### UCI Health Gavin Herbert Eye Institute

# SHINE the LIGHT

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SPRING 2020

### **RESEARCH UPDATE**

### Speeding discovery through translational research

Science has taken the work of understanding vision problems along promising new avenues. But the ultimate goal isn't the discoveries made, as exciting as they are. It's to bring those discoveries to patients as efficiently as possible. In turn, the patients' experiences with new medications and treatments can help researchers refine or explore other treatments altogether.

That's why the Gavin Herbert Eye Institute (GHEI) recently opened its Center for Translational Vision Research, using multidisciplinary teams working together, including basic researchers, biomedical engineers, pharmacologists, clinical doctors and even experts on navigating clinical-trial approvals.

### A new model

The translational approach replaces the old model in which lab researchers worked in silos, separate from clinicians and other experts. The translational model calls for a bench-to-bedside method in which both clinicians and scientists labor to move innovations to patients.

"Having large groups of different specialists means that each person's different area of expertise can inform the others in ways that makes each discovery more relevant," said Dr. Andrew Browne, a GHEI ophthalmologist and biomedical engineer who is steeped in translational methods.



Michael Cahalan, PhD, Baruch D. Kuppermann, MD, PhD, Kryzysztof Palczewski, PhD, and Michael J. Stamos, MD, right to left

"A basic scientist might make a useful discovery that is practical and works in laboratory animals but impractical to offer to human patients," he said. "Communication between basic and clinical scientists ensures efficiency to deliver relevant discoveries from the laboratory to patients."

### New team brings expertise

The Center for Translational Vision Research took a big step toward reality with the arrival in September 2018 of Krzysztof Palczewski, PhD. The internationally renowned chemist, pharmacologist and vision scientist has made critical contributions to understanding the molecular basis of age-related macular degeneration and inherited retinal degeneration.

He brought with him a team of multidisciplinary vision experts.

The work of Palczewski's team includes examining whether FDA-approved medications used for a variety of diseases also may be effective treatments for retinitis pigmentosa.

Because FDA-approved drugs already have been found safe for patients, scientists can skip Phase 1 trials and go directly to Phase 2 trials to study their value in treating disease. That alone could bring promising new treatments to patients faster.

### Patients, the ultimate beneficiaries

"The connection between scientists and physicians is the key to translating scientific work to patient treatments," Palczewski said.

"Physicians see the patients suffering from disease. They're very attuned to the things that are happening to the patients and how they're responding. The scientists often use surrogate methods, such as animal experiments. Those are two different worlds."

The center is actively developing new devices for imaging and testing eye sensitivity. Testing people with cataracts, for example, is difficult because a cataract won't let most light enter the eye. The new devices can stimulate vision by using infrared light which better penetrates the cataract. Working together ultimately benefits patients, Browne said.

"Translational research provides an opportunity to improve peoples' lives," he said. "The culture surrounding a translational team means that things are done more efficiently by sharing information and developing ideas with groups of specialists."

### **MESSAGE FROM THE CHAIR**

Could there be a more symbolic year than 2020 for making expansive plans in vision research and treatment?

With Gavin Herbert Eye Institute (GHEI) now seven years old, we are entering our first full decade of operation, and I'm excited that we have a clear vision of the remarkable work ahead of us.

In this newsletter, you'll learn more about our recently opened Center for Translational Vision Research and why translational research is so important for bringing new discoveries to our patients and using their experiences to inform our future research. We have enlisted an extraordinary team for this, one that is helmed by renowned vision researcher Krzysztof Palczewski, PhD. You'll also learn about a major honor recently bestowed on Palczewski.

We've also added another top researcher to the center's team. Dorota Skowronska-Krawczyk, PhD, comes to us from UC San Diego. As a molecular biologist, her research has been focused on using molecular and cellular approaches to decipher the mechanisms underlying retina biology. The university's leaders have been so excited about the work being done at this new center that they have approved additional funding to allow us to hire yet another top-line researcher.

Other GHEI faculty members have been making important progress on their research and finding grant money to move it forward. That includes an additional \$8 million from the California Institute for Regenerative Medicine for the extremely promising work led by Drs. Henry Klassen and Jing Yang on the use of human progenitor retinal cells to treat retinitis pigmentosa. Their latest work is focused on better manufacturing of those stem cells and re-injecting clinical trial participants who were previously injected to determine the procedure's safety.

In the coming years, we will buildout our second floor, which eventually will include clinic space, eight procedure rooms and a space for oculoplastics. We also will add three more operating rooms on the ground floor. Both projects are expected to start later this year.

Look for us to be making new clinical hires in the fields of cornea treatment, glaucoma treatment, neuroophthalmology and ocular oncology. And we'll be expanding our residency program from nine residents to 12, including one stationed at CHOC Children's in Orange.

We are on the brink of so many extraordinary new ventures. Our aim is to bring 20/20 vision, or as close to it as possible, to many more people in the year 2020 and beyond.

Kauch leithunan

Baruch D. Kuppermann, MD, PhD Director, Gavin Herbert Eye Institute Chair, Department of Ophthalmology

### Faculty members

### Cataracts, Cornea, External Disease and Refractive Surgery

Marjan Farid, MD Vice Chair, Ophthalmology Faculty Sumit (Sam) Garg, MD Vice Chair, Clinical Ophthalmology Sanjay Kedhar, MD Matthew Wade, MD

#### **Cataracts and Glaucoma** Ken Y. Lin, MD, PhD Sameh Mosaed, MD

**Comprehensive Ophthalmology** Maria Estiponal, MD Kavita K. Rao, MD

#### Low Vision

Rebecca L. Kammer, OD, PhD

**Neuro-ophthalmology** Lilangi Ediriwickrema, MD Robert Wade Crow, MD

**Oculoplastics** Lilangi Ediriwickrema, MD Jeremiah Tao, MD

#### **Ophthalmic Pathology** Maria Estiponal, MD Donald S. Minckler, MD

Optometry

### Joseph Bui, OD

Timothy Scott Liegler, OD Kailey A. Marshall, OD Linda Shi, OD Justin Wong, OD

#### **Pediatric Ophthalmology**

Charlotte Gore, MD Robert W. Lingua, MD Mohammad Riazi, MD Jennifer L. Simpson, MD

### **Retina and Vitreous**

Andrew Browne, MD, PhD Baruch D. Kuppermann, MD, PhD *Chair, Department of Ophthalmology* Stephanie Y. Lu, MD Mitul C. Mehta, MD Mohammad Riazi, MD

#### Research

Andrew Browne, MD, PhD Lbachir Benmohamed, PhD James V. Jester, PhD Tibor Juhasz, PhD M. Cristina Kenney, MD, PhD Timothy Kern, PhD Henry J. Klassen, MD, PhD Philip Kiser, PhD Baruch D. Kuppermann, MD, PhD Anthony B. Nesburn, MD *Vice Chair, Research* Krzysztof Palczewski, PhD Eric Pearlman, PhD Magdalene Seiler, PhD Dorota Skowronska-Krawczyk, PhD Jing Yang, MD, PhD

#### Uveitis

Sanjay Kedhar, MD

UCI Health Gavin Herbert Eye Institute

### Q & A with a celebrated vision scientist

Preeminent vision researcher Krzysztof Palczewski, PhD, who started the UCI School of Medicine's Center for Transitional Vision Research, has received one of the greatest honors that can be awarded to leaders in our field: election to the National Academy of Medicine.

The National Academy of Medicine recognizes leaders in diverse fields and provides independent, objective analysis on health and medical issues.

Shine the Light talked with Palczewski about the election and his research.

### Q. Congratulations! Did you have any idea this major honor might be coming your way?

A. I had no idea. The process is highly regimented and democratic, as well as confidential. Now that I'm a member and I look at the guidance about selecting new members, what's clear is that it's not the kind of thing you apply for or ask a colleague to help you with. There's a whole internal process. The first time I learned that I was even being considered was when I got the email telling me that I had been elected.

## Q: In practical terms, what will this honor mean to your work?

A. This is a very pure honor without a monetary award. It's truly a recognition that over the course of a decade or more, a scientist has conducted important and high-level research in a thoroughly ethical, responsible way. What it will do, as I'm seeing already, is make me a part of discussions by great scientific minds in our country about the most important issues affecting people's health, such as newly emerging diseases.

### Q: Elected members work as volunteers for the academy to help examine medical and health issues. What form do you see your work for the organization taking?

A: Blinding diseases are second only to cancer as people's greatest health fear. But we have made great progress on these. Consider that glaucoma is now a manageable

disease! I would like to focus on eye-related diseases so that this progress continues, especially given such visionrobbing conditions as age-related macular degeneration and diabetic retinopathy.

I am also interested in examining the philosophical issue of the role of science in society. There have been waves of interest in science, when it becomes very important to people, and waves when it lacks importance to people. In the United States, science doesn't hold as high a position as in European countries, and I would like to see what can be done to elevate it.

### Q: Now that you have had a chance to settle in and start the work of the Center for Transitional Vision Research, what are your observations about being at GHEI?

A: The overwhelming aspect is the collegiality among people. It is so striking, it's what you notice above anything else. The support in spirit comes down from the leadership and spreads across the staff. We had a meeting to celebrate this honor, and the clear happiness among everyone gathered made the point: This isn't about one person.

### Q: What project excites you most right now?

A: Two things. First, understanding the biochemistry of vision. There are processes that happen in the eye, the image that focuses on the retina and then travels to the brain, that are more complex than the most sophisticated airplane. Understanding how this process works is what will bring us to vision-saving discoveries.

There also has been great progress in imaging. These new imaging techniques are so complex and wonderful in providing information to help diagnose and make a decision about treatment. If you can find out about a condition earlier, you can treat it much earlier, in a preventive way.

### **SPECIAL FEATURE**

### Reconstruction specialist joins GHEI



Dr. Lilangi Ediriwickrema

Most discussions about ophthalmology center on issues affecting the cornea or retina. But Dr. Lilangi Ediriwickrema's area of expertise focuses on different eye problems: disease and pathology that affect the orbital region, eyelids and face, as well as the tear drainage system.

Ediriwickrema, who joined Gavin Herbert Eye Institute (GHEI) in September, is a specialist in reconstructive and cosmetic ophthalmic surgery. She has completed fellowships in both oculoplastic surgery and in neuro-ophthalmology, a specialty that involves the intersection of the eye and brain. The latter, she said, often helps inform the reconstructive work she does.

"For example," she said, "difficulties with eye movement and vision can localize to problems that exist in the orbit, the region between the eye and brain. As a diagnostic neuro-ophthalmologist, I can help identify these diseases. As an oculoplastic surgeon, I can biopsy and help manage affected areas, whether they are due to tumors, infections or inflammation."

In addition to tumors and their removal, which could weaken eyelid muscles or require reconstruction of part of the orbital structure, Ediriwickrema works with patients suffering from infections and inflammatory disorders such as vasculitis and multiple sclerosis. She also corrects droopy eyelids, eyelid bags and drooping brows, and performs tear-duct surgery to allow blocked tears to drain. She has expertise in cosmetic surgery and facial rejuvenation as well, treating wrinkles and volume loss in the aging face, and offering contouring options such as Botox and filler injections.

Her field sometimes requires coordinated care with specialists in other fields. When a patient has a disease that involves the sinus and eye area, Ediriwickrema said she may work with an ear-nose-and-throat specialist to surgically manage the patient.

One recent case involved a squamous cell carcinoma of the earlobe that had spread to the facial nerve, which controls muscle movement. "You have to remove the neural involvement," Ediriwickrema said. "That takes a whole team of surgeons."

Removing the tumor led to weakness in the patient's eyelid so that he was unable to close his eye completely, a problematic situation that causes the eye to dry out and the cornea to thin.

Ediriwickrema temporarily closed the eyelid to protect the eye. Then, when the patient was stable, she performed a cheek lift, tightened the corner of the eyelid to strengthen it, and used an upper-eyelid weight to help the upper lid close.

The collegial atmosphere at GHEI has been especially important to Ediriwickrema, given how important she considers offering effective multidisciplinary care to her patients. She credits the institute's director, Dr. Baruch Kuppermann, the Roger Steinert Professor and chair of the UCI School of Medicine's Department of Ophthalmology.

"Dr. Kuppermann is incredibly supportive and a huge advocate for each of us," she said. "It's been a privilege to join the department under his leadership."

### **DONOR PROFILE**



### Preserving a painter's sight

Ernie Romo was preparing his painter's palette one fall evening in 2017 when he began seeing occasional flashing lights before his eyes. A visit to his UCI Health primary care physician was scheduled for the next day, so the Mission Viejo man figured he'd have it checked soon enough.

Things were much worse the next morning.

"I experienced black lines throughout my right eye," the hobbyist oil painter said. "I rubbed my eye thinking I just needed to fully wake up. One of the scariest moments was wiping my eye and realizing that it was not going to go away."

### A diabetes link

It didn't occur to Romo to connect this with his type 1 diabetes, which he'd had been diagnosed with at age 18. "I was really hard on myself, thinking this was self-induced," the 39-year-old restaurant executive, said. "I thought it was my work with art supplies, maybe the solvent or another toxic chemical." His doctor was immediately concerned — by then Romo couldn't see at all out of the right eye — and got him in right away at the UCI Health Gavin Herbert Eye Institute (GHEI).

It was a deeply upsetting experience for Romo, but one that was eased by the imaging technicians, nurses and other healthcare staff led by retina specialist Dr. Mitul Mehta.

The diagnosis: diabetic retinopathy, hemorrhaging of the blood vessels in the retina, the light-sensitive tissue at the back of the eye. High blood sugar levels can cause the blood vessels in the eyes to swell and leak, causing blindness, one of the leading complications of diabetes.

### A possible fix

Mehta said he would perform surgery that could fix the problem. Romo said the doctor's calm yet direct manner made him and his wife Jennifer feel informed as well as in good hands.

"He didn't give us false hope, but he said, 'I do this surgery all the time,' " the restaurant executive recalled. "He was very confident in his communication with us and very realistic."

The day after outpatient surgery, Romo returned to have the bandage removed. He was able to see with his right eye immediately. More than two years later, his vision has remained clear, measuring 20/15.

Mehta still monitors Romo's eyes closely for any changes, given his diabetes. And as a result of their experience, the Romos have become impassioned GHEI donors.

### **Giving back**

"We reflected on the question of how on earth do you thank a man for saving your vision?" Jennifer Romo said.

The couple asked Mehta, who told them about the 20/20 Society, a group that raises funds to support sight-saving research at GHEI.

In addition to giving to the society, the Romos have taken the time and effort to learn more about the work GHEI does and how donations contribute to the cause of vision health for all.

"There's this bigger impact that we weren't aware of," Jennifer Romo said.

### Diabetic retinopathy on the rise

In fact, Romo's vision problem is all too common these days.

"Because diabetes has reached epidemic proportions, we are seeing cases like Mr. Romo's all of the time," said Mehta.

"Ernie and Jennifer are two of the nicest people I have ever met and I feel blessed to be able to help people like them," When someone so young loses their eyesight, the end result could be devastating.

"I thank them for being so generous and donating to the 20/20 society so we can help even more people through research breakthroughs at the Gavin Herbert Eye Institute."

### Thank you to our donors

Gifts of \$25,000 and above received since July 1, 2019, to the general fund of the Gavin Herbert Eye Institute: Helen & Jacob Shaham Foundation

### Gifts of \$25,000 and above received since July 2019 to the Roger F. Steinert, MD Endowed Chair:

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iaijali Fallu, MD

### Gifts of \$50,000 and above received since July 1, 2019 to

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To make a donation towards either Endowed Chair, contact Janice Briggs, senior executive director of development, at 949-824-0091 or jbriggs@uci.edu

### Gifts of \$10,000 and above received since July 1, 2019 for research:

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### UCI Health Gavin Herbert Eye Institute

850 Health Sciences Road Irvine, CA 92697

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### **EVENTS**

**Location for all events:** 850 Health Sciences Road, 3<sup>rd</sup> floor, Irvine, CA 92697

**RSVP for all events:** ghei@uci.edu | 949-824-7243

In an abundance of caution against spreading the novel coronavirus, eye institute events and seminars through May 31 have been cancelled.

### **Community lectures**

Low Vision Impaired Vision in Both Eyes? What to Do Next Rebecca Kammer, OD, PhD Tuesday, June 9 | 7 - 8 p.m.

### **Diabetes**

Saving Vision for Diabetics Andrew Browne, MD, PhD Eating for a Longer Life Ping Wang, MD (from Diabetes Center) Tuesday, Sept. 15 | 7 - 8 p.m.

### **Cataracts and Glaucoma**

Everything Your Doctor Won't Tell You about Cataracts Matt Wade, MD What You Need to Know About this Infamous Killer Ken Lin, MD, PhD **Tuesday, Nov. 17 | 7 - 8 p.m.** 

### **Clinic locations**

850 Health Sciences Road, Irvine, CA 92697

101 The City Drive South, Pav. 2, Orange, CA 92868

**To make an appointment:** 949-824-2020