UCI Health

the

C Gavin Herbert Eye Institute

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RESEARCH UPDATE

Fall 2019

Blue light: what's the risk?

SHINE

Retina specialist Dr. Mitul Mehta paid special attention to the booth next to him at a technology conference he attended last year in San Francisco.

There, the founder and owner of a company called EyeJust was touting her product, an iPhone screen protector that she said protected more than the screen: it shielded the users of iPhones from the health problems related to blue light.

Mehta, an expert on blue light rays at the UCI Health Gavin Herbert Eye Institute (GHEI), wondered if her claims were true and asked the owner how she knew the filters were doing their job.

"Blue light is associated with retinal damage and dry macular degeneration," he said. "The blue spectrum



is a higher energy wavelength of light and those have been associated with a lot of things. The most well-established of these is interfering with sleep."

Blue light isn't all bad, Mehta said. Special lamps employ it to help people who become depressed during short, dark days in colder climates. But staring into a phone for hours every day is another matter, especially when you consider that the newly popular LED household lights also give off more blue-spectrum light rays.

Cell phones can be a special problem when used before bedtime, Mehta said, partly because of the apparent effect on sleep, and partly because people are more likely to have other lights off, which means their pupils are dilated, taking in more of the blue light.

Many cell phones come equipped with "red shifting" for evening viewing, putting more red spectrum rays into the light they emit. This reduces blue light exposure, Mehta said, but also makes the screen less readable.

Those were among the reasons why Gigi Mortimer, who had been a sunglasses designer, thought of creating her blue light filter, which so far is made only for Apple products. "The average American is spending seven-plus hours on their phone," Mortimer said. "When I realized it was wrecking my health and my children's health because we couldn't sleep, I went on a mission to find a solution.

The question was how effectively the screens worked, and though Mortimer had paid a third-party tester to check out her product, she was intrigued by Mehta's questions and the possibility of having a prestigious, highly trusted organization do first-rate scientific testing. He, in turn, was intrigued by the idea of finding out exactly how well the screens worked.

Two GHEI residents, Dr. Jordan Conger and Dr. Andrew Smith, carried out the research.

The results?

"The blue light screen filter did a pretty decent job of screening the blue light," Mehta said. "Not as much as red shifting, but it blocked a significant percentage at different settings. And the screen was much more visible with the filter, same as if you were seeing it without one."

The research by the residents at GHEI will go on, with funding from EyeJust, in hopes of adding to and refining their products' protective features.

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 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 Donald S. Minckler, MD

Optometry

Joseph Bui, OD Timothy Scott Liegler, OD Kailey A. Marshall, OD Linda Shi, OD Poonam Varsani, 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

Uveitis

Sanjay Kedhar, 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 Baruch D. Kuppermann, MD, PhD Anthony B. Nesburn, MD Vice Chair, Research Krzysztof Palczewski, PhD Eric Pearlman, PhD Jing Yang, PhD

GHEI: A brilliant future

S o much exciting research is going on at Gavin Herbert Eye Institute, including endeavors on retinal disease, corneal disease and glaucoma. The institute's researchers have received numerous new federal and foundation grants for their work; among those whose work will go forward with such grants are M. Cristina Kenney, MD, PhD, Lbachir BenMohamed, PhD and Tibor Juhasz, PhD.

Of course, our most recent large research effort has been the Center for Translational Vision Research, whose goal is bringing groundbreaking integrated, interdisciplinary basic research from the laboratory to patients in the form of novel pharmacological treatments. It has now been a year since we made our first announcement about this exciting endeavor, which began with the hiring of Krzysztof Palczewski and his team, including Tim Kern and Philip Kiser, who came here from Case Western Reserve University. This group has greatly advanced science's understanding of retinal diseases.

The center will have five core research faculty, including the core group recruited from Case Western, as well as Andrew Browne, a retina faculty member at GHEI, and 30 to 40 scientists overall, many of whom came with Palczewski, Kern and Kiser. We are now on the verge of hiring a final member of the core research team and his or her own group of some 10 researchers. I expect to have an announcement about this in early 2020.

The concept of a Center for Translational Vision Research has garnered intense interest from private sector supporters. Allergan has committed \$1.5 million to the center, with a promise of more to come. Zeiss has donated more than \$300,000 in equipment and we are in communication with a third giant in eye care about an additional donation. We also are in discussions with university officials about having the center designated as an official "organized research unit." UC Irvine defines these as academic units with a focused, interdisciplinary research and studenttraining focus "that cannot be pursued in the existing departmental and school organizational structures."

This special designation would grant the center a measure of independence in administering its funds and activities, and would provide it with special status that would highlight the innovative research already being done there and as well as what is planned for the future.

Finally, we would like to share with you the wonderful news that Krzysztof Palczewski, PhD, has been elected to the National Academy of Medicine. Dr. Palczewski is now among two UCI faculty who are members of the National Academy of Medicine, one of the highest professional distinctions accorded to an individual contributing to the fields of medical sciences, healthcare, and public health.

The future looks bright for research at GHEI. We are excited about the potential for making a real difference in the care of our patients with blinding diseases.



Rouch les frinan

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

Treating macular degeneration close to home



Sally Phillips

Sally Phillips is still grateful to the friend who suggested she seek out UCI Health ophthalmologist Dr. Baruch Kuppermann to treat her vision loss due to macular degeneration. "Her husband is a physician and he said Dr. Kuppermann was tops in his field," she said.

Phillips was ready for a change. Diagnosed with macular degeneration more than a decade earlier, she had been making the long, traffic-choked trip to a Los Angeles clinic for treatment, and turnover there meant she was treated by a different doctor too often for her comfort – four times within a few years. It's a relief to have a doctor she likes and trusts as much as Kuppermann, who has been treating her for seven years so far. It doesn't hurt that his office at the UCI Health Gavin Herbert Eye Institute is 10 minutes from her Newport Coast home.

Kuppermann is now, of course, director of the eye institute and chair of the UCI School of Medicine's Department of Ophthalmology, but he continues to see his regular patients. Phillips' visits four times a year are filled with friendly talk about family, travel and sometimes important issues of the day, she said.

"Eyes are a kind of delicate part of the body," she said. "He exuded confidence, and I had full faith in him."

At some point during her years of trekking to Los Angeles, Phillips experienced leakage from blood vessels in her left eye. To stop it, doctors offered her a choice of eye injections or laser photocoagulation. She chose the latter, which sounded less invasive and frightening, but the treatment also can result in blind spots, which is what happened to her.

When Phillips saw Kuppermann, he explained the alternative eye injections to her in ways that made that idea more acceptable, and they stopped the leakage. He also recommended certain vitamins.

"He's just fantastic," Phillips said. "So knowledgeable, so intelligent. I adored him from day one."

A chance at second sight

By Tom Sullivan

"When I dream," the woman says, "my vision is 20/20."

Kristen Macdonald lives with retinitis pigmentosa, a disease of the retina that gradually robs a person of most of their vision. "It got to a point where I could only see small amounts of light and shadows, not very helpful if you want to live independently. I was born in Canada and raised in New Jersey. I enjoyed all sports most of all I loved to ride horses."

Macdonald had a promising acting career, but as her vision dimmed so did the lights of Broadway and Hollywood. "You have to survive, so when the acting jobs weren't happening I went to work for a major production company."

Macdonald lives alone, manages to go to the gym every day, dress impeccably and is a terrific cook. "I've learned to adjust, but to go from the complete freedom of vision to have to depend on a white cane has really been tough. I know I've had to accept the fact that I am blind, but now for the first time I have real hope."

The hope for Macdonald and a small group of carefully selected patients comes from a clinical trial started by Dr. Henry Klassen at the UCI Gavin Herbert Eye Institute (GHEI). Healthy stem cells are injected into the retina of study participants with the goal of stimulating the eye function to become more normal.

Macdonald says she and other trial participants received varying numbers of cells in order to effectively measure the results.

"I was given a million cells, which sounds like a lot, but actually it was on the lower end. I really didn't know what to expect. For a while, nothing happened and I have to admit, I started to become depressed. The change began so gradually that I almost didn't notice, but one early evening, I started to see lights coming from adjoining apartments. For the first time in years, I could use light as a tool to navigate. I began to get really excited about what the stem cells must be doing."



Kristen Macdonald

"One of the hardest things to do as a blind woman is the ritual of putting on your daily make-up. So there I was, in front of a mirror that up to this point offered no reflection. Was it just my wishful thinking or was something really happening? I could see my reflection as I applied brightly colored eye shadow. My hands started to shake and I was crying uncontrollably, not because I was sad, but because I was feeling a kind of happiness I can't describe.

"If I was noticing this kind of improvement from a minimal number of stem cells, maybe the potential to see again and make my dreams become a reality was possible. With the continuing support of the doctors at the eye institute, I am starting to believe that there's a chance for second sight."

Tom Sullivan is an author, actor, singer, entertainer, and producer who is passionate about supporting medical research to preserve sight.

For the greater cause



Geneva M. Matlock, MD

Dr. Geneva M. Matlock doesn't just want to battle her own case of age-related macular degeneration. She wants to fight for others as well.

That's why she has become a regular donor to research efforts on the disease at Gavin Herbert Eye Institute (GHEI), generously providing both direct cash gifts and also setting up charitable gift annuities.

The annuities guarantee her a fixed lifetime income stream while also providing generous, ongoing, tax-deductible gifts to GHEI. Payments are based on the donor's expected lifespan, which in her case started when she was 85. "Now I'm 95," she said with a chuckle.

Matlock chose to make her donations toward continuing GHEI's research on stem cells for retinal regeneration.

A retired anesthesiologist, Matlock first noticed something wrong with her left eye about 15 years ago during a trip to New York City. Because her late husband was a retired Air Force colonel, she first sought care through military medical services in San Diego, where her macular degeneration was diagnosed and treated. But the drives from Orange County were wearing. About 12 years ago, she asked knowledgeable people for referrals to the best local ophthalmologist for her condition. They gave her the name of Dr. Baruch Kuppermann, who now is the director of GHEI.

The condition later appeared in Matlock's right eye as well, but with continued care by Kuppermann, her condition is stable, she said. She lives independently in her San Clemente house, where because of vision-preserving care, "I'm able to look out of my house at the beautiful, wide ocean view."

Thank you to our donors

Gifts of \$50,000 and above received since July 2018 to the Roger F. Steinert, MD Endowed Chair: Anne Brownstein

Gifts of \$50,000 and above received since July 2018 to the Irving H. Leopold, MD Endowed Professorship: Josephine Herbert Gleis Foundation

To make a donation toward either endowed chair, contact Janice Briggs, executive director of development, at jbriggs@uci.edu or 949-824-0091.

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UCI Health

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Uveitis: What you and your rheumatologist should know about eye inflammation Sanjay Kedhar, MD

Tuesday, Jan. 14, 2020 | 7–8 p.m. Oculoplastics: Rejuvenating the aging eyelids

Lilangi Ediriwickrema, MD, MS

Tuesday, Feb. 11, 2020 | 7–8 p.m. Dry and irritated eyes

Marjan Farid, MD

Tuesday, March 10, 2020 | 7-8 p.m.

Age-related macular degeneration: what you should know Mohammad Riazi, MD -and-Flashes and floaters: Impaired vision in both eyes? What to do next? Mitul Mehta, MD

Make an appointment

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