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Message from the Chair

It is with immense gratitude that I announce a transformational gift to name and endow the USC Gayle and Edward Roski Eye Institute. This generous $25 million gift from USC Trustees Gayle and Edward Roski will support the institute's initiatives to preserve, restore and improve the sight of patients in Southern California and worldwide.

As USC alumni, Gayle and Edward Roski have given back to USC for more than 40 years. The Roski's gift will propel us to the forefront of discovery in vision research, education and patient care. These funds will help establish a surgical training laboratory for teaching the most advanced techniques to the next generation of eye surgeons, providing new knowledge and furthering the education of tomorrow's leaders in ophthalmology. As we continue to grow and expand, we focus our efforts on transformative recruitments, who bring a unique brand of skills, expertise and leadership that will enhance patient care and advance our vision science initiatives.

In this edition of Up Close we reflect on the USC Roski Eye Institute's achievements, which include understanding the origins of retinoblastoma, insight into the burden of eye diseases among minorities and our education outreach programs. As we move into the second half of 2016, we are extremely grateful for this visionary gift that will empower us to make an indelible impact on the lives of the visually impaired.

Rohit Varma, MD, MPH
Director, USC Roski Eye Institute

In May, Mark Humayun, MD, PhD traveled to the White House to receive the National Medal of Technology and Innovation. “He says the moment when he witnessed someone seeing light and shapes, someone experiencing sight for the first time in decades, have been some of the happiest and most rewarding of his professional career,” says President Obama when speaking about Humayun during the medal ceremony at the White House, May 18, 2016.
Visionary Gift

VISIONARY GIFT NAMES THE USC GAYLE AND EDWARD ROSKI EYE INSTITUTE

“Visionary gift names the UsC gayle and edward roski eye institute.

“Gayle and Ed Roski’s gift is an incredible vote of confidence in the work we do at the USC Roski Eye Institute. Their support of USC has been unwavering over the decades and I am humbled that they chose to invest in our faculty and our work. This gift will enable us to advance eye research in fields such as ocular imaging, drug delivery, dry eye, stem cell therapies and public health policy.” — Rohit Varma, director of the USC Roski Eye Institute.

Gayle and Ed Roski with USC President C.L. Max Nikias

“Both see philanthropy as meaning precisely what its Greek roots say: love of humanity. The Roskis have left little doubt of that in their bold civic leadership. And their dedication to USC is as exceptional as their generosity.” — C. L. Max Nikias, USC President

L to R: Senior Vice President and CEO of Keck Medicine of USC Thomas E. Jackiewicz, Ed and Gayle Roski, LA County Supervisor Mark Ridley-Thomas, USC President C.L. Max Nikias

“Sight is so profoundly important, and we feel fortunate to be in a place where we can help bring the institute to the next level.” — Ed Roski
USC Roski Eye Institute ophthalmologists were recognized among the World’s 100 Most Influential People in Ophthalmology by The Ophthalmologist. Congratulations to our three ophthalmologists included on this prestigious list for their advances in ophthalmology: Mark S. Humayun, MD, PhD, Carmen Puliafito, MD, MBA, and Farhad Hafezi, MD, PhD.

**4TH ANNUAL VITRECTOMY BUCKLE SOCIETY MEETING**
The retina service of the USC Roski Eye Institute had a strong presence at the 4th Annual Vitrectomy Buckle Society (VBS) meeting, with Andrew Moshfeghi, MD, MBA, playing an integral part of the executive committee, Damien Rodger, MD, PhD and Lisa Olmos de Koo, MD, MBA, attending with invited talks, and fellows Meena George, MD, Jeffrey Tan, MD, and Hassan Aziz, MD winning travel grants to attend the meeting based on their surgical video submissions. The institute had several award winners at this year’s meeting: Tan won the Best Fellow Surgery award and Best Video Presentation, Olmos de Koo won the Best Female Surgery award and Rodger received runner up for Best Male Surgery award.

**COBRINIK RECEIVES SECOND ROI GRANT**
Congratulations to David Cobrinik, MD, PhD, USC Roski Eye Institute researcher, who received a second ROI grant from the National Eye Institute, a part of the National Institutes of Health. Cobrinik received the grant for his work entitled “Human Specific Signaling Circuitry in Cone Precursor Development.” This research aims to model human retinal disease and help design future human stem cell-derived cone cell therapies.

**FOSTERING INNOVATIVE RETINA STARS OF TOMORROW**
Congratulations to Damien Rodger, MD, PhD, assistant professor of clinical ophthalmology and research, assistant professor of biomedical engineering, for being selected as an inaugural member of Allergan’s inaugural FIRST (Fostering Innovative Retina Stars of Tomorrow) mentorship program.

**JIANG RECEIVES GRANT FROM THE USC ZUMBERGE FUND**
Congratulations to Xuejuan Jiang, PhD, assistant professor of research ophthalmology and preventive medicine, who was awarded a grant from the USC Zumberge Fund Individual Grant Program for her research related to the project “Helicobacter Pylori Infection and Primary Open-angle Glaucoma among Mexican Americans: an Example of Microbiota-Gut-Brain Axis.”

**THOMAS RECEIVES FUNDING FROM BRIGHTFOCUS FOUNDATION**
We are pleased to announce that Biju B. Thomas, PhD, assistant professor of research, recently received funding from BrightFocus Foundation for his studies in macular degeneration. Thomas is conducting an in-depth analysis of a novel approach to transplant human induced pluripotent stem cell-derived retinal pigment epithelial (iPS-RPE) for the treatment of age-related macular degeneration (AMD).

**DR. LAM INDUCTED TO ARCADIA CHAMBER OF COMMERCE**
L to R: Chui Chow, Sylvia Rea, California Senator Bob Huff, Mei Mei Ho, Linda Lam, J. Martin Heur and Dara West
David Cobrinik, MD, PhD, USC Roski Eye Institute associate professor of research ophthalmology, received an NIH RO1 grant in March. The grant will aid in continuing his research on the origin of retinoblastomas.

About Retinoblastoma
Most common ocular tumor in children, with an incidence of ~ 1/17,000.

Research Breakthroughs by the Cobrinik Team
- First identified the retinoblastoma cell of origin in 2014, published in *Nature*.
- Discovered that only immature light-sensing cells proliferate and form retinoblastoma-like tumors.

Using non-invasive imaging methods to understand retinal development and retinoblastoma tumorigenesis
- Former USC Roski Eye resident Andrew Browne, MD, PhD, under Cobrinik’s mentorship, with collaborations at Children’s Hospital Los Angeles (CHLA) and the USC Viterbi School of Engineering, performed a live imaging analysis of stem cell-derived retinal tissue (Figure 1).
- Human stem cell-derived retina model system established by CHLA researcher Jennifer Aparicio, PhD, and USC Roski Eye Associate Professor and The Vision Center at CHLA Director Thomas Lee, MD.
- Imaging techniques included spectral domain optical (HSpec) and fluorescence-lifetime imaging (FLIM) to detect metabolic activity as well as structural features that resemble the normal developing retina.
- Imaging may enable for a greater understanding of retinal disease mechanisms and may help monitor the production of cells for retinal regeneration treatments.

“*In our lab we have focused our efforts on understanding the behavior of the cells that give rise to retinoblastomas so we can design novel approaches to prevent these tumors in predisposed children.*”

— David Cobrinik, MD, PhD

Figure 1: Multi-modal imaging of live stem cell-derived retinal tissue
In the largest epidemiological studies conducted in the nation, on Chinese Americans and Latinos, USC Roski Eye Institute Director Rohit Varma, MD, MPH and his team continue to uncover the prevalence of eye diseases and identify key risk factors among minorities and vulnerable populations.

**CHES and LALES funded by the National Eye Institute. Preliminary findings of the studies appear in the April 2016 issue of JAMA Ophthalmology.**
USC ROSKI EYE INSTITUTE’S GRAND OPENING OF THE OPHTHALMIC PATHOLOGY LABORATORY

The USC Roski Eye Institute recently opened Ophthalmic Pathology Laboratory, under the direction of Narsing Rao, MD, USC professor of ophthalmology and director of the uveitis and ocular inflammation service. Rao is a world-renowned pathologist with over 35 years of expertise in eye tumors. He is also a clinician, researcher, educator and author of the Armed Forces Institute of Pathology (AFIP) Atlas of Tumor Pathology Series 4.

The Eye Pathology Laboratory is dedicated to the histopathologic diagnosis of ocular non-neoplastic and neoplastic conditions, including intraocular lymphoma. Through an interdisciplinary approach, our ocular oncologists work alongside the pathologists to determine a personalized course of treatment. Our primary objective is to ensure that patients have access to the most leading-edge diagnostic techniques that may result in early diagnosis and optimal prognosis. Our world-class experts strive to improve patient care by participating in clinical trials and by continuing to develop novel diagnostic tools.
NEW FACULTY RECRUITS IN MULTIPLE SUBSPECIALTIES

The newest USC Roski Eye Institute faculty members are from some of the finest institutions across the country. Our ophthalmologists provide their expertise to patients in need of specialized care and cutting-edge interdisciplinary research. We welcome faculty in multiple subspecialty areas, including cornea and external diseases, glaucoma and biomedical engineering.

J. BRADLEY RANDLEMAN, MD
Professor of Ophthalmology, Director of Cornea Service, External Disease and Refractive Surgery

J. Bradley Randleman, MD, is professor of ophthalmology in cornea, external disease and refractive surgery service, where he will serve as the service’s director. Prior to coming to USC Roski Eye Institute, Randleman was professor of ophthalmology and director of his service at Emory Eye Center. A widely respected cornea specialist, Randleman has served as editor-in-chief for the Journal of Refractive Surgery since 2011. He has received numerous awards and authored more than 120 peer-reviewed publications in ophthalmology journals, 30 book chapters & three textbooks.

SAHAR BEDROOD, MD, PHD
Assistant Professor of Clinical Ophthalmology

Sahar Bedrood, MD, PhD, joins the USC Roski Eye Institute glaucoma faculty in July, after completing her fellowship at the Wilmer Eye Institute at Johns Hopkins School of Medicine. A USC alumna, Bedrood completed a combined MD/PhD program at Keck School of Medicine of USC after earning her undergraduate degree in biochemistry and chemistry at UCLA. Her research interests include studying the structural characteristics of the lamina cribrosa and its role in glaucoma progression. She received the Remarkable Women of USC award and the 2015 Society of Heed Fellows Fellowship Award.

QIFA ZHOU, PHD
Visiting Professor of Ophthalmology

Qifa Zhou, PhD, is an accomplished researcher with more than 179 papers and 10 awarded patents. Zhou is widely respected as an innovator in the field of bioengineering with expertise in the areas of ultrasound and imaging technology with an emphasis on ocular disease. He recently patented an integrated ultrasound and optical coherence tomography (OCT) for diagnostic applications. Zhou has multiple grants exceeding $10 million in funding as principal investigator. In 2014, Zhou was appointed fellow of both International Society for Optics and Photonics and American Institute for Medical and Biological Engineering.

USC ROSKI EYE INSTITUTE AT ARVO 2016

USC Gayle and Edward Roski Eye Institute experts shared their latest breakthroughs at this year’s ARVO.
The Ophthalmic Technician Education Program (OTEP), led by Joseph D. Cocozza, PhD, assistant professor of research in ophthalmology, will leverage the world-class resources and human capital of the USC Roski Eye Institute to help fulfill the need for highly skilled and compassionate eye care providers.

About USC Roski Eye Institute’s OTEP

What is OTEP?

OTEP is a 21-month training program for individuals interested in an allied health career in the field of ophthalmology. The mission of OTEP at the USC Roski Eye Institute is to prepare ophthalmic medical personnel (OMP) to assist ophthalmologists in the prevention, detection and treatment of vision impairments.

How Many Programs Are on the West Coast?

The USC Roski Eye Institute’s OTEP is the only program in California, one of only two programs on the West Coast and one of only 14 programs nationally.

What is unique about OTEP?

OTEP is a certificate program in the allied health field. It is the first such program offered by Keck Medicine of USC. It is an entry to a professional career in the healthcare field for individuals across the age-spectrum, enabling them to impact the quality of life of countless individuals who have vision disorders.

How Much Hands-On Training Do Trainees Receive?

OTEP students take a series of 19 courses ranging from medical ethics to surgical assisting. In addition to the didactic courses, OTEP students rotate through clinics where they receive more than 1,000 hours of real-world, hands-on, patient-centered experience under the supervision of ophthalmologists, residents and ophthalmic technicians.

What Can Clinicians Expect from Graduates?

Graduates of OTEP must take the Joint Commission on Allied Health Personnel in Ophthalmology exam. This exam includes skills testing in six specialty areas including: lensometry, visual fields, ocular motility, keratometry, retinoscopy, refinement and tonometry. Passing this national exam leads to certification as an ophthalmic technician.

Is There an Outreach Initiative?

As part of their OTEP training, students will participate in outreach activities in the local communities and be involved in vision screening and eye health education.

For more information please visit: https://eye.keckmedicine.org/otep/
In May, USC Roski Eye Institute retina specialists Andrew Moshfeghi, MD, MBA, Linda Lam, MD, MBA, and Hossein Ameri, MD, PhD, participated in an event at the Los Angeles Braille Institute. Our ophthalmologists presented to almost 200 Braille students and community members who gained an understanding of blinding eye diseases such as age-related macular degeneration, retinitis pigmentosa as well as retinal detachments. The presenters also shared treatment options & clinical trials available at the USC Roski Eye institute in addition to the latest research breakthroughs. Those who could not attend were able to watch through live streaming of the event on social media.

It was an honor to have USC patient Terry Byland, the world’s first person with the Argus retinal prosthesis system in both eyes, speak at the event. All who attended found his story tremendously powerful and moving.

“Terry is more than a patient, he is a part of our research team,” says Mark Humayun, MD, PhD, co-inventor of the Argus device, co-director, USC Roski Eye Institute.

“It is a blessing to be a part of this,” says Terry Byland when speaking about his contributions to the USC Roski Eye Institute research efforts.

“It is a miracle for me to be able to have this device. I can see the difference between dark and light,” says Byland when describing what it was like to use the retinal implant.

“The next frontier for the USC Roski Eye Institute will be to bring color in some form to these devices. This can only be done in a place like USC because of the collaborations between our physicians and engineers.”

— Rohit Varma, MD, MPH
Director, USC Roski Eye Institute

Patient Terry Byland speaks to audience members about the Argus device he uses and the impact it has had on his vision and his life.
LOS ANGELES TIMES FESTIVAL OF BOOKS

The Los Angeles Times Festival of Books started in 1996 with a simple goal: to bring together the people who create books with the people who love to read them. The festival was an immediate success and has evolved to include live bands, poetry readings, chef demos, cultural entertainment and artists creating their work on-site. The two-day celebration of music, comedy, photography, film, art, food and books is held on the campus of University of Southern California, which is a major sponsor. The Keck Medical Center occupied multiple booths and offered free health, dental and vision screenings. Volunteers from the USC Roski Eye Institute screened 250 patients during the event.

HEALTH FAIR IN HAZARD PARK

At the USC Health Fair, faculty members, staff and volunteers provided free health screenings, healthy snacks and demonstrations on the use of the new exercise equipment in Hazard Park, located directly across from the USC Health Sciences Campus. The USC Roski Eye Institute, USC School of Pharmacy, USC School of Physical Therapy, and global health and asthma awareness groups participated in the screenings. The aim was to benefit people in the community through health screenings & education about health initiatives. The event was immediately after an Easter egg hunt at Hazard Park, resulting in many people attending the fair and the screening of approximately 80 people.

VISION SCREENINGS AT ANNUAL PANCAKE BREAKFAST

USC Roski Eye Institute partnered with the Arcadia Host Lions Club branch to provide free vision screenings at the Arcadia Firefighter Association’s Annual Pancake Breakfast, May 7, 2016. Both the USC Roski Eye Institute and Lions Club vans were on location to provide screenings. The Lions Club treated our volunteers to a delicious breakfast cooked by the Arcadia firefighters. The fire department is located on the northeast corner of Huntington Drive and Baldwin at the edge of the Westfield Santa Anita Mall.