



## ARVO 2018 Annual Meeting Emerging Trends and Hot Topics

**Honolulu, Hawaii** – In their own words, First Authors at the 2018 Annual Meeting of the Association for Research in Vision and Ophthalmology explain their findings. Their abstracts were designated as some of the newest and most innovative research being conducted in various specialties and are being presented on Sunday, April 29. To view abstracts, enter the program number or title in the "Search" field of the [Online Planner](#) or [mobile app](#).

### **Sunday, April 29**

#### **Anatomy and Pathology/Oncology**

687 - C0282. The effect of blue light on the guinea pigs with lens induced myopia. 1:00pm

Whether and which direction blue light can intervene myopia progression remained controversial. This research found that guinea pigs under blue light were more hyperopic than under white light, and produced less retinoic acid (Vitamin A), and increase RA can make guinea pigs more myopic, instead, reduce RA can make them more hyperopic.

#### **Cornea**

747. Native-Like, Cell-Laden, Orthogonal-Multilayer and Transplantable Tissue- Engineered Corneal Stroma Induced by a Mechanical Collagen Microenvironment. 4:30pm

In the present study, we construct a four-layer compressed collagen (CC) sheet laden with corneal stromal cells (CSCs) and a four-layer stretched compressed collagen (SCC) sheet, in which collagen fibres are arranged orthogonally to each other. We explore native-like tissue engineered corneal stroma induced by collagen mechanical microenvironments in vitro and in vivo, which may provide valuable new insights and tools relevant to development, growth, remodeling, regeneration and fibrosis pathologies associated with cornea and other connective tissues, in general.

## **Immunology/Microbiology**

717. The Use of Predatory Prokaryotes to Control an Ocular Pathogen in the Vitreous. 3:30pm

Antibiotic resistant microorganisms are an increasing cause for concern in hospitals around the world. In an attempt to find innovative approaches to control antibiotic resistant bacteria, we tested whether predatory bacteria (bacteria that eat other bacteria) could successfully control the growth of a bacterial pathogen inside the eye. We determined that the predatory bacteria (*Bdellovibrio bacteriovorus* or *Micavibrio aeruginosavorus*) could reduce the number of antibiotic-resistant *Pseudomonas aeruginosa* able to grow inside the eye by 30-fold. This study offers a "Proof of Principle" suggesting that these bacteria devouring microbes could be developed as alternative therapy for eye infections when antibiotics fail.

## **Multidisciplinary Ophthalmic Imaging Group**

295 - C0196. Investigating the functional response of cone photoreceptors during bleaching and dark adaptation with 1.7MHz optical coherence tomography. 8:15am

Vision begins when photoreceptors in the retina absorb photons and generate a signal destined for the brain. In blinding retinal diseases such as retinitis pigmentosa and age-related macular degeneration, vision is lost when these cells become dysfunctional. Current methods for diagnosing and assessing retinal disease--such as examining the appearance of the retina in clinical images and assessing visual function with clinical exams--are effective after extensive pathological changes, but not in the early stages of disease. Many therapeutic interventions, however, are most effective early in disease progression, so there is great need for early diagnosis of functional deficits. In the present work, we describe a method for noninvasively assessing the function of photoreceptors by observing and quantifying very fast morphological changes that occur when the cells detect light. In order to observe these changes, we designed and built the fastest retinal OCT system in the world (to our knowledge), capable of completing 1.7 million depth scans of the retina per second, and analyzed its images with cutting-edge computational techniques.

## **Retina**

883 - A0215. Post-vitrectomy ocular hemorrhage among United States adults on oral antithrombotics. 3:15pm

Treatments (called anti-thrombotics) that prevent the formation of blood clots, which can subsequently cause life-threatening events such as stroke, heart attack, and damage to the body's organs, can increase the risk of bleeding during surgery in some patients. For patients who undergo surgery in the eye, and who receive these medications, there is a risk of bleeding into the eye following surgery, which may lead to significant loss of vision. To assess the level of risk in these patients, we used data from a large health care database that compiles anonymous information on patient illness and subsequent treatment to determine whether use of these drugs is associated with bleeding in the eye following eye surgery. Our results show that the risk of bleeding into the eye following surgery is 22% higher for patients receiving antithrombotic medication, specifically anticoagulant and antiplatelet therapies, than for those who did not receive these medicines. Novel oral anticoagulants did not increase the odds of bleeding in the eye following eye surgery. This information is important to both patients and doctors as

it can guide doctors about what patients should be told as part of providing informed consent prior to surgery in the eye.

### **Retinal Cell Biology**

1005 - B0259. Long-term Rescue of Photoreceptors in a Rodent Model of Retinitis Pigmentosa Associated with MERTK Gene Mutation. 3:15pm

Retinitis Pigmentosa is the most common form of inherited retinal degeneration, and currently has no cure. One form of this disease causes loss of photoreceptors due to reduced support of their metabolism by retinal pigment epithelium. Using an animal model with such mutation, we demonstrated that subretinal surgery or laser therapy can preserve a significant fraction of photoreceptors and thereby extend vision at least 3 times longer than in untreated controls.