



DISCOVERY

THE DISCOVERY EYE FOUNDATION

A black magnifying glass with a silver handle is positioned over the letter 'O' in the word 'DISCOVERY'.

The Discovery Eye Foundation supports cutting-edge research related to sight-threatening eye diseases and their treatments.

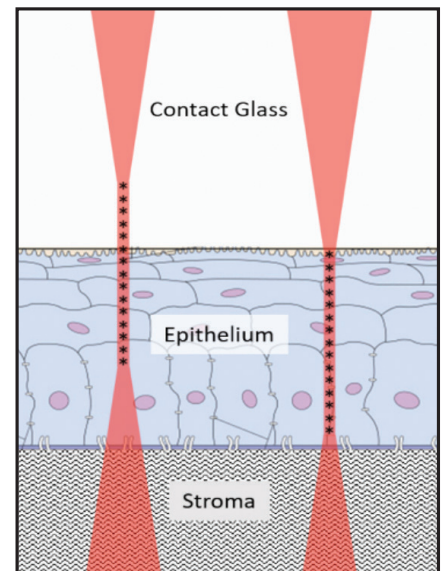
Spring 2022

DEF-Supported Breakthroughs in Treatment for Keratoconus

Advances in corneal crosslinking (CXL) for treating keratoconus (KC) are being made by DEF-funded researcher James Jester, PhD, the Jack H. Skirball Endowed Research Chair and professor in the Department of Ophthalmology and Gavin Herbert Eye Institute at UC Irvine.

CXL increases the stiffness of weak corneas to treat corneal thinning, progressive astigmatism and KC. It involves treating the thin cornea with the vitamin riboflavin and ultraviolet (UV) light. This generates oxygen-free radicals and chemical crosslinking that leads to the stiffening of the cornea.

Jester's research has led to a novel technique using laser micro-machining to create small channels through the corneal epithelium that significantly enhance the penetration of riboflavin into the cornea (illustrated at right).



“It’s a dramatic improvement,” Jester says. “We’ve also shown you can then perform non-linear crosslinking, and there’s no damage to the epithelium using this epithelium-on (epi-on) approach.”

“When you do regular UV cross-linking with an epi-on approach, all the riboflavin that sits in the epithelium after you’ve penetrated

Supporting vision-saving research at the University of California, Irvine’s Gavin Herbert Eye Institute since 2002.

(continued inside)

8635 West Third St., Suite 390W
Los Angeles, CA 90048
(310) 623-4466
contactus@discoveryeye.org
www.discoveryeye.org
www.discoveryeye.org/blog

Founders

Morris S. Pynoos*
Rita J. Pynoos*

Board of Directors

Jack L. Schoellerman
Chair

Anthony B. Nesburn, MD, FACS
President/Medical Director

Ryan Fisher
Jon Pynoos, PhD
Vice Presidents

Joan Seidel
Treasurer

M. Cristina Kenney, MD, PhD
Secretary/Research Director

Cassie DeYoung
Gavin Herbert
Tom Sullivan

Lifetime Trustees

David S. Boyer, MD
Iris Cantor
Judy Carroll
Cliff Einstein
Mandy Einstein
Beverly Gelfand

Roni Cohen Leiderman, PhD
Allen Posner, OD*
Rita J. Pynoos*
Sylvia Weisz*

** deceased*

The information published in the DEF newsletter is intended to help you better understand various eye diseases and available treatment options. DEF does not sell or endorse products, treatments or procedures. Every effort has been made to ensure the accuracy of the information presented. It is not intended to be a substitute for the advice and recommendations of your professional eye-care providers.

DEF-Supported Breakthroughs

(continued from front)

it into the cornea gets photoactivated. This is bad, because it kills the adjacent epithelium, negating the benefits of an epi-on procedure.” With this method, patients wake up with pain and delayed visual acuity caused by the damage to the epithelium.

Jester found that the new laser micro-machining procedure is much more beneficial when using a non-linear optical approach (NLO). “Right now, we’re doing studies to verify how much damage occurs when you do UV crosslinking versus NLO,” he says. “We’re still trying to improve the delivery.” Currently, it can take an hour or more to deliver and radiate the riboflavin to achieve CXL. Jester is trying to decrease the time to 10 minutes or less.

“We’re making headway,” Jester says. “We’ve addressed the hurdle of keeping the epithelium on. We believe damage to the epithelium is the main cause for the delayed visual recovery and postoperative pain that are associated with the procedure, which is quite unbearable for patients.” With the new micro-machining procedure combined with an NLO approach, the epithelium remains undamaged.

The team is also creating an inexpensive, ultra-fast laser that is specifically designed to photoactivate riboflavin. Once they have that, the next step, Jester says, is to build the device for use on humans in a clinical study.

“We are glad to be providing ongoing support for this project, which could lead to a new tool for treatment of KC and other blinding corneal diseases,” says Dr. Anthony Nesburn, DEF’s medical director.



What Will Your Legacy Be?

DEF’s Vision Legacy society offers an easy and meaningful way to make a vision-saving difference beyond your lifetime. You can even

use your estate gift for a specific project, such as age-related macular degeneration, keratoconus or stem-cell research. For more about joining this important group, call (310) 623-4466, or visit www.discoveryeye.planningyourlegacy.org.

Meet the Researcher: Nikhil Addleman

Nikhil Addleman has always loved mathematics. The California native thought he'd study "pure" mathematics, but he became interested in applied and empirical research during his last year of college at the University of New Mexico. Then, a stint doing research on epidemiology also sparked a new penchant for medical and health research.



All this led him to UC Irvine's Institute for Mathematical Behavioral Sciences (IMBS), where he earned his PhD in 2021. "IMBS is a social sciences program at UC Irvine, where there's lots of mathematical and statistical techniques for supplementing and tackling hard problems in social sciences," Addleman explains.

At IMBS, he met Dr. Kimberly Jameson, who was working on a color vision and retinal disease project — a collaboration between Jameson and DEF Research Director Dr. Cristina Kenney. Since one of the early signs of macular degeneration is the loss of color-vision perception, the laboratories are studying color vision in an effort to develop a new tool for early diagnosis of age-related macular degeneration (AMD) and other blinding diseases.

"Dr. Jameson asked me to take a look at some data she had, because it's a complicated problem, and she knew I had expertise on some of the statistics and machine learning techniques," Addleman says. "She introduced me to Dr. Kenney, and I've been able to continue

my research with the support of the Discovery Eye Foundation."

In fact, Addleman, now a research fellow at UC Irvine, has been given DEF's 2021 Outstanding Research Award. The DEF Research Scholar Program recognizes young scientists who are making contributions in important eye diseases, such as AMD, keratoconus and glaucoma. Each scholar submits a detailed description of their work, which is then evaluated by experts in the field.

"I've been able to continue my research with the support of the Discovery Eye Foundation."

"Nikhil has a strong background in mathematics and brings exciting new methods, such as machine learning, that can be applied to the molecular data generated in the laboratory," Kenney says.

"We're using a sample of genetic and some demographic information from patients at the clinics at UC Irvine with more sophisticated statistical and machine learning techniques to discover the relationships, especially genetic markers, for the onset of macular degeneration," Addleman says. "Hopefully, we'll uncover some new genetic risk factors that will point to a biological cause for the onset of the disease and that can be used for early warning or even the development of a treatment."

"I am very grateful to DEF's supporters," he adds. "This award enables me, as a young scientist, to pursue this really important, scientific, humane project."

“We Support People We Respect”

A Los Angeles native and retiring lawyer, Martin Blank and his wife, Linda, also a retired lawyer, have been longtime donors to the Discovery Eye Foundation.



and has generously provided funds with a focus on AMD research.

“Both personally and through the foundation, we support *people*,” Blank says.

Their connection to DEF began some three decades ago, when DEF Medical Director Dr. Anthony Nesburn became Martin Blank’s eye doctor. Their relationship grew to be not only professional, but personal — and philanthropic.

Blank is a co-trustee of The Rosalinde and Arthur Gilbert Foundation, which works to improve communities in Southern California and Israel.

DEF Research Director Dr. Cristina Kenney’s work related to conditions of aging, including age-related macular degeneration (AMD), matches the foundation’s objectives and qualifies DEF to receive grants. The Gilbert Foundation began supporting DEF in 2007

“We support people we respect, who are doing good work and who are important to us.”

“For Marty and Linda to believe in our work so much that they helped us garner support from The Gilbert Foundation is very humbling,” Nesburn says. “It’s a Southern California institution, and their donations allow us to continue our work on treatments for AMD and other sight-robbing diseases.”

“The conditions Discovery works on are more prevalent in people of advanced age, such as myself and Linda, and they are conditions we are likely to get,” Blank says. “Anybody who is doing work that will make that not happen is something we want to support.”

6

Easy Ways to Help DEF

Discovery Eye Foundation’s groundbreaking research needs your help to move forward. Try these easy ways to support DEF and its sight-saving work:

1. Shop using **smile.amazon.com** instead of amazon.com.
2. Celebrate events or honor others with a **tribute donation** to DEF.
3. Enjoy the ease of **monthly donations** charged to a credit card.
4. Maximize your gift by using your employer’s **matching program**.
5. Donate **stocks and bonds or cars** in DEF’s name.
6. Join our **Vision Legacy** planned-giving society, and leave the gift of sight.

For more details, visit www.discoveryeye.org/other-ways-you-can-help.