143469.

Sella R, Chou L, Schuster AK, Gali HE, Weinreb RN, Afshari NA. Accuracy of IOL Power Calculations in the Very Elderly [published online ahead of print, 2020 Jan 13]. Eye (Lond). 2020 Jan 13;10.1038.

Sella R, Einan-Lifshitz A, Sorkin N, Chan CC, Afshari NA, Rootman DS. Learning curve oftwo common Descemet membrane endothelial keratoplasty graft preparation techniques. Can J Ophthalmol. 2019 Aug;54(4):467-472.

GLAUCOMA

Aghsaei Fard M, Salabati M, Mahmoudzadeh R, Kafieh R, Hojati S, Safizadeh M, Moghimi S, Ritch R, Subramanian PS. Automated Evaluation of Parapapillary Choroidal Microvasculature in Ischemic Optic Neuropathy and Open Angle Glaucoma. Invest Ophthalmol Vis Sci. 2020 Mar 9;61(3):35.

Akbari M, Nikdel M, Moghimi S, Subramanian PS, Fard MA. Effect of Foveal Location on Retinal Nerve Fiber Layer Thickness Profile in Superior Oblique Palsy Eyes. J Glaucoma. 2019 Oct;28(10):916-921.

Asano S, Murata H, Matsuura M, Fujino Y, Miki A, Tanito M, Mizoue S, Mori K, Suzuki K, Yamashita T, Kashiwagi K, Shoji N, Zangwill LM, Asaoka R. Validating the Efficacy of the Binomial Pointwise Linear Regression Method to Detect Glaucoma Progression with Multicentral Database. Br J Ophthalmol. 2020;104(4):569-74. Epub 2019/07/06. doi: 10.1136/bjophthalmol-2019-314136. PubMed PMID: 31272952.

Ayyagari R, Chen YI, Zangwill LM, Holman M, Dirkes K, Hai Y, Arzumanyan Z, Slight R, Hammel N, Girkin CA, Liebmann JM, Feldman R, Dubiner H, Taylor KD, Rotter JI, Guo X, Weinreb RN; ADAGES III Genomics Study Group. Association of Severity of Primary Open-Angle Glaucoma with Serum Vitamin D Levels in Patients of African Descent. Mol Vis. 2019 Aug 9;25:438-445. [PMCID: PMC6707754]

Bogarin T, Saraswathy S, Akiyama G, Xie X, Weinreb RN, Zheng J, Huang AS. Cellular and Cytoskeletal Alterations of Scleral Fibroblasts in Response to Glucocorticoid Steroids. Exp Eye Res. 2019;187:107774.

Bowd C, Belghith A, Goldbaum MH, Christopher MA, Fazio MA, Girkin CA, Liebmann JM, de Morae, CG, Weinreb RN. (In Press). Individualized Glaucoma Change Detection Using Deep Learning Auto Encoder-Based Regions of Interest. American Journal of Ophthalmology.

Bowd C, Belghith A, Goldbaum MH, Weinreb RN, Fazio MA, Girkin CA, Liebmann JM, Zangwill LM. Deep Learning Approaches Predict Glaucomatous Visual Field Damage from OCT Optic Nerve Head En Face Images and Retinal Nerve Fiber Layer Thickness Maps. Ophthalmology. 2020;127:346-356.

Bowd C, Belghith A, Proudfoot JA, Zangwill LM, Christopher M, Goldbaum MH, Hou H, Penteado RC, Moghimi S, Weinreb RN. Gradient Boosting Classifiers Combining Vessel Density and Tissue Thickness Measurements for Classifying Early to Moderate Glaucoma. Am J Ophthalmol. 2020;217:131-139.

Camp AS, Weinreb RN. Hypotony Keratopathy Following Trabeculectomy. Journal of Glaucoma. 2020;29(2):77-80.

Christopher M, Bowd C, Belghith A, Goldbaum MH, Weinreb RN, Fazio MA, Girkin CA, Liebman JM,

Zangwill LM. (2020). Deep Learning Approaches Predict Glaucomatous Visual Field Damage from Optical Coherence Tomography Optic Nerve Head Enface Images and Retinal Nerve Fiber Layer Thickness Maps. Ophthalmology, 127(3), 346-356.

Christopher M, Nakahara K, Bowd C, Proudfoot JA, Belghith A, Goldbaum MH, Rezapour J, Weinreb RN, Fazio MA, Girkin CA, Liebmann JM, De Moraes G, Murata H, Tokumo K, Shibata N, Fujino Y, Matsuura M, Kiuchi Y, Tanito M, Asaoka R, Zangwill LM. Effects of Study Population, Labeling and Training on Glaucoma Detection Using Deep Learning Algorithms. Translational Vision Science & Technology. 2020;9(2). doi: 10.1167/tvst.9.2.27.

De Moraes CG, Paula JS, Blumberg DM, Cioffi GA, Al-Aswad LA, Girkin CA, Weinreb RN, Zangwill LM, Ritch R, Susanna R, Hood DC, Liebmann JM. Detection of Progression with 10-2 Standard Automated Perimetry: Development and Validation of an Event-Based Algorithm. Am J Ophthalmol. 2020;216:37-43.

Do JL, He Y, Qu Y, Zhou Q, Chen Z. (2020). Ultrasound in the Management of Glaucoma. In Advances in Ocular Imaging in Glaucoma. Cham, Switzerland. Springer Nature Switzerland AG.

Do JL, Patel VR. Branch Retinal Vein Occlusion Associated with Fingolimod Treatment for Multiple Sclerosis. Can J Ophthalmol. In Press.

Do JL, Xu By, Wong B, Camp A, Ngai P, Long C, Proudfoot J, Moghimi S, Yang D, Welsbie DS, Weinreb RN. A Randomized Controlled Trial Comparing Subconjunctival Injection to Direct Scleral Application of Mitomycin C in Trabeculectomy. Am J Ophthalmol. 2020 Jul 6:S0002-9394(20)30339-1. [PMID: 32645310]

Edwards G, Perkins GA, Kim KY, Kong Y, Lee Y, Choi SH, Liu Y, Skowronska-Krawczyk D, Weinreb RN, Zangwill L, Strack S, Ju WK. Loss of AKAP1 Triggers Drp1 Dephosphorylation-mediated Mitochondrial Fission and Loss in Retinal Ganglion Cells. Cell Death Dis. 2020;11(4):254. PMCID: PMC7170863.

Ekici E, Moghimi S, Bowd C, Hou H, Penteado RC, Proudfoot JA, Yang D, Weinreb RN. (In Press). Capillary Density Measured by OCT Angiography in Glaucomatous Optic Disc Phenotypes. American Journal of Ophthalmology.

Fan BJ, Bailey JC, Igo RP Jr, Kang JH, Boumenna T, Brilliant MH, Budenz DL, Fingert JH, Gaasterland T, Gaasterland D, Hauser MA, Kraft P, Lee RK, Lichter PR, Liu Y, Moroi SE, Myers JS, Pericak-Vance MA, Realini A, Rhee DJ, Richards JE, Ritch R, Schuman JS, Scott WK, Singh K, Sit AJ, Vollrath D, Weinreb RN, Wollstein G, Zack DJ, Haines JL, Pasquale LR, Wiggs JL. Association of a Primary Open-Angle Glaucoma Genetic Risk Score with Earlier Age at Diagnosis. JAMA Ophthalmol. 2019;137:1190-1194.

Fard MA, Fakhraee G, Ghahvechian H, Sahraian A, Moghimi S, Ritch R. Macular Vascularity in Ischemic Optic Neuropathy Compared to Glaucoma by Projection-Resolved Optical Coherence Tomography Angiography. Am J Ophthalmol. 2020 Jan;209:27-34.

Fard MA, Yadegari S, Ghahvechian H, Moghimi S, Soltani-Moghaddam R, Subramanian PS. Optical Coherence Tomography Angiography of a Pale Optic Disc in Demyelinating Optic Neuritis and Ischemic Optic Neuropathy. J Neuroophthalmol. 2019 Sep;39(3):339-344.

Feldman RM, Cioffi GA, Liebmann JM, Weinreb RN. Current Knowledge and Attitudes Concerning Cost-Effectiveness In Glaucoma Pharmacotherapy: A Glaucoma Specialists Focus Group Study. Clin Ophthalmol. 2020;14:729-739. [PMCID: PMC7064281]

Genetics of Glaucoma in People of African Descent (GGLAD) Consortium, Hauser MA, Allingham RR, Aung T, Van Der Heide CJ, Taylor KD, Rotter JI, Wang SJ, Bonnemaijer PWM, Williams SE, Abdullahi SM, Abu-Amero KK, Anderson MG, Akafo S, Alhassan MB, Asimadu I, Ayyagari R, Bakayoko S, Nyamsi PB, Bowden DW, Bromley WC, Budenz DL, Carmichael TR, Challa P, Chen YI, Chuka-Okosa CM, Cooke Bailey JN, Costa VP, Cruz DA, DuBiner H, Ervin JF, Feldman RM, Flamme-Wiese M, Gaasterland DE, Garnai SJ, Girkin CA, Guirou N, Guo X, Haines JL, Hammond CJ, Herndon L, Hoffmann TJ, Hulette CM, Hydara A, Igo RP Jr, Jorgenson E, Kabwe J, Kilangalanga NJ, Kizor-Akaraiwe N, Kuchtey RW, Lamari H, Li Z, Liebmann JM, Liu Y, Loos RJF, Melo MB, Moroi SE, Msosa JM, Mullins RF, Nadkarni G, Napo A, Ng MCY, Nunes HF, Obeng-Nyarkoh E, Okeke A, Okeke S, Olaniyi O, Olawoye O, Oliveira MB, Pasquale LR, Perez-Grossmann RA, Pericak-Vance MA, Qin X, Ramsay M, Resnikoff S, Richards JE, Schimiti RB, Sim KS, Sponsel WE, Svidnicki PV, Thiadens AAHJ, Uche NJ, van Duijn CM, de Vasconcellos JPC, Wiggs JL, Zangwill LM, Risch N, Milea D, Ashaye A, Klaver CCW, Weinreb RN, Ashley Koch AE, Fingert JH, Khor CC. Association of Genetic Variants with Primary Open-angle Glaucoma among Individuals with African Ancestry. JAMA. 2019;322:1682-1691. [PMCID: PMC6865235]

Ghahari E, Bowd C, Zangwill LM, Proudfoot J, Hasenstab KA, Huiyuan H, Penteado RC, Manalastas PIC, Moghimi S, Takuhai S, Christopher M, Yarmohammadi A, Weinreb RN. Association of Macular and Circumpapillary Microvasculature with Visual Field Sensitivity in Advanced Glaucoma. Am J Ophthalmol. 2019;204:51-61.

Girkin CA, Fazio M, Bowd C, Medeiros FA, Weinreb RN, Liebmann JM, Proudfoot J, Zangwill LM, Belghith A. Racial Differences in the Association of Anterior Lamina Cribrosa Surface Depth and Glaucoma Severity in the African Descent and Glaucoma Evaluation Study (ADAGES). Invest Ophthalmol Vis Sci. 2019;60:4496-4502. [PMCID: PMC6819052]

Gopesh T, Camp AS, Unanian M, Friend J, Weinreb RN. Rapid and Accurate Pressure Sensing Device for Direct Measurement of Intraocular Pressure. Translational Vision Science & Technology. 2020;9(3):1-9.

Hou H, Moghimi S, Proudfoot JA, Ghahari E, Penteado RC, Bowd C, Yang D, Weinreb RN. Ganglion Cell Complex Thickness and Macular Vessel Density Loss in Primary Open-Angle Glaucoma. Ophthalmology. 2020; 13: S0161-6420(20)30014-2.

Hou H, Moghimi S, Zangwill LM, Proudfoot JA, Akagi T, Shoji T, Girkin CA, Liebmann JM, Weinreb RN. Association between Rates of Retinal Nerve Fiber Layer Thinning after Intraocular Pressure-Lowering Procedures and Disc Hemorrhage. Ophthalmol Glaucoma. 2020;3(1):7-13. PMCID: PMC7337275.

Ju WK, Edwards G, Perkins G, Kim KY, Kong Y, Choi SH, Skowronska-Krawczyk D, Weinreb R, Zangwill L, Strack S, Lee Y, Liu Y. Loss of AKAP1 Triggers Drp1 Dephosphorylation-mediated Mitochondrial Fission And Loss in Retinal Ganglion Cells. Cell Death Dis. 2020;11:254. [PMCID: PMC7170863]

Ju WK, Shim MS, Kim KY, Park TL, Ahn S, Edwards G, Weinreb RN. Inhibition of cAMP/PKA Pathway Protects Optic Nerve Head Astrocytes against Oxidative Stress by Akt/Bax Phosphorylation-Mediated Mfn1/2 Oligomerization. Oxid Med Cell Longev. 2019;2019:8060962. [PMCID: PMC6875302]

Khan KN, Borooah S, Iando L, Dans K, Mahroo OA, Meshi A, Kalitzeos A; Agorogiannis G; Moghimi S; Freeman WR; Webster AR; Moore AT; McKibbin M; Michaelides M. Quantifying the Separation Between the Retinal Pigment Epithelium and Bruch's Membrane using Optical Coherence Tomography in Patients with Inherited Macular Degeneration.Transl Vis Sci Technol. 2020 May

Kim HR, Weinreb RN, Zangwill LM, Suh MH. Characteristics of Focal Gamma Zone Parapapillary Atrophy. Invest Ophthalmol Vis Sci. 2020;61(3):17. PMID: 32176268.

Kim KY, Ju WK (2020) cAMP/PKA Pathway and Mitochondrial Protection in Oxidative Stress-induced Optic Nerve Head Astrocytes. Neural Regeneration Research. 16:1.

Lam AKN, To E, Weinreb RN, Yu M, Mak H, Lai G, Chiu V, Wu K, Zhang X, Cheng TPH, Guo PY, Leung CKS. Use of Virtual Reality Simulation to Identify Vision-Related Disability in Patients with Glaucoma. JAMA Ophthalmol. 2020;138:490-498.

Lee KM, Kim TW, Lee EJ, Girard MJA, Mari JM, Weinreb RN. Association of Corneal Hysteresis with Lamina Cribrosa Curvature in Primary Open Angle Glaucoma. Invest Ophthalmol Vis Sci. 2019;60:4171-4177.

Lee SS, Robinson MR, Weinreb RN. Episcleral Venous Pressure and the Ocular Hypotensive Effects of Topical and Intracameral Prostaglandin Analogs. J Glaucoma. 2019;28:846-857. [PMCID: PMC6735525]

Liebmann JM, Barton K, Weinreb RN, Eichenbaum DA, Gupta PK, McCabe CM, Wolfe JD, Ahmed I, Sheybani A, Craven ER. Evolving Guidelines for Intracameral Injection. J Glaucoma. 2020;29 Suppl 1:S1-S7.

Liu H, Li L, Wormstone IM, Qiao C, Zhang C, Liu P, Li S, Wang H, Mou D, Pang R, Yang D, Zangwill LM, Moghimi S, Hou J, Bowd C,Jiang L, Chen Y, Hu M, Xu Y, Kang H, Ji X, Chang R, Tham C, Cheung C, Ting DSW, Wong TY, Wang Z, Weinreb RN, Xu M, Wang N. Development and Validation of a Deep Learning System to Detect Glaucomatous Optic Neuropathy Using Fundus Photographs. JAMA Ophthalmol. 2019;137:1353-1360. PMCID: PMC6743057.

Lu GJ, Chou LD, Malounda D, Patel A, Welsbie D. et al. Genetically Encodable Contrast Agents for Optical Coherence Tomography [published online ahead of print, 2020 Feb 10]. ACS Nano.

Mahmoudinezhad G, Moghimi S, Weinreb RN. Covid-19 Pandemic: Are We Back to Normal? J Glaucoma. 2020 Jun 23.

Mansouri K, Tanna AP, De Moraes CG, Camp AS, Weinreb RN. Review of the Measurement and Management of 24-hour Intraocular Pressure in Patients with Glaucoma. Surv Ophthalmol. 2020;65:171-186.

Mao Y, Yang D, Li J, Liu J, Hou R, Zhang Z, Yang Y, Tian L, Weinreb R, Wang N. Finite Element Analysis of Trans-lamina Cribrosa Pressure Difference on Optic Nerve Head Biomechanics: The Beijing Intracranial and Intraocular Pressure study. Springer Nature. 2020.

Miki A, Yasukura Y, Weinreb RN, Maeda N, Yamada T, Koh S, Asai T, Ikuno Y, Nishida K. Dynamic Scheimpflug Ocular Biomechanical Parameters in Untreated Primary Open Angle Glaucoma Eyes. Invest Ophthalmol Vis Sci. 2020;61:19.

Miki A, Yasukura Y, Weinreb RN, Yamada T, Koh S, Asai T, Ikuno Y, Maeda N, Nishida K. Dynamic Scheimpflug Ocular Biomechanical Parameters in Healthy and Medically Controlled Glaucoma Eyes. J Glaucoma. 2019;28:588-592.

Moghimi S, Bowd C, Zangwill LM, Penteado RC, Hasenstab K, Hou H, Ghahari E, Manalastas PIC, Proudfoot J, Weinreb RN. Measurement Floors and Dynamic Ranges of OCT and OCT Angiography in Glaucoma. Ophthalmology. 2019;126:980-988. [PMCID: PMC6589389]

Moghimi S, Fatehi N, Nguyen AH, Romero P, Caprioli J, Nouri-Mahdavi K. Relationship of the Macular Ganglion Cell and Inner Plexiform Layers in Healthy and Glaucoma Eyes. Transl Vis Sci Technol. 2019 Oct 17;8(5):27.

Moghimi S, SafiZadeh M, Xu BY, Fard MA, Khatibi N, Rao HL, Weinreb RN. Vessel Density and Retinal Nerve Fibre Layer Thickness Following Acute Primary Angle Closure. Br J Ophthalmol. 2020 Aug;104(8):1103-1108.

Moghimi S, Weinreb RN. In Reply: Comparison of Fellow Eye of Acute Primary Angle Closure and Phacomorphic Angle Closure.J Glaucoma. 2020 Feb 19.

Moghimi S, Zangwill LM, Hou H, Wong B, Proudfoot J, Penteado RC, Ekici E, Bowd C, Weinreb RN. Comparison of Peripapillary Capillary Density in Glaucoma Patients of African and European descent. Ophthalmol Glaucoma. 2020 Jul

Penteado RC, Bowd C, Proudfoot J, Moghimi S, Manalastas PIC, Ghahari E, Hou H, Shoji T, Zangwill LM, Weinreb RN. Diagnostic Ability of Optical Coherence Tomography Angiography Macula Vessel Density for the Diagnosis of Glaucoma Using Difference Scan Sizes. J Glaucoma. 2020;29:245-251.

Ramkumar HL, Koduri M, Conger J, Ferreyra H, Saunders L, Robbins SL, Granet D, Freeman WR, Weinreb RN, Nudleman E. Comparison of Digital Widefield Retinal Imagine with Indirect Ophthalmoscopy in Pediatric Patients. Ophthalmic Surg Lasers Imaging Retina. 2019;50:580-585.

Rao H, Mansouri K, Weinreb R. OCT in Glaucoma. In: Grzybowski A, Barboni P (eds). OCT and Imaging in Central Nervous System Diseases: The Eye as a Window to the Brain. Cham: Springer Nature Switzerland AG. 2020.

Rao HL, Pradhan Z, Suh MH, Moghimi S, Mansouri K, Weinreb RN. Optical Coherence Tomography Angiography in Glaucoma. J Glaucoma. 2020;29:312-321.

Riva I, Galli F, Biagioli E, Rulli E, Longo A, Uva MG, Oddone F, Michelessi M, Weinreb RN, Quaranta L. The Glaucoma Italian Pediatric Study (GIPSy): The Long-term Effect of Topical Latanoprost on Central Corneal Thickness. J Glaucoma. 2020;29:441-447.

Riva I, Legramandi L, Rulli E, Konstas AG, Katsanos A, Oddone F, Weinreb RN, Quaranta L; Italian Study Group on QoL in Glaucoma. Vision-related quality of life and symptom perception change over time in newly-diagnosed primary open angle glaucoma patients. Sci Rep. 2020;10:4517. [PMCID: PMC7060282]

Rocha LR, Nguyen Huu VA, Palomino La Torre C, Xu Q, Jabari M, Krawczyk M, Weinreb RN, Skowronska-Krawczyk D. Early Removal of Senescent Cells

Protects Retinal Ganglion Cells Loss in Experimental Ocular Hypertension. Aging Cell. 2020;19:e13089. [PMCID: PMC6996954]

Rufer F, Gillmann K, Choritz L, Thieme H, Weinreb RN, Mansouri K. The Value of Intraocular Pressure Telemetry in Monitoring the Therapeutic Effect of Glaucoma Medications. J Glaucoma. 2020;29:e38-e40.

Rulli E, Quaranta L, Riva I, Poli D, Hollander L, Galli F, Katsanos A, Oddone F, Torri V, Weinreb RN; Italian Study Group on QoL in Glaucoma. Visual Field Loss and Vision-Related Quality of Life in the Italian Primary Open Angle Glaucoma Study. Sci Rep. 2020;10:3189. [PMCID: PMC7035370]

Shariflou S, Agar A, Rose K, Bowd C, Golzan SM (2020). Objective Quantification of Spontaneous Retinal Venous Pulsation Using a Novel Tablet-Based Ophthalmoscope. Translational Vision Science & Technology, 9(4), Article 19, 1-9

Shukla AG, De Moraes CG, Cioffi G, Girkin CA, Weinreb R, Zangwill L, Liebmann JM. The Relationship between Intraocular Pressure and Rates of Central Versus Peripheral Visual Field Progression. J Glaucoma. 2020;29:435-440.

Shukla AG, Sirinek PE, De Moraes CG, Blumberg DM, Cioffi GA, Skaat A, Girkin C, Weinreb RN, Zangwill LM, Hood DC, Liebmann JM. Disc Hemorrhages Are Associated with the Presence and Progression of Glaucomatous Central Visual Field Defects. J Glaucoma. 2020;29:429-434.

Suh MH, Na JH, Zangwill LM, Weinreb RN. Deep-layer Microvasculature Dropout in Pre-Perimetric Glaucoma Patients. J Glaucoma. 2020;29:423-428.

Thakur A, Goldbaum M, Yousefi S. Convex Representations Using Deep Archetypal Analysis for Predicting Glaucoma. IEEE J Transl Eng Health Med. 2020 May 28;8:3800107. doi: 10.1109/JTEHM.2020.2982150. PMCID: PMC7316201

Venugopal JP, Rao HL, Weinreb RN, Dasari S, Riyazuddin M, Pradhan ZS, Puttaiah NK, Devi S, Mansouri K, Webers CAB. Repeatability and Comparability of Peripapillary Vessel Density Measurements of High-density and Non-high-density Optical Coherence Tomography Angiography Scans in Normal and Glaucoma Eyes. Br J Ophthalmol. 2019;103:949-954.

Villatoro G, Bowd C, Proudfoot JA, Manalastas PIC, Nguyen KD, Hou H, Penteado RC, Li AJ, Moghimi S, Ghahari E, Weinreb RN, Zangwill LM. (In Press). Impact of Pupil Dilation on Optical Coherence Tomography Angiography Retinal Microvasculature in Healthy Eyes. Journal of Glaucoma.

Weinreb RN, Bacharach J, Fechtner RD, Kahook MY, Wirta D, Burmaster S, Meng X, Hubatsch DA. 24-hour Intraocular Pressure Control with Fixed-dose Combination Brinzolamide 1%/Brimonidine 0.2%: a Multicenter, Randomized Trial. Ophthalmology. 2019;126:1095-1104.

Weinreb RN, Bowd C, Moghimi S, Tafreshi A, Rausch S, Zangwill LM. Ophthalmic diagnostic imaging: Glaucoma. In: Bille JF (ed). High Resolution Imaging in Microscopy and Ophthalmology: New Frontiers in Biomedical Optics. Cham: Springer Nature Switzerland AG. 2019. pp. 107-134.

Weinreb RN, Mahmoudinezhad G, Moghimi S. Covid-19 Pandemic: Are We Back to Normal? J Glaucoma. 2020. Citation pending.

Weinreb RN, Robinson MR, Dibas M, Stamer WD. Matrix Metalloproteinases and Glaucoma Treatment. J Ocular Pharm Ther. 2020;36:208-228. [PMCID: PMC7232675]

Weinreb RN. El Futuro del Glaucoma. In: Júlvez LEP, Lerner SF, García Feijóo (eds.) Glaucoma. Ciudad Autonoma de Buenos Aires. Ediciones Journal. 2020;483-485.

Weinreb RN. Memories. In: Bille JF (ed). High Resolution Imaging in Microscopy and Ophthalmology: New Frontiers in Biomedical Optics. Cham: Springer Nature Switzerland AG. 2019. pp. vii-ix.

Wong BJ, Moghimi S, Zangwill LM, Christopher M, Belghith A, Ekici E, Bowd C, Fazio MA, Girkin CA, Weinreb RN. Relationship of Corneal Hysteresis and Anterior Lamina Cribrosa Displacement in Glaucoma. Am J Ophthalmol. 2020;212:134-143.

Wu Z, Medeiros FA, Weinreb RN, Girkin CA, Zangwill LM. Specificity of Various Cluster Criteria Used for the Detection of Glaucomatous Visual Field Abnormalities. Br J Ophthalmol. 2020;104(6):822-6. PMID: 31530565.

Xu BY, Pardeshi AA, Shan J, DeBoer C, Moghimi S, Richter G, McKean-Cowdin R, Varma R. Effect of Angle Narrowing on Sectoral Variation of Anterior Chamber Angle Width: The Chinese American Eye Study. Ophthalmol Glaucoma. 2020 Mar-Apr;3(2):130-138.

Xu BY; Chiang M; Pardeshi AA; Moghimi S; Varma R. Deep Neural Network for Scleral Spur Detection in Anterior Segment OCT Images: The Chinese American Eye Study. Transl Vis Sci Technol. 2020 Mar

Yang D, Liu JHK, Wang N, Weinreb RN. Correlation between Office Hour and Peak Nocturnal Intraocular Pressures in Patients Treated with Prostaglandin Analogs. Am J Ophthalmol 2020;215:112-117. doi: 10.1016/j.ajo.2020.02.010. PMID: 32087142.

Yoshikawa Y, Shoji T, Kanno J, Ibuki H, Weinreb RN, Araie M, Shinoda K. Glaucomatous Vertical Vessel Density Asymmetry of the Temporal Raphe Detected with Optical Coherence Tomography Angiography. Sci Reports. 2020;10:6845. [PMCID: PMC7176726]

INFORMATICS (BIOMEDICAL)

Aguilar-Rivera M, Erudaitius DT, Wu VM, Tantiongloc JC, Kang DY, Coleman TP, Baxter SL, Weinreb RN. Smart Electronic Eyedrop Bottle for Unobtrusive Monitoring of Glaucoma Medication Adherence. Sensors (Basel). 2020 Apr 30; 20(9):E2570. doi: 10.3390/s20092570. [PMCID: PMC7248824.]

Baxter SL, Gali HE, Chiang MF, Hribar MR, Ohno-Machado L, El-Kareh R, Huang AE, Chen HE, Camp AS, Kikkawa DO, Korn BS, Lee JE, Longhurst CA, Millen M. Promoting Quality Face-to-Face Communication during Ophthalmology Encounters in the Electronic Health Record Era. Appl Clin Inform. 2020 Jan;11(1):130-141. doi: 10.1055/s-0040-1701255. Epub 2020 Feb 19.

Baxter SL, Gali HE, Huang AE, Millen M, El-Kareh R, Nudleman E, Robbins SR, Heichel CWD, Camp AS, Korn BS, Lee JE, Kikkawa DO, Longhurst CA, Chiang MF, Hribar MR, Ohno-Machado L. Time Requirements of Paper-based Clinical Workflows and after-hours Documentation in a Multi-Specialty Academic Ophthalmology Practice. Am J Ophthalmol. 2019 Oct;206:161-167. doi: 10.1016/j.ajo.2019.03.014.

Baxter SL, Gali HE, Mehta MC, Rudkin SE, Bartlett J, Brandt JD, Sun CQ, Millen M, Longhurst CA. Multi-center Analysis of Electronic Health Record Use among Ophthalmologists. Ophthalmology.

2020 Jun 7:S0161-6420(20)30523-6. doi: 10.1016/j.ophtha.2020.06.007.

Baxter SL, Marks C, Kuo T-T, Ohno-Machado L, Weinreb RN. Machine Learning-based Predictive Modeling of Surgical Intervention in Glaucoma Using Systemic Data from Electronic Health Records. Am J Ophthalmol. 2019 Jul 16. pii: S0002-9394(19)30328-9. doi:10.1016/j.ajo. 2019.07.005.

Gali HE, Baxter SL, Lander L, Huang AE, Millen M, El-Kareh R, Nudleman E, Chao DL, Robbins SR, Heichel CWD, Camp AS, Korn BS, Lee JE, Kikkawa DO, Longhurst CA, Chiang MF, Hribar MR, Ohno-Machado L. Impact of Electronic Health Record Implementation on Ophthalmology Trainee Time Expenditures. J Acad Ophthalmol. 2019;11(02):e65-e72. doi:10.1055/s-0039-3401986.

Lander L, Baxter SL, Cochran GR, Gali HE, Cook K, Hatch T, Taylor R, Awdishu L. Self-perceptions of Readiness to Use Electronic Health Records among Medical Students: A Survey Study. JMIR Med Educ. 2020 Jun 12;6(1):e17585. doi: 10.2196/17585. [PMCID: PMC7320310.]

Sinsky CA, Rule A, Cohen G, Arndt B, Shanafelt T, Sharp CD, Baxter SL, Tai-Seale M, Yan S, Chen Y, Adler-Milsten J, Hribar MR. Metrics for Assessing Physician Activity Using EHR Log Data. J Am Med Inform Assoc. 2020 Apr 1;27(4):639-643. doi: 10.1093/jamia/ocz223. [PMCID: PMC7075531.]

NEURO-OPHTHALMOLOGY

Danesh-Meyer HV, Yoon JJ, Lawlor M, Savino PJ. Visual Loss and Recovery in Chiasmal Compression. Prog Retin Eye Res. 2019 Nov;73:100765. doi: 10.1016/j.preteyeres.2019.06.001.

Isen DR, Kline LB. Neuro-ophthalmic Manifestations of Wernicke Encephalopathy. Eye Brain. 2020 Jun 30;12:49-60. doi: 10.2147/EB.S234078. eCollection 2020. PMID: 32636690 Free PMC article. Review.

Kline LB. Int Ophthalmol Clin. 2019 Summer;59(3):1. doi: 10.1097/IIO.0000000000000273. PMID: 31233412 No abstract available. Vision Loss as a Presenting Feature of Wernicke Encephalopathy.

Kline LB. The Legacy of William F. Hoyt, MD. J Neuroophthalmol. 2020 Sep;40 Suppl 1:S1-S2. doi: 10.1097/WNO.0000000000000989. PMID: 32796338 No abstract available.

Rutstein RP, Kline LB. Adult-Onset Diplopia: Often Forgotten Causes. J Neuroophthalmol. 2019 Dec;39(4):441-443. doi: 10.1097/WNO.0000000000000867. PMID: 31790371 No abstract available. Preface.

Sura AA, Cure JK, Kline LB. J Neuroophthalmol. 2019 Sep;39(3):380-382. doi: 10.1097/WNO.0000000000000771. PMID: 30829946 No abstract available.

Vaphiades MS, Al-Sadah ZM, Kline LB. Nonarteritic Anterior Ischemic Optic Neuropathy: Exceptions to the Rules. J Neuroophthalmol. 2020 Apr 15. doi: 10.1097/WNO.0000000000000949. Online ahead of print. PMID: 32441900 No abstract available.

Vu VN, Savino PJ, Robbins SL. Bilateral Abducens Nerve Palsy Due to Septic Thrombophlebitis. Am J Ophthalmol Case Rep. 2019 Oct 31;16:100566. doi: 10.1016/j.ajoc.2019.100566. PMCID: PMC6849129.

Walsh JT, Robbins SL, Savino PJ. Visual Field Loss in a Patient with Optic Disc Cupping. JAMA Ophthalmol. 2019 Jul 1;137(7):844-845. doi: 10.1001/jamaophthalmol.2019.1173.

Wang MTM, King J, Symons RCA, Stylli SS, Meyer J, Daniell MD, Savino PJ, Kaye AH, Danesh-Meyer HV. Prognostic Utility of Optical Coherence Tomography for Long-Term Visual Recovery Following Pituitary Tumor Surgery. Am J Ophthalmol. 2020 Oct;218:247-254. doi: 10.1016/j.ajo.2020.06.004.

OCULOPLASTICS

Chang M, Gould A, Gur Z, Buhbut O, Hosalkar H, Liu CY, Korn BS, Kikkawa DO. Does Intraoperative Ketorolac Increase Bleeding in Oculoplastic Surgery? Ophthalmic Plast Reconstr Surg. 2019 Nov 27.

Chen AJ, Baxter SL, Gali HE, Long CP, Ozzello DJ, Liu CY, Korn BS, Kikkawa DO. Evaluation of Electronic Health Record Implementation in an Academic Oculoplastics Practice. Ophthalmic Plast Reconstr Surg. 2019 Nov 27.

Chen AJ, Chung NN, Liu CY, MacIntosh PW, Korn BS, Kikkawa DO. Precision in Oculofacial Surgery: Made-To-Specification Cast-Molded Implants in Orbital Reconstruction. Ophthalmic Plast Reconstr Surg. 2019 Nov 18.

Chen AJ, Ediriwickrema LS, Verma R, Vavinskaya V, Shaftel S, Deconde AS, Korn BS, Kikkawa DO, Liu CY. A Case of Mistaken Identity: Saksenaea Vasiformis of the Orbit. Orbit. 2020 Aug 30:1-4. doi: 10.1080/01676830.2020.1814354. Online ahead of print.

Chen Y, Al-Sadah Z, Kikkawa DO, Lee BW. A Modified Hughes Flap for Correction of Refractory Cicatricial Lower Lid Retraction with Concomitant Ectropion. Ophthalmic Plast Reconstr Surg. 2020 Sep/Oct;36(5):503-507. doi: 10.1097/IOP.0000000000001633.

Ediriwickrema LS, Liu CY, Kikkawa DO, Korn BS. Development of Poliosis Following Checkpoint Inhibitor Treatment for Cutaneous Melanoma. Ophthalmic Plast Reconstr Surg. 2019 Sep/Oct;35(5):e121-e122. doi: 10.1097/IOP.0000000000001451.

Gur Z, Liu CY, Korn BS, Kikkawa DO. Exposed Scleral Buckle Causing Atypical Mycobacterial Infection. Ophthal Plast Reconstr Surg. 2019 Nov 18.

Lee JS, Chae MK, Kikkawa DO, Lee EJ, Yoon JS. Glycogen Synthase Kinase-3β Mediates Proinflammatory Cytokine Secretion and Adipogenesis in Orbital Fibroblasts from Patients with Graves' Orbitopathy. Invest Ophthalmol Vis Sci. 2020 Jul 1;61(8):51. doi: 10.1167/iovs.61.8.51. PMCID: PMC7426624.

Long CP, Lu T, Ediriwickrema LS, Lin JH, Korn BS, Kikkawa DO and Liu, CY. Colorectal Carcinoma Presenting in the Orbit: Mass Effect from an Uncommon Cause [published online ahead of print, 2020 Jul 9]. Orbit. 2020;1-4.

Men CJ, Ediriwickrema LS, Paik JS, Murdock J, Yen MT, Ng JD, Liu CY, Korn BS, Kikkawa DO. Surgical Intervention of Periocular Infantile Hemangiomas in the Era of β-Blockers. Ophthalmic Plast Reconstr Surg. 2020 Jan/Feb;36(1):70-73.

Men CJ, Ko AC, Ediriwickrema LS, Liu CY, Kikkawa DO, Korn BS. Canalicular Laceration Repair Using a Self-retaining, Bicanalicular, Hydrophilic Nasolacrimal Stent [published online ahead of print, 2020 May 20]. Orbit. 2020;1-4. doi:10.1080/01676830.2020.1768559.

Men CJ, Wu F, Lee BW, Lin JH, Korn BS, Kikkawa DO. Odontogenic Choristoma Presenting as Dermolipoma. Orbit. 2019 Dec;38(6):492-494.

Mimura M, Alameddine RM, Korn BS, Kikkawa DO, Oku H, Sato B, Ikeda T. Endoscopic

Evaluation of Lacrimal Mucosa with Indigo Carmine Stain. Ophthalmic Plast Reconstr Surg. 2020 Jan/Feb;36(1):49-54. doi: 10.1097/IOP.0000000000001457.

Mimura M, Ko AC, Alameddine RM, Korn BS, Kikkawa DO, Oku H, Sato B, Ikeda T. Newly Designed Universal Trans-punctal Rigid Lacrimal Microendoscope [published online ahead of print, 2020 Apr 3]. Ophthalmic Plast Reconstr Surg. 2020;10.1097/IOP.0000000000001653. doi:10.1097/IOP.0000000000001653.

Mimura M, Yang PT, Ko AC, Korn BS, Kikkawa DO. Analysis of Periorbital Soft Tissue in Thyroid Eye Disease. Ophthalmic Plast Reconstr Surg. 2020 Jan/Feb;36(1):30-33, 49-54. doi: 10.1097/IOP.0000000000001450.

Ozzello DJ, Kikkawa DO, Korn BS. Early Experience with Teprotumumab for Chronic Thyroid Eye Disease. Am. Journ Ophthal. 2020; 17.

Prendes MA, Geng J, Ediriwickrema LS, Areephanthu C, Burchell P, Kikkawa DO, Nunery WR, Korn B, Harold Lee HB. Assessment of the Safety and Efficacy of Prolapsed Orbital Fat Resection During Involutional Entropion Repair. Ophthalmic Plast Reconstr Surg. 2020 Jan/Feb;36(1):34-37. doi: 10.1097/IOP.0000000000001452.

Toomey CB, Protopsaltis NJ, Phou S, Bakhoum MF, Thorson JA, Ediriwickrema LS, Korn BS, Kikkawa DO, Goldbaum MH, Lin JH. Prevalence of Mismatch Repair Gene Mutations in Uveal Melanoma. Retina. 2020 Feb 6.

Topilow NJ, Chen Y, Korn BS, Kikkawa DO, Lee BW. Re: "Stereotactic Navigation Improves Outcomes of Orbital Decompression Surgery for Thyroid Associated Orbitopathy". Ophthalmic Plast Reconstr Surg. 2020 Sep/Oct;36(5):520-521. doi: 10.1097/IOP.0000000000001810.

Yarmohammadi A, Baxter SL, Ediriwickrema LS, Williams EC, Kobayashi LM, Liu CY, Korn BS, Kikkawa DO. Characterization of Facial Trauma Associated with Standing Electric Scooter Injuries [published online ahead of print, 2020 Feb 14]. Ophthalmology. 2020;S0161-6420(20)30165-2. doi:10.1016/j.ophtha.2020.02.007.

PEDIATRIC OPHTHALMOLOGY

Hennein L, Robbins SL. Heavy Eye Syndrome. Surv Ophthalmol 2020 Jun 6;S0039-6257(20)30097-7. Doi:10.1016/j.survophthal. 2020.06.001 [Online ahead of print]

Kinori M, Pansara M, Mai DD, Robbins SL, Hesselink JR, Granet DB. Inferior Rectus Displacement in Heavy Eye Syndrome and Sagging Eye Syndrome. Graefe's Archive for Clinical and Experimental Ophthalmol. 2020 May;258(5):1109-1113.

Kinori M, Robbins SL. Esotropia. Ophthalmology, 5th edition. Elsevier. Yanoff M, Duker J, eds. London, UK. 2019. 1210-1217.

Maduram A, Farid N, Rackow-Penner R, Ghassemi N, Khanna P, Robbins SL, Hull A, Gold J, Pretorius D. Fetal Ultrasound and MRI Findings in Septo-optic Dysplasia: A Diagnostic Dilemma. Journal of Ultrasound Medicine 2020 Mar. Doi:10.1002/jum.15252.

Miller KE, Robbins SL. 'Ophthalmology' in Pediatric Board Study Guide: A Last Minute Review, 2nd Edition. Editor: Osama I. Naga. Publisher: Springer 2020. 585-609

Pan J, Barry G, Bhatt A, Scheier A, Mulvill A, Robbins SL, Coleman K, Richards A. Corneal Complications in preterm infants J AAPOS. August 2019 Vol 22, Issue 4, e38. Doi: 10.106/j jaapos.2018.07.134.

Ramkumar HL, Koduri M, Conger J, Robbins SL, Granet D, Freeman WR, Saunders L, Ferreyra H, Weinreb RN, Nudleman E. Comparison of Digital Widefield Retinal Imaging with Indirect Ophthalmoscopy in Pediatric Patients. Ophthalmic Surg Lasers Imaging Retina. 2019 Sep 1;50(9):580-585. Doi:10.3928/23258160-20190905-07.

Robbins SL, Wang JW, Frazer JR, Greenberg M. Anticoagulation: A Practical Guide for Strabismus Surgeons. J AAPOS 2019 Aug; 23(4):193-199.Doi: 10.1016/j.jaapos.2018.12.008.

Robbins SL. Techniques of Strabismus Surgery. Ophthalmology, 5th edition. Yanoff M, Duker J, eds. Elsevier. 2019. 1247-1258.

Robbins, SL, Contributor. Telehealth Visits Allow Patients to Connect to Care During COVID-19, Lifesaving Screening. Article appeared in UC San Diego News Center weekly news update. May 2020. Robbins, SL. Ophthalmology, Fifth Edition. Yanoff M, Duker JS eds. Elsevier. Section Editor for Strabismus section. London, UK. 2019. 1189-1258.

Rudell JC, Stager Jr D, Felius J, McLoon LK. Morphological Differences in the Inferior Oblique Muscles from Subjects with Overelevation in Adduction. IOVS. 2020 June 3;61(3):33. [PMCID 32539136].

Serafino M, Granet DB, Kushner BJ, Dagi LR, Kekunnaya R, Nucci P. Use of the Delphi Process for Defining Successful Outcomes for Strabismus Surgery. J AAPOS. 2019 Dec;23(6):309-312.

Vu VN, Savino PJ, Robbins SL. Bilateral Abducens Nerve Palsy Due to Septic Thrombophlebitis. Am J Ophthalmol Case Report 2019 Oct 31;16:100566. Doi: 10.1016/j.ajoc.2019.100566.

Walsh J, Robbins SL, Savino PJ. Visual Field Loss in a Patient with Optic Disc Cupping. JAMA Ophthalmology. 2019 Jul 1:137(7):844-845. Doi: 10.1001/jamaophthalmol.2019.1173.

REGENERATIVE OPHTHALMOLOGY

Foster J, Wahlin KJ, Shakravarti S. A Guide to the Development of Human Cornea Organoids from Induced Pluripotent Stem Cells in Culture. Methods Molecular Biology, Vol. 2145. June 2020.

Huang KC, Wang ML, Chen SJ, Kuo JC, Wang WJ, Nhi Nguyen PN, Wahlin KJ, Lu JF, Tran AA, Shi M, Chien Y, Yarmishyn AA, Tsai PH, Yang TC, Jane WN, Chang CC, Peng CH, Schlaeger TM, Chiou SH. Morphological and Molecular Defects in Human Three-Dimensional Retinal Organoid Model of X-Linked Juvenile Retinoschisis. Stem Cell Reports. 2019 Nov 12;13(5):906-923. doi: 10.1016/j.stemcr.2019.09.010. Epub 2019 Oct 24. PubMed PMID: 31668851; PubMed Central PMCID: PMC6895767.

Mishra B, Wilson DR, Sripathi S, Suprenant MP, Rui Y, Wahlin KJ, Berlinicke CA, Green JJ, Zack DJ. A Combinatorial Library of Biodegradable Polyesters Enables Non-viral Gene Delivery to Post-Mitotic Human Stem Cell-Derived Polarized RPE Monolayers. Regen. Eng. Transl. Med. (2019).

SIX6 Regulation in Human Optic Vesicles is Mediated by early Microenvironment Factors. A Tet-inducible CRISPR Platform for High-fidelity Editing of Human Pluripotent Stem Cells.

RETINA

Amador-Patarroyo MJ, Lin T, Meshi A, Dans KC, Chen K, Borooah S, Molano-Gonzalez N, Díaz-Rojas JA,

Freeman WR. Identifying the Factors for Improving Quality of Oral Fluorescein Angiography. 2020 Apr;104(4):504-508. [PMID: 31272951]

Cavichini M, Dans KC, Jhingan M, Amador-Patarroyo MJ, Borooah S, Bartsch DU, Nudleman E, Freeman WR. Evaluation of the Clinical Utility of Optical Coherence Tomography Angiography in Age-related Macular Degeneration. Br J Ophthalmol. 2020 Aug 21:bjophthalmol-2020-316622. doi: 10.1136/bjophthalmol-2020-316622. Online ahead of print. PMID: 32826223.

Chan AX, Yeh K, Bakhoum M, Do JL. Pseudophakic Glaucoma and Angle Closure in a Patient with an Anterior Chamber Intraocular Lens. Am J Ophthalmol Case Rep. 2020 Aug 16;20:100877. doi: 10.1016/j.ajoc.2020.100877. eCollection 2020 Dec. PMID: 32875158 Free PMC article.

Chao DL, Burr A, Pennesi MP. RPE-65-related Leber Congenital Amaurosis/early-onset Severe Retinal Dystrophy. Gene Reviews In: Adam MP, Ardinger HH, Pagon RA, Wallace SE, Bean LJH, Stephens K, Amemiya A, editors. GeneReviews®[Internet]. Seattle (WA): University of Washington, Seattle; 1993-2020. 2019 Nov 14.

Chao DL, Skowronksa-Krawczyk D. ELOVL2: Not Just a Biomarker of Aging. Translational Medicine of Aging; 2020, Volume 4:78-80.

Chekuri A, Sahu B, Chavali VRM, Voronchikhina M, Soto-Hermida A, Suk JJ, Alapati AN, Bartsch DU, Ayala-Ramirez R, Zenteno JC, Dinculescu A, Jablonski MM, Borooah S, Ayyagari R. Long-Term Effects of Gene Therapy in a Novel Mouse Model of Human MFRP-Associated Retinopathy. Hum Gene Ther. 2019 May;30(5):632-650. doi: 10.1089/hum.2018.192. Epub 2019 Jan 16. PMID: 30499344 Free PMC article.

Chekuri A, Zientara-Rytter K, Soto-Hermida A, Borooah S, Voronchikhina M, Biswas P, Kumar V, Goodsell D, Hayward C, Shaw P, Stanton C, Garland D, Subramani S, Ayyagari R. Late-Onset Retinal Degeneration Pathology Due to Mutations in CTRP5 Is Mediated through HTRA1. Aging Cell. 2019 Dec;18 (6):e13011. doi: 10.1111/acel.13011. [PMCID: PMC6826137]

Chen D*, Chao DL* , Rocha L, Kolar M, Nguyen Huu VA, Krawczyk M, Dasyani M, Wang T, Jafari M, Jabari M, Ross KD, Saghatelian A, Hamilton BA, Zhang K, Skowronska-Krawczyk D. The Lipid Elongation Enzyme ELOVL2 is a Molecular Regulator of Aging in the Retina. Aging Cell. 2020 Jan 14:e13100. *co-first authors

Freeman WR, Chen KC, Ho J, Chao DL, Ferreyra HA, Tripathi AB, Nudleman E, Bartsch DU. Resolution, Depth of Field, and Physician Satisfaction During Digitally Assisted Vitreoretinal Surgery. Retina. 2019 Sep;39(9):1768-1771. doi: 10.1097/IAE.0000000000002236. PMID: 29965938 Free PMC article.

Hamad AE, Moinuddin O, Blair MP, Schechet SA, Shapiro MJ, Quiram PA, Mammo DA, Berrocal AM, Prakhunhungsit S, Cernichiaro-Espinosa LA, Mukai S, Yonekawa Y, Ung C, Holz ER, Harper CA 3rd, Young RC, Besirli CG, Nagiel A, Lee TC, Gupta MP, Walsh MK, Khawly JA, Campbell JP, Kychenthal A, Nudleman ED, Robinson JE, Hartnett ME, Calvo CM, Chang EY. Late-Onset Retinal Findings and Complications in Untreated Retinopathy of Prematurity. Ophthalmol Retina. 2020 Jun;4(6):602-612. doi: 10.1016/j.oret.2019.12.015.

Han J, Rinella NT, Chao DL. Anesthesia for Intravitreal Injection: A Systematic Review. Clinical Ophthalmology. 2020 Feb 26;14:543-550.

Honasoge A, Nudleman E, Smith M, Rajagopal R. Emerging Insights and Interventions for Diabetic Retinopathy. Curr Diab Rep. 2019 Sep 10;19(10):100. doi: 10.1007/s11892-019-1218-2.

Itatani Y, Zhong C, Yamamoto M, Molinolo AA, Ruppel J, Hegde P, Taketo MM, Ferrara N. Suppressing Neutrophil-dependent Angiogenesis, Abrogates Resistance to Anti-VEGF Antibody in a Genetic Model of Colorectal Cancer. Proc. Natl. Acad. Sci. USA, in press.

Khan K, Borooah S, Lando L, Dans K, Mahroo O, Meshi A, Kalitzeos A, Agorogiannis A, Moghimi S, Freeman W, Webster A, Moore A, McKibbin M, Michaelides M. Quantifying the Separation between the Retinal Pigment Epithelium and Bruch's Membrane using Optical Coherence Tomography in Patients with Inherited Macular Degeneration. Trans. Vis. Sci. Tech. 2020;9(6):26. doi: https://doi.org/10.1167/tvst.9.6.26.
Koulisis N, Moysidis SN, Yonekawa Y, Dai YL, Burkemper B, Wood EH, Lertjirachai I, Todorich B, Khundkar TZ, Chu Z, Wang RK, Williams GA, Drenser KA, Capone A Jr, Trese MT, Nudleman E. Correlating Changes in the Macular Microvasculature and Capillary Network to Peripheral Vascular Pathologic Features in Familial Exudative Vitreoretinopathy. Ophthalmol Retina. 2019 Jul;3(7):597-606. doi: 10.1016/j.oret.2019.02.013.

Lee EJ, Chiang WJ, Kroeger H, Bi CX, Chao DL, Skowronska-Krawczyk D, Mastey RR, Tsang SH, Chea L, Kim K, Lambert SR, Grandjean JM, Baumann B, Audo I, Kohl S, Moore AT, Wiseman RL, Carroll J, Lin JH. Multiexon Deletion Alleles of ATF6 Linked to Achromatopsia. JCI Insight. 2020 Apr 9;5(7). PMC7205249

Li Q, Li P, Biswas N, Chilla' A, Liu L, Xin H, Wang RK, Ferrara N. A Novel Facet of Blood Vessel Diversity: Endothelial Cell Type-specific Stat3 Signaling Determines Proliferation Inhibition or Stimulation. Submitted.

Lin T, Dans KC, Muftuoglu IK, Meshi A, Amador-Patarroyo MJ, Cheng L, Freeman WR. Factors Associated with Extended Remission in Neovascular Age-Related Macular Degeneration on Pro Re Nata Treatment Protocol. Br J Ophthalmol. 2020 Jan;104(1):58-63. doi: 10.1136/bjophthalmol-2018-313447. Epub 2019 Jul 13.PMID: 31302628.

Lu GJ, Chou LD, Malounda D, Patel AK, Welsbie DS, *Chao DL, *Ramalingam T, *Shapiro MG. Genetically Encodable Contrast Agents for Optical Coherence Tomography. ACS Nano. 2020 Feb 10. *Co-corresponding authors

Meshi A, Chen KC, You QS, Dans K, Lin T, Bartsch DU, Cheng L, Amador-Patarroyo MJ, Muftuoglu IK, Gomez ML, Nudleman E, Freeman WR. Anatomical and Functional Testing in Diabetic Patients without Retinopathy: Results of Optical Coherence Tomography Angiography and Visual Acuity Under Varying Contrast and Luminance Conditions. Retina. 2019 Oct;39(10):2022-2031. doi: 10.1097/IAE.0000000000002258. PMID: 30015764

Meshi A, Lin T, Dans K, Chen KC, Amador M, Hasenstab K, Muftuoglu IK, Nudleman E, Chao D, Bartsch DU, Freeman WR. Comparison of Retinal Pathology Visualization in Multispectral Scanning Laser Imaging. Retina. 2019 Jul;39(7):1333-1342. doi: 10.1097/IAE.0000000000002156. PMID: 29554078 Free PMC article.

Moore S, Skowronska-Krawczyk, Chao DL. RNA Therapeutics for Inherited Retinal Diseases. Advances in Experimental Biology in Medicine. 2019;1185:39-43.

Muftuoglu IK, Lin T, Nudleman E, Gaber R, Bartsch DU, Freeman WR. Identification of Factors Related to Subfoveal Detachment Secondary to Epiretinal Membrane. Retina. 2019 May;39(5):988-998. doi: 10.1097/IAE.0000000000002056. PMID: 29394236

Nadeem R, Kabir F, Li J, Gradstein L, Jiao X, Rauf B, Naeem MA, Assir MZ, Riazuddin S, Ayyagari R, Hejtmancik JF, Riazuddin SA. Mutations in CERKL and RP1 Cause Retinitis Pigmentosa in Pakistani Families. Hum Genome Var. 2020 May 12;7:14. doi: 10.1038/s41439-020-0100-8. [PMCID: PMC7217820]

Nguyen BJ, Chen WS, Chen AJ, Utt A, Hill E, Apgar R, Chao DL. Large-scale Assessment of Needs in Low Vision Individuals Using the Aira Assistive Technology. Clinical Ophthalmology. 2019 Sep 20;13:1853-1868.

Protopsaltis N, Liang W, Nudleman E, Ferrara N. Interleukin-22 Promotes Tumor Angiogenesis. Angiogenesis. 22, 311-323, 2019.

Rauf B, Irum B, Khan SY, Kabir F, Naeem MA, Riazuddin S, Ayyagari R, Riazuddin SA. Novel Mutations in LTBP2 Identified in Familial Cases of Primary Congenital Glaucoma. Mol Vis. 2020 Feb 24;26:14-25. [PMCID: PMC7043638]

Skowronska-Krawczyk D, Chao DL. Lipids and Aging in Macular Degeneration. Advances in Experimental Biology in Medicine. 2019;1185:39-43.

Smith EN, D'Antonio-Chronowska A, Greenwald WW, Borja V, Aguiar LR, Pogue R, Matsui H, Benaglio P, Borooah S, D'Antonio M, Ayyagari R, Frazer KA. Human iPSC-Derived Retinal Pigment Epithelium: A Model System for Prioritizing and Functionally Characterizing Causal Variants at AMD Risk Loci. Stem Cell Reports. 2019 Jun 11;12(6):1342-1353. doi: 10.1016/j.stemcr.2019.04.012. [PMCID: PMC6565613]

Strunz T, Lauwen S, Kiel C; International AMD Genomics Consortium (IAMDGC), Hollander AD, Weber BHF. A Transcriptome-Wide Association Study Based on 27 Tissues Identifies 106 Genes Potentially Relevant for Disease Pathology in Age-Related Macular Degeneration. Sci Rep. 2020 Jan 31;10(1):1584. doi: 10.1038/s41598-020-58510-9. PMCID: PMC6994629

Sun Z, Liu X, Bian C, Wu S, Cheng L. Sub-Tenon Depository Triamcinolone and Glycaemic Management in Diabetic Patients. Acta Ophthalmol. 2019 Nov;97(7):e1027-e1028. doi: 10.1111/aos.14100. Epub 2019 Mar 22.PMID: 30900817 No abstract available.

Toomey CB, Protopsaltis NJ, Phou S, Bakhoum MF, Thorson JA, Ediriwickrema LS, Korn BS, Kikkawa DO, Goldbaum MH, Lin JH. Prevalence of Mismatch Repair Gene Mutations in Uveal Melanoma. Retina. 2020 Feb 6. doi: 10.1097/IAE.0000000000002732. Online ahead of print.

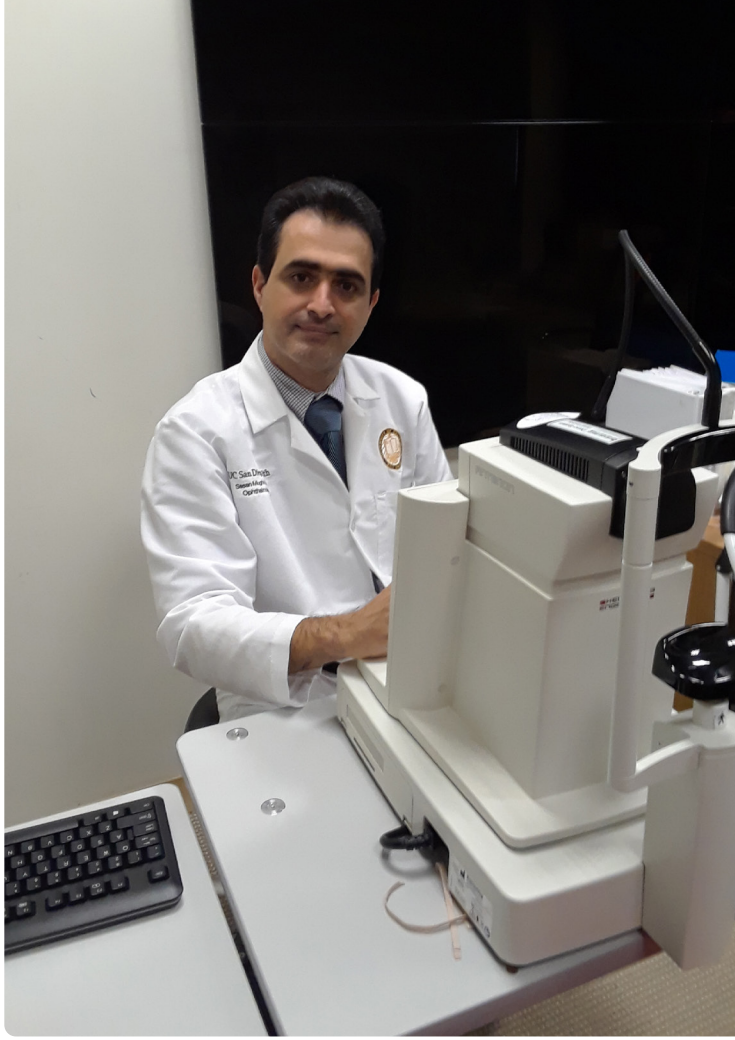
Xiao Y, Wang Y, Li F, Lin T, Huffman K, Landeros S, Bosse B, Jing Y, Bartsch DU, Thorogood S, Freeman WR, Cheng L. Acute Rabbit Eye Model for Testing Subretinal Prostheses. Transl Vis Sci Technol. 2019 Oct 2;8(5):20. doi: 10.1167/tvst.8.5.20. eCollection 2019 Sep. PMID: 31602345 Free PMC article.

Xin H, Biswas N, Li P, Zhong C, Nudleman E, Ferrara N. VEGFR1 Variants as Long-Acting VEGF Inhibitors for Treatment of Intraocular Neovascular Disorders. Proc. Natl. Acad. Sci. USA, in press.

Yi QY, Wang YY, Chen LS, Li WD, Shen Y, Jin Y, Yang J, Wang Y, Yuan J, Cheng L. Implication of Inflammatory Cytokines in the Aqueous Humour for Management of Macular Diseases. Acta Ophthalmol. 2020 May;98(3):e309-e315. doi: 10.1111/aos.14248. Epub 2019 Sep 18.PMID: 31531945.

Yuan J, Wu S, Wang Y, Pan S, Wang P, Cheng L. Inflammatory Cytokines in Highly Myopic Eyes. Sci Rep. 2019 Mar 5;9(1):3517. doi: 10.1038/s41598-019-39652-x.PMID: 30837544

Zhong C, Li P, Liang W, Xin H, Chilla A, Eliceiri B, Argade S, Choudhury B, Ferrara, N. Inhibition of Protein Glycosylation, a Novel Proangiogenic Strategy through Activation of Stress Pathways. Submitted.



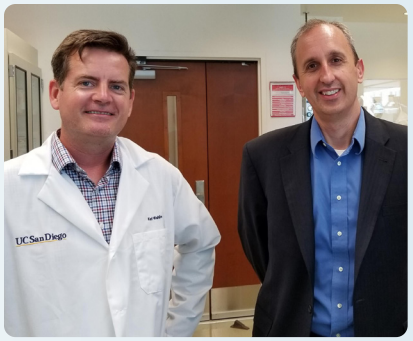
Sasan Moghimi, MD, Associate Professor of Ophthalmology, is a glaucoma expert with a special interest in imaging and angle closure glaucoma.

UPDATE

RICHARD C. ATKINSON LABORATORY FOR REGENERATIVE OPHTHALMOLOGY



Richard Atkinson, PhD, David Dunn, and Robert N. Weinreb, MD



Drs. Wahlin and Welsbie study macular degeneration, optic nerve injury, neurodegeneration and vision loss. Ultimate goals are to develop new medications and gene therapy based strategies to interfere with deleterious genes preventing nerve cell death. Combined they have published hundreds of peer reviewed articles in all the major scientific publications

NEURO-REGENERATION
Goal: Identify factors to prevent optic nerve cell death and improve regeneration
Progress: Using a Shiley patient's blood, they created stem cells and turned them into mini-retinas for additional study. They found a set of genes that promotes regeneration when blocked.
Next step: Develop gene "instructions" to create new optic nerve cells to treat both glaucoma and macular degeneration.

CRISPR SCREENING
Goal: Remove one gene at a time from DNA in optic nerve cells and record the effect on its survival to find which genes increase survival.
Progress: After screening 700 genes, they identified a pair of genes that impacts optic nerve cell death. They removed these genes and found the optic nerve cells survive longer.
Next step: Understand the function of these genes.

IMPACT OF AGING ON RETINAL DISEASE AND THERAPIES
Goal: Determine genetically how and why older (aged) optic nerve cells degenerate and disconnect from the brain.
Progress: They developed a drug that blocks the damaging genes. A single injection of the drug leads to unprecedented long-term survival in rodent models of optic nerve degeneration.
Next step: Develop ways to insert the new drug into the eye in preparation for clinical trials. If successful, this will be the first non-pressure based strategy to help the optic nerve cells live longer.

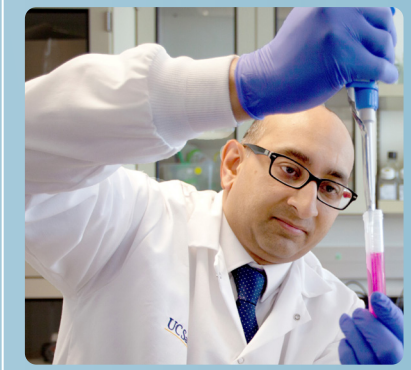
DRUG SCREENING FOR MACULAR DEGENERATION

Goal: Find new therapies for dry macular degeneration.
Progress: Using human stem cells to create retinal pigment epithelium cells-in-a-dish, they genetically modified the cells with CRISPR technology to have mutations that cause dry macular degeneration.
Next step: Develop a therapy to stop or interfere with the mutations leading to dry macular degeneration.

MODELING LEBER CONGENITAL AMAUROSIS

Goal: This disease affects children from birth and causes the death of retinal cells that are responsible for converting light to vision.
Progress: Utilizing the retinas-in-a-dish, they are modeling how this disease causes the death of the retinal cells.
Next step: Investigate this type of degeneration and find new treatment strategies.

Glaucoma is defined by the death of optic nerve cells that connect the brain and eye. Their loss leads to a progressive "disconnection" of the eye and vision loss. Thus, there are three goals for the development of new neuroprotective therapies: 1. Drugs that prevent optic nerve cell death; 2. Drugs that promote optic nerve cell regeneration; 3. Drugs that prevent optic nerve cell disconnection. The Welsbie lab has been interested in using high-throughput screening to identify drugs and drug targets for each of the three goals. For #1, we have identified a new drug target (i.e. "DLK" protein) and worked with industry to develop a new drug that is being tested in monkeys (it has already shown excellent activity in rodents). For #2, we have recently identified a set of new drug targets ("GCK-IV" proteins) and demonstrated that existing drugs that block GCK-IVs lead to impressive optic nerve cell regeneration. This work is currently under review for publication at the prestigious journal, *Proceedings of the National Academy of Science*. For #3, we are in the process of developing a new gene therapy approach to target a gene that is known to play a profound role in nerve cell degeneration. This work recently led to an invention disclosure with the University of California.



Dr. Borooah leads a laboratory research program developing novel therapies for inherited retinal degenerations and age-related macular degeneration. His successes include the demonstration of long term retinal protection using gene therapy in a model of childhood inherited retinal disease. His research accomplishments have been honored with multiple prestigious awards including a Rowling scholarship for translational medicine, a Foundation Fighting Blindness career development award and a Fulbright scholarship.

UNDERSTANDING THE CAUSE OF SUBRETINAL DEPOSITS WHICH RESULT IN MACULAR DEGENERATION

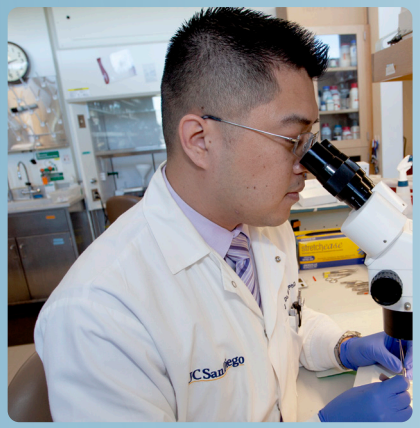
Goal: Identify the cause of disease using models of Dry and Wet macular degeneration
Progress: He identified changes in the immune system which are associated with subretinal deposits.
Next step: Repurpose FDA approved drugs to target the immune cells associated with macular degeneration to slow/prevent degeneration.

EARLY-ONSET INHERITED RETINAL DEGENERATION

Goal: Initiate gene replacement therapy for children going blind with inherited retinal disease.
Progress: Using gene replacement therapy, he slowed retinal degeneration in a laboratory model.
Next step: Develop clinical trials using gene therapy to preserve remaining vision in patients.

LATE-ONSET INHERITED RETINAL DEGENERATION

Goal: Use CRISPR gene editing to correct faulty genes which cause sight loss.
Progress: He has completed a long-term natural history study to identify the best time to treat patients with retinal degeneration.
Next step: The laboratory has recently developed retinal cells from patient stem cells. He will use this 'disease in a dish' model to test the effectiveness of gene correction. If successful, the plan is to translate this to clinical trials to treat disease to prevent sight loss.



Dr. Do has a scientific interest in regenerating the optic nerve and is developing research programs to restore vision. He uses novel stem cell technologies to replace components of the eye that are lost in glaucoma and to regenerate lost connections between the eye and the brain. His long-term goal is to develop translational therapies to restore vision and to help patients with blinding diseases.

STEM CELL DIFFERENTIATION

Goal: Restore vision by regenerating the connections (optic nerve stem cells) between the eye and the brain.
Progress: He developed a method to have optic nerve cells receive input from other nerve cells
Next step: Facilitate cell transplantation to improve survival of optic nerve cells.

TRANSPLANTATION

Goal: Develop process for transplanted cells to survive and grow within the eye that has macular degeneration or glaucoma eventually leading to whole eye transplantation.
Progress: He has developed methods to transplant stem cells into the injured optic nerve to reconnect the eye to the brain.
Next step: Further incorporate stem cells into the eye for vision.

Vision loss in glaucoma and many other eye diseases occur due to the loss of connections between the eye and the brain. Following injury, the cells responsible for making these connections that form the optic nerve are not replaced. Therefore, the consequential vision loss from losing these cells and connections are permanent. Regenerating the optic nerve is necessary to restoring vision. Our work focuses on adapting stem cells to achieve this goal using various approaches.

Stem cells have the potential to become any cell type in the body, including the cells critical for connecting the eye and the brain. One of our strategies is to produce these specialized cells using stem cells in the lab and then directly transplant them into the eye. To achieve this, we have identified the barriers in the eye that prevent lab-produced cells from being successfully transplanted and are developing methods to remove these barriers. Additionally, using genetic tools and high-throughput screening, we will enhance the ability of the transplanted cells to be successfully transplanted into the eye. The goal of this work is to restore vision by directly replacing the cells that are lost in glaucoma and retinal diseases.

In an alternative strategy to replacing cells by direct transplantation into the eye, we are also developing a novel use of stem cells to regenerate the optic nerve. The ability to regenerate the optic nerve would allow for a number of therapies to restore vision, including whole eye transplantation. We have developed methods to successfully transplant stem cells into the injured optic nerve. The optic nerve transplanted stem cells reform connections with the eye and extend connections toward the brain, acting as an "extension cord" for the optic nerve. Ongoing work will evaluate methods to further integrate optic nerve transplanted stem cells with the visual system and eventually achieve the goal of successful whole eye transplantation.

GRANTS

NATALIE A. AFSHARI, MD
Application of RNA-targeting Cas9 to Fuchs Dystrophy. PI: Natalie A. Afshari, MD National Institutes of Health, R01EY029166-01, April 2018 – March 2023

FGF Signaling in Lacrimal Gland Homeostasis, Regeneration and Disease. Co-I: Natalie A. Afshari, MD Scripps Research Institute, National Institutes of Health/National Eye Institute as Prime, R01 EY028983-01, April 2018 – March 2023

Limbal Stem Cell Fate and Corneal Specific Enhancers. Co-I: Natalie A. Afshri, MD National Institutes of Health/National Eye Institute, R01EY025090, April 2018 – March 2023

RADHA AYYAGARI, PhD
Molecular Basis of Hereditary Retinal Degenerations. PI: Radha Ayyagari, PhD NIH/NEI, R01EY021237, June 2016 - May 2021

Identification of the Elusive Genetic Causality of Inherited Retinal Degenerations (IRDs). PI: Radha Ayyagari, PhD Foundation Fighting Blindness, December 2018 - November 2023

Molecular Mechanism Underlying Late-Onset Retinal/Macular Degeneration. PI: Radha Ayyagari, PhD NIH/NEI September 2020 – June 2024

DIRK-UWE G. BARTSCH, PhD
Mechanistic-Based Non-Invasive Assessment of Retinal Damage in HAART Era. PI: Dirk-Uwe Bartsch, PhD RO1 Grant NIH/NEI September 2016 - August 2021

SALLY BAXTER, MD, MSc
Multi-modal Health Information Technology Innovations for Precision Management of Glaucoma. PI: Sally L. Baxter, MD, MSc. National Institutes of Health, DP5 OD029610. September 2020 – August 2025

Racial differences in smoking-related glaucoma progression: Effects on Neural and Vascular Tissue. Co-Investigator: Sally L. Baxter, MD, MSc. University of California Tobacco-Related Disease Research Program. July 2020 – June 2022

Recruitment & Retention Doctoral Diversity (R2D2) Initiative in Informatics. Co-Investigator: Sally L. Baxter, MD, MSc. University of California Office of the President. June 2020 – May 2025

Rapid Response Data for Discoveries: COVID-19 Clinical data Collection to Promote Better Outcomes. Co-I: Sally L. Baxter, MD, MSc. Gordon and Betty Moore Foundation. May 2020 – December 2020

NIH Director's Early Independence Award (EIA)

SHYAMANGA BOROOAH, MD, PhD
Combining the Utility of Human Induced Pluripotent Stem Cell Modeling and CRISPR-Cas9 Gene Editing with Adeno Associated Virus Vector Gene Delivery to Develop and Optimize Novel Gene Editing in Inherited RPE Disease, PI: Shyamanga Borooah, MD, PhD, The Foundation Fighting Blindness CD-GT-0918-0746-SEI September 2018 - August 2023

Identification of the Elusive Genetic Causality of Inherited Retinal Degenerations (IRDs). PI: Shyamanga Borooah, MD, PhD, The Foundation Fighting Blindness EGI-GE-1218-0753-UCSD December 2018 - November 2023

Defining the Role of LAMP2 in Retinopathy Associated with Danon Disease. PI: Shyamanga Borooah, MD, PhD, Knights Templar Eye Foundation, July 2020 - June 2021

Refining scRNAseq Studies in a Model of Inherited Retinal Degeneration. PI: Shyamanga Borooah, MD, PhD, UC San Diego senate funding, July 2020 - June 2021

Investigating Disease Modifying Interventions for Late-Onset Retinal Degeneration. PI: Shyamanga R. Borooah, PhD, The Foundation Fighting Blindness, August 2018 - July 2021

ANDREW S. CAMP, MD
Teleglaucoma: Expanding Teleophthalmology to Monitor Stable Glaucoma Patients. PI: Andrew Camp, MD VA Spark-Seed-Spread Innovation Investment Program, October 2020 - September 2021

DANIEL L. CHAO, MD, PhD
The Role of ELOVL2 in Macular Degeneration. Brightfocus Macular Degeneration Grant. Co-I: Daniel L. Chao, MD, PhD Brightfocus Foundation. September 2020 - September 2022

Down Syndrome, Early Cataracts, Eye Diseases, and Beta-Amyloid Conformers. Co-I: Daniel L. Chao, MD, PhD NEI/NIH NIH R21 Grant R21 EY031277-01. September 2019 - September 2021

Dissecting the Role of ELOVL2 in Drusen Biogenesis and Age Related Macular Degeneration. PI: Daniel L. Chao, MD, PhD Mentored Career Development Award NEI/NIH K08EY030510 September 2019 - September 2023

TODD COLEMAN, PhD
Biosensor and Eyedrop Bottle Technologies for Glaucoma Adherence Monitoring PI: Todd Coleman, PhD NIH/NEI September 2019 - September 2020

JIUN L. DO, MD, PhD
Optic Nerve Relays to Restore Vision. PI: Jiun Do, MD, PhD American Glaucoma Society, Mentoring for Advancement of Physician-Scientist Award, November 2019 – November 2020

Ophthalmology and Visual Sciences Career Development K12 program. PI: Jiun L. Do, MD, PhD, National Institutes of Health, K12 EY024225. April 2015 - March 2020

Restoration of Visual Function Through the Development of Optic Nerve Relays. PI: Jiun L. Do, MD, PhD, UC San Diego Academic Senate, February 2019 - March 2020

NAPOLEONE FERRARA, MD
Novel Long-Acting Inhibitors of Vascular Endothelial Growth Factor (VEGF) for Treatment of Intraocular Vascular Disorders. PI: Napoleone Ferrara, MD, Co-I: Eric Nudleman, MD, PhD. NIH Grant. Major Goals: To identify longer-acting VEGF inhibitors in order to reduce the burden of intravitreal injections in treating intraocular vascular disorders such as wet AMD. R01 EY031345-01 April 2020 - March 2025

Identification of Novel Inhibitors of Ocular Neovascularization. PI: Napoleone Ferrara, MD, Co-I: Eric Nudleman, MD, PhD, R21 NIH/NEI, April 2018 - March 2021

WON-KYU JU, PhD
Mitochondrial Protection in Glaucomatous Optic Neuropathy. PI: Won-Kyu Ju, PhD National Institutes of Health, R01 EY031697. September 2020 – August 2024

Neuroprotective Role of Sirt6 in Glaucoma. PI: Won-Kyu Ju, PhD National Institutes of Health, R01 EY031054. Consortium June 2020 – May 2025

DON O. KIKKAWA, MD
Gene Expression in Nonspecific Orbital Inflammation Disease. Co-I: Don O. Kikkawa, MD NIH/NEI, September 2016 - August 2021

CATHERINE Y. LIU, MD, PhD
Analysis of DNA Mutations and Transcriptional Changes in Lacrimal Gland Pleomorphic Adenomas. PI: Catherine Y. Liu, MD PhD. UC San Diego Academic Senate, RG084154 June 2020 - May 2021

JOHN H. K. LIU, PhD
Biosensor and Eyedrop Bottle Technologies for Glaucoma Adherence Monitoring. Co-I: John H.K. Liu PhD, NIH/NEI 1R41EY030403, September 2019 – September, 2020

SASAN MOGHIMI, MD
Racial Differences in Smoking-Related Glaucoma Progression: Effect on Neural and Vascular Tissue. PI: Sasan Moghimi, MD, Tobacco-Related Disease Research Program, T31IP151 July 2020 – June 2022

ERIC NUDLEMAN, MD, PhD
Role of PDLIM1 in Retinal Vascular Leakage and Proliferation PI: Eric D. Nudleman, MD, PhD NIH/NEI April 2018 – March 2021

NICHOLAS OESCH, PhD
Computing Luminance and Contrast in Prosthetically Driven Retina RO1. PI: Nicholas Oesch, PhD NIH/NEI EY029259 September 2018 - June 2023

JOLENE RUDELL, MD, PhD
The Characterization of the Neuromuscular Junction in Extraocular Muscles in Patients with Strabismus PI: Jolene Rudell, MD, PhD Knights Templar Eye Foundation July 2019 – December 2020

Ophthalmology and Visual Sciences Career Development K12 program. PI: Jolene Rudell, MD, PhD National Institutes of Health, K12 EY024225. April 2015 - March 2020

PETER SHAW, PhD
HTRA1 as a Therapeutic Target in the Treatment of Wet AMD. PI: Peter Shaw, PhD NIH/NEI August 2015 – June 2020

DORAN SPENCER, MD, PhD
Analysis of conjunctivitis as a presenting sign of COVID-19. Seed Funds for Emergent COVID-19 Related Research program.

KARL WAHLIN, PhD
Pluripotent Stem Cell Derived 3D Retinas for Studies of Early Onset Retinal Degeneration. PI: Karl J. Wahlin, PhD. NIH grant. R01EY031318. The goal of this study is to study the impact of AIPL1 mutations in the onset of rod and cone dystrophy in human pluripotent stem cells.

Dissecting the Biochemical Role of Epigenetically Modified Regulatory Sequences within the Genomes of Retinal Neurons. Subcontractor: Karl Wahlin, PhD National Institutes of Health, R15 EY028725. August 2018 - June 2021

Endogenous Generation of Cone Photoreceptors to Increase Light Responses in Foveal Hypoplasia. PI: Karl Wahlin, PhD Vision of Children July 2020 – June 2022

Modeling Photoreceptor Development and Disease with Human Pluripotent Stem Cells. PI: Karl Wahlin, PhD NIH/NEI August 2016 – July 2020

A Stem Cell Based Optic Nerve Model for Studies of Axon Guidance and Regeneration.

PI: Karl Wahlin, PhD NIH/NEI August 2019 – July 2020

An IPSC Cell Based Model of Macular Degeneration for Drug Discovery. PI: Karl Wahlin, PhD CIRM April 2018 – March 2020

Micronenvironment Based Optimization of Retinal Induction Using CRISPR-CAS9 Reporter Pluripotent Stem Cells as an Expandable Source of Retinal Progenitors and Photoreceptors. PI: Karl Wahlin, PhD CIRM October 2016 – September 2020

Complement Factor H Mutant Pluripotent Stem Cells to Model Early Onset Macular Degeneration and Their Application in Drug Discovery. PI: Karl Wahlin, PhD BrightFocus Foundation July 2018 – June 2020

Dissecting the Biochemical Role of Epigenetically Modified Regulatory Sequences within the Genomes of Retinal Neurons (A1) PI: Karl Wahlin, PhD James Madison University; NIH/NEI as Prime September 2018 – May 2021

ROBERT N. WEINREB, MD

Diagnosis and Monitoring of Glaucoma with Optical Coherence Tomography Angiography. PI: Robert N. Weinreb, MD National Institutes of Health, R01 EY029058.

Ophthalmology and Visual Sciences Career Development K12 Program. PI: Robert N. Weinreb, MD National Institutes of Health, K12 EY024225.

Unrestricted and Challenge Grant. PI: Robert N. Weinreb, MD Research to Prevent Blindness

Machine Learning Methods for Detecting Disease-Related Functional and Structural Change in Glaucoma. PI: Robert N. Weinreb, MD National Institutes of Health, R01 EY027945. July 2017 - June 2022

A Randomized, Single Center, Masked, Crossover Study Comparing the Effects of Latanoprostene BUNOD and Timolol on Retinal Blood Vessel Density and visual Acuity in Patients with Ocular Hypertension or Primary Open Angle Glaucoma PI: Robert N. Weinreb, MD Bausch & Lomb September 2018 – August 2021

Ocular Hypertension Treatment Study 20-Year Follow-up: Clinical Center Grant. PI: Robert N. Weinreb, MD, NIH July 2015 – June 2020

DEREK S. WELSBIE, MD, PhD

Kinase Multitargeting for Glaucoma Neuroprotection. RO1 PI: Derek S. Welsbie, MD, PhD, NIH/NEI July 2018 - June 2023

High-Throughput Functional Genomic Screening in Retinal Ganglion Cells. PI: Derek S. Welsbie, MD, PhD, Glaucoma Research Foundation February 2019 - January 2022

T32 Translational Vision Research Training at UCSD, National Eye Institute, T32, April 2016 – March 2021

Novel AAV/CRISPR Therapeutic for DLK Inhibition. PI: Derek Welsbie, MD, PhD, BrightFocus Foundation July 2017 – June 2020

Developing an Optic Nerve Relay for Vision Restoration. PI: Derek Welsbie, MD, PhD Research to Prevent Blindness January 2020 – December 2022

LINDA ZANGWILL, PhD

African Descent and Glaucoma Evaluation Study (ADAGES IV). Co-PI: Linda Zangwill, PhD NIH/NEI R01EY026574 April 2017 - March 2021

Diagnostic Innovations in Glaucoma Study (DIGS): High Myopia and Advanced Diseases. PI: Linda Zangwill, PhD NIH/NEI R01EY027510 February 2017 - January 2022

P30 – Center Core Grant for Vision Research. PI: Linda Zangwill, PhD NIH/NEI P30EY022589-01 July 2012 - June 2023

Translational Vision Research Training at UC San Diego. PI: Linda Zangwill, PhD NIH NEI T32EY026590 April 2016 - March 2021

OCT in the Ocular Hypertension Treatment Study: 20-Year Follow-up. PI: Linda Zangwill, PhD NIH/NEI R21EY031125 December 2019 - November 2021

Dietary Interventions to Improve Vision. Co-PI: Linda Zangwill, PhD Krupp Endowment Fund January 2017 - December 2021

Diagnosis and Monitoring of Glaucoma with Optical Coherence Tomography Angiography. Co-PI: Linda Zangwill, PhD NIH/NEI R01 EY029058 April 2018 - March 2023

Personalized Forecasting of Disease trajectory for Patients with Open Angle Glaucoma Consortium PI: Linda Zangwill, PhD NIH/NEI R01 EY026641 September 2016 - August 2021

The Heidelberg Engineering ANTERION Imaging Agreement Study Reading Center B-2018-4. PI: Linda Zangwill, PhD Heidelberg Engineering B-2018-4 July 2019 - October 2020

NEI Center Core Grant for Vision Research. PI: Linda Zangwill, PhD NIH/NEI September 2018 – June 2023

DONOR PROFILE
IRVING TRAGEN

Distinguished diplomat and Latin American expert Irving Tragen has committed to support the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute (SEI) at UC San Diego now and in the future. In addition to annual gifts as a member of the Circle of Sight, he has made a bequest to SEI from a number of charitable gift annuities that he has created as well as including SEI in his estate plan.

A California native, Irving received both his bachelor's and law degrees from UC Berkeley, along the way meeting his beloved wife, Ele on the campus. Irving and Ele married in 1947 and embarked on the first leg of what would become a life-long journey to improve relations between the US and our Latin American and Caribbean neighbors. For nearly 55 years, Irving served as a US Foreign Service officer and official with the Organization of American States.

After decades of postings in Mexico, El Salvador, Chile, Venezuela, Bolivia, Guatemala, Panama and Washington, DC, with extensive official travel in Latin America, the Caribbean, Europe and Asia, Irving and Ele retired to La Jolla. Within the first 6 months upon arrival, the Tragens were referred to the Shiley Eye Institute at UC San Diego Health by one of their new friends.

"On our first visit 17 years ago, we were impressed by the professionalism of the eye care we received. No other health institution in our experience compared with the terrific team, quality of care and excellent service we received from the doctors and staff at Shiley," stated Irving. "Between the two of us, we found a home for long term eye care. That is why both of us decided to donate regularly to Shiley and include it in our estate plan."

Ele is gone now, but Irving stays active and involved. He has recently completed writing a memoir about his life with Ele and their adventures in the Foreign Service. He also lectures about Latin America at World Affairs Council North County, University of San Diego's Joan Kroc School of Peace and works with UC San Diego's School of Global Policy and Strategy.



Irving and Ele Tragen

A charitable gift annuity (CGA) is a tax-wise way to support the Shiley Eye Institute. A CGA involves a simple contract between you and UC San Diego. You agree to make a gift and, in return, we agree to pay you (and someone else, if you choose) a guaranteed fixed amount each year for the rest of your life. You direct what research area at the Shiley Eye Institute receives the remaining balance of your CGA when the time comes. A CGA provides dependable income in your retirement years and you can qualify for a variety of tax benefits, including a charitable tax deduction when you itemize.

EVERY GIFT HAS IMPACT

For over 30 years, the philanthropic support from generous individuals, foundations and corporations has provided the Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego with valuable resources for patient care, research, education and community service.

The state of California provides less than 2% of our budget and therefore, we must rely on private gifts. As a friend of the Viterbi Family Department of Ophthalmology, there are several giving options for those who wish to contribute to our tradition of excellence.

IN 2020, DEDUCT UP TO 100% OF YOUR AGI FOR CASH GIFTS

For 2020 only, you may elect to waive the adjusted gross income (AGI) limit on qualified cash gifts to the Shiley Eye Institute - creating, in effect, a new 100% of AGI limit for these gifts. The 100% limit is reduced dollar-for-dollar by other itemized charitable deductions.

For example, if in 2020 you deduct 30% of your AGI in long term appreciated property gifts and elect the 100% of AGI limit for qualified cash contributions, you will also be able to deduct up to 70% of your AGI for qualified cash gifts, a total deduction of up to 100% of AGI.

If you make the 100% of AGI election, you can carry forward unused qualified cash gift deductions up to five years. For questions about this opportunity to support Shiley Eye Institute, please contact **Karen Anisko Ryan** at **858-534-8017** or **kanisko@health.ucsd.edu**

QUALIFIED CHARITABLE DISTRIBUTION

A Qualified Charitable Distribution from Your IRA is a Great Way to Support Shiley Eye Institute in 2020.

Did you know that required minimum distributions (RMDs) from retirement accounts have been waived in 2020? Qualified charitable distributions (QCDs) from IRAs are allowed and remain a strategic way to make a tax-free gift to Shiley Eye Institute.

A QCD is not included in your reportable taxable income and since your 2021 RMD will be calculated based in part on the value of your IRA at the end of the year, a QCD in 2020 can help you manage your financial picture in 2021. Furthermore, while a QCD cannot be used in situations where a charitable contribution is only partially deductible, a QCD can be used to satisfy a pledge.

There are two easy steps to make a QCD to Shiley Eye Institute:

1) Notify your IRA administrator of the amount you wish to contribute; and
2) let us know of your plans.

Contact **Karen Anisko Ryan** at **858-534-8017** or **kanisko@health.ucsd.edu** to facilitate a gift letter template and distribution instructions for your IRA administrator, and with any questions about QCDs.

PLEASE NOTE: If you have an "IRA checkbook" issued by your administrator, be sure that we have your check by December 10, 2020 so that we can process your gift prior to the end of the calendar year.

GIVING OPPORTUNITIE$

Outright Gifts – *Immediate Impact*

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

If writing a check, please make payable to the "UC San Diego Foundation" and put the Shiley Eye Institute in the memo section. The check should be accompanied with a letter stating the focus of your donation and mailed to:

The Shiley Eye Institute, Mail code 0946,
9415 Campus Point Drive, Room 241B,
La Jolla, CA, 92093-0946
(Attention: Karen Anisko Ryan)

Annual Gifts – *Circle of Sight*

Started in 1996, the Circle of Sight is the Shiley Eye Institute'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 Institute'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 Institute 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 estate plan that will benefit the future of the Shiley Eye Institute and the Viterbi Family Department of Ophthalmology.

We would be pleased to provide you, your attorney, accountant or tax advisor with specific bequest language for inclusion in your will, trust or as a beneficiary of your retirement account – all of which can lessen the impact of taxes on your heirs or give you comfort of knowing that your assets will benefit those you leave behind.

Tribute Gifts – *Acknowledge Someone Special*

Contributions can be made in memory, honor or in 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.

Gifts of Real Estate

Making a gift of real estate is a generous and financially advantageous way to support Shiley Eye Institute. Many people have residential rental units or vacation homes that no longer serve their needs or have become too burdensome to maintain. Even commercial property and vacant land can be used as gifts to support Shiley's programs.

Real estate can be given as an outright gift or in a bargain sale; it can be used to create a retained life estate, a charitable gift annuity or a charitable remainder trust. There are many creative ways that your real estate can unlock financial security and provide tax benefits for you now while supporting Shiley Eye Institute and the programs that mean the most to you.

VISIONARY CIRCLE

Members of the Visionary Circle are cumulative lifetime contributors of one million dollars or more to the Shiley Eye Institute and the Viterbi Family Department of Ophthalmology. We appreciate their generosity.

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Frances Hamilton White

**Deceased*

THE HONOR ROLL FOR THE VITERBI FAMILY DEPARTMENT OF OPHTHALMOLOGY AND SHILEY EYE INSTITUTE AT UC SAN DIEGO GRATEFULLY ACKNOWLEDGES DONATIONS FROM JULY 1, 2019 THROUGH JUNE 30, 2020. THANK YOU TO ALL OF THE INDIVIDUALS, FOUNDATIONS AND CORPORATIONS LISTED BELOW.

Gifts of $100,000 and Above

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Tricia Shiley
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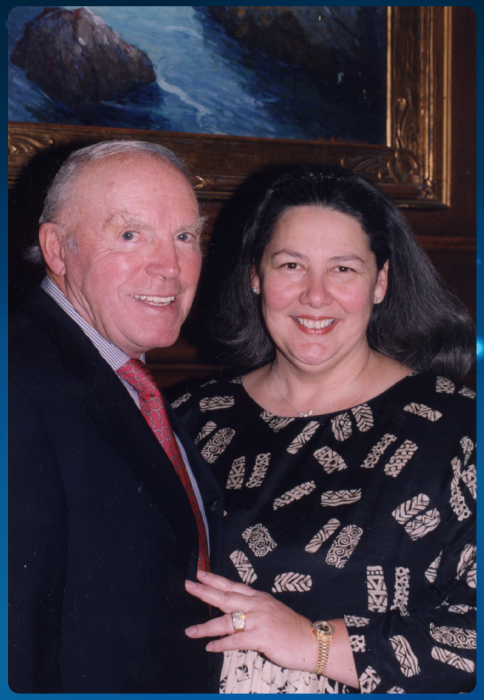
* Deceased

MEMORIALS

The Viterbi Family Department of Ophthalmology and the Shiley Eye Institute at UC San Diego sadly acknowledges friends and key supporters who have passed away during the past year. They remain in our thoughts.

James Boily
Blaine Briggs
Faiya Rose Fredman
Maureen Iliff Fritzer
Sook Hansen
Leonard E. Hart
Rosemarie Kalemkiarian
Tatiana A. Lansche
Theodore & Anabel Mintz
Edwina Louise Schatz
Donald D. Stone
Margery Strayve
Josephine Zolin

Remembering Donald P. Shiley



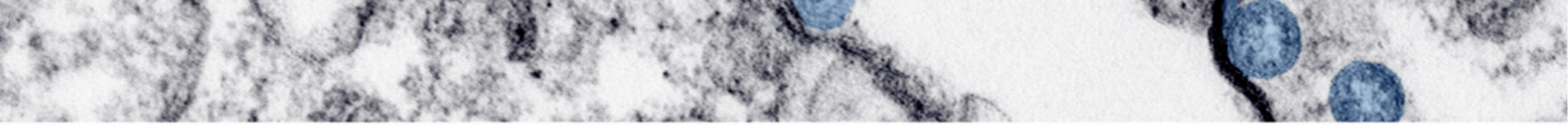


2020 marks a milestone year remembering our benefactor Donald Pearce Shiley – engineer, inventor, entrepreneur and philanthropist. On January 19, 2020, Mr. Shiley would have been 100 years old and on July 31, 2020 it has been 10 years since his passing.

In 1990, he and his wife Darlene generously donated the funds to create a comprehensive eye care facility where top ophthalmologists would treat patients, conduct research and train the next generation of leaders in eye care and vision research. The Darlene V. and Donald P. Shiley Eye Institute will be 30 years old in 2021.

"Donald Shiley's legacy of giving hope to countless visually challenged individuals and helping to improve their quality of life will long be remembered by our patients, faculty and staff", stated **Robert N. Weinreb, MD**, Chair of the Viterbi Family Department of Ophthalmology and Director of the Shiley Eye Institute at UC San Diego.

"His wish to house a world class eye center in San Diego demonstrated his vision for the future. The impact of the Shileys on Ophthalmology has been far reaching."



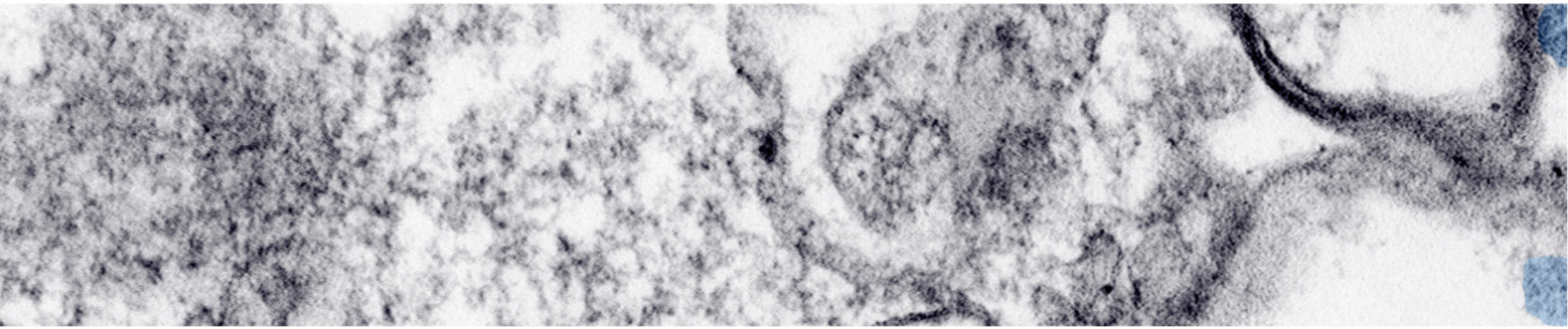
Shiley Eye Institute

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