

USC Roski Eye Institute Press Office • 1450 San Pablo Street, 4<sup>th</sup> Floor, Los Angeles, California 90033  
USCEye.org @USCEye

**Contact:** Sherri Snelling [sherri.snelling@med.usc.edu](mailto:sherri.snelling@med.usc.edu) or 949-887-1903

---

**Thursday, September 7, 2017**

**Researchers at USC Roski Eye Institute are first to show LASIK Xtra does not increase corneal stiffness using revolutionary Brillouin microscopy method to measure corneal biomechanics**

*USC first on West Coast to offer Brillouin microscopy method to detect corneal ectatic disorders through funding from The Ahmanson Foundation*

---

LOS ANGELES – Adding a new data point in the ongoing controversy in ophthalmology surrounding the impact of combined prophylactic corneal cross-linking (CXL) and LASIK flap creation, [USC Roski Eye Institute](#) published the first study to demonstrate the lack of corneal biomechanical impact using the revolutionary Brillouin microscopy method in the [Journal of Refractive Surgery](#).

The research led by USC Roski Eye Institute’s [J. Bradley Randleman](#), MD, along with collaborator Giuliani Scarcelli, PhD, measures the corneal biomechanics in a non-contact, non-perturbative way allowing clinicians to understand the different corneal properties, such as shape and elasticity, in each individual patient in the research setting. By accounting for these properties in vivo, the Brillouin microscopy method may allow physicians to create personalized treatment plans for more precise identification of ectatic disorders with the goal of preventing corneal transplantation, or even blindness, from conditions such as keratoconus, congenital brittle cornea syndrome and pellucid marginal corneal degeneration.

Many ophthalmic surgeons have debated the impact – whether beneficial or not – of the rapid CXL with LASIK flap creation called “LASIK Xtra.” It has been proposed that the procedure is useful in protecting patients from developing ectasia and may even improve the stability of higher laser corrections. USC researchers are the first to provide evidence to support the contrary.

“The novel Brillouin microscopy results offer new insight into whether there is a positive impact on patients who undergo the LASIK Xtra procedure,” said Randleman, a recognized international pioneer in corneal cross-linking (CXL) procedures who is the director of USC Roski Eye Institute’s Cornea, External Disease and Refractive Surgery. “Our findings have shown no significant increase in corneal stiffness after performing CXL combined with LASIK flap creation.”

Applying broad applications, Randleman believes this revolutionary technique can help vastly improve methods of diagnosing corneal ectatic disorders. Earlier diagnosis can potentially reduce or eliminate the need for corneal transplants and increase success in preserving sight.

## **USC Roski Eye Institute Offers Revolutionary Brillouin Microscopy for Earlier, More Precise Corneal Disease Detection Through The Ahmanson Foundation Support**

**2-2-2-2**

### **USC First on West Coast to Have Brillouin Microscopes Thanks to The Ahmanson Foundation Support**

Randleman acknowledged USC's continued commitment to this unique method, "We conducted our research in collaboration with Dr. Scarcelli's renowned lab at the University of Maryland, but with the recent generous funding from The Ahmanson Foundation, USC Roski Eye Institute becomes the first in Los Angeles – in fact the entire West Coast – and only the third institution in the country to use the unique Brillouin microscopy technology."

To date, prototypes of the unique Brillouin microscopes have only been available in laboratories in Boston and Maryland. Through the funding provided by The Ahmanson Foundation, these microscopes will be used for the first time on the West Coast at the USC Roski Eye Institute.

"The availability of adequate tools for diagnosis is critical to the success of advancements in precision medicine. This Foundation recognizes the importance of innovations such as the Brillouin microscope, and is pleased to partner with USC," said William H. Ahmanson, president of The Ahmanson Foundation.

The cornea is the transparent, dome-shaped front layer of the eye that is most critical for clear vision. Keratoconus, which presents in the teens or early 20s, is a progressive disease where the thinning of the cornea produces warping and bulging that can lead to severe visual distortion. Another corneal disorder is brittle cornea syndrome which is seen in newborns and young children and requires lifelong monitoring. These are just two of the corneal ectatic diseases that were first described in the mid-1700s, but today still offer little understanding as to the development and progression of these diseases.

"The revolutionary Brillouin microscopy method dramatically changes our ability to treat diseases affecting the cornea, and we are grateful to The Ahmanson Foundation for supporting USC's leadership to preserve and restore sight in both adults and children," said [Jonathan Song](#), MD, MBA, a recognized national cornea specialist and pediatric ophthalmologist with USC Roski Eye Institute.

The Brillouin microscopy measures biomechanical properties of each layer the light passes through in the front of the eye essentially performing a living biopsy of the cornea without touching or otherwise disturbing it. The powerful microscopes measure natural light scattering that occurs when the cornea moves every millisecond due to constant, subtle changes in temperature. Earlier and more precise detection of corneal ectatic disorders can possibly help some patients avoid surgeries that can weaken the cornea and potentially avoid corneal transplantation. According to the National Eye Institute, more than 33,000 Americans receive corneal transplants each year.

"The Ahmanson Foundation serves Los Angeles County by funding capital projects in a variety of areas including health care," continued Ahmanson. "We strive to enhance the quality of life for all Angelinos."

## **USC Roski Eye Institute Offers Revolutionary Brillouin Microscopy for Earlier, More Precise Corneal Disease Detection Through The Ahmanson Foundation Support 3-3-3-3**

### **About the USC Roski Eye Institute ([usceye.org](http://usceye.org))**

The USC Roski Eye Institute, part of the Keck Medicine of USC university-based medical enterprise, has been a leader in scientific research and innovative clinical treatments for more than 40 years.

Ranked No. 2 in National Eye Institute (NEI) research grants for academically-based ophthalmology departments and nationally ranked in *U.S. News & World Report's* annual "Best Hospitals" issue for more than 24 years, the USC Roski Eye Institute is headquartered in Los Angeles with clinics in Arcadia, Beverly Hills and Pasadena. Faculty physicians are also the exclusive ophthalmic doctors affiliated with L.A. County + USC Medical Center (LAC+USC) and Children's Hospital Los Angeles (CHLA).

Patients from across the country come to see the USC Roski Eye Institute experts who treat a comprehensive array of eye diseases across the life spectrum from infants to aging seniors. The USC Roski Eye Institute is known for its scientific research and clinical innovation including:

- Creator of the FDA approved Argus retinal prosthesis implant (also known as the "bionic eye") for retinitis pigmentosa patients
- Leader in NEI eye disease research among multi-ethnic populations
- Developer of stem cell therapies for those who have age-related macular degeneration
- Discovered the gene that is the cause of the most common eye cancer in children
- Treatment for eye infections for AIDS patients
- Inventors of the FDA approved XEN stent, the most widely used glaucoma implant in the world
- Pioneers of a device for long-term intraocular drug delivery
- Creator 25 years ago and ongoing leader in OCT research
- Part of the Human Connectome brain mapping research team for eye disease and prevention

### **About The Ahmanson Foundation**

The Ahmanson Foundation serves Los Angeles County by funding cultural projects in the arts and humanities, education at all levels, health care, programs related to homelessness and underserved populations as well as a wide range of human services. By supporting non-profit organizations that demonstrate sound fiscal management, efficient operation, and program integrity, the Foundation strives to enhance the quality of life and cultural legacy of the Los Angeles community.

# # #