RETINA RESEARCH FOUNDATION
NEWSLETTER
Foresight for Sight | **April 2016** | Issue Number 1 / Volume 38

Retina Research Foundation Newsletter is published three times per year: Spring, Summer and Fall.

ICO – Retina Research Foundation Helmerich Fellowships

Each year since 2010, **two ICO – RRF Helmerich Fellowships** are awarded by the International Council of Ophthalmology (ICO) to young ophthalmologists from developing countries who are committed to enhancing ophthalmic education and patient care in their home countries. Recipients chosen have been recommended by the head of a teaching or public service institution and must have a commitment to return to a position at a teaching institution or public service hospital in their home country following the fellowship.

Each fellowship provides support for **one year of ophthalmology subspecialty training** at one of the world's leading ophthalmology centers. This is the only one-year fellowship program offered by ICO, and all other ICO international fellowships are for three months of training support. Funding of this program is provided to ICO Foundation by Retina Research Foundation, in honor of the public service leadership of Mr. W. H. Helmerich, III.

Dr. Ventura with a pediatric patient in Recife

This article profiles two outstanding Helmerich Fellows from the past several years. Excerpts are taken from their post-fellowship reports.

Bruna Ventura, MD ***(from Brazil)***
Fellowship in Cornea, Cataract, and Refractive Surgery, Baylor College of Medicine, Houston, TX; Training with Douglas Koch, MD, Professor and Allen, Mosbacher, and Law Chair, Dept. of Ophthalmology; May 2013 – April 2014.

Dr. Douglas Koch and Dr. Bruna Ventura

"It was a great honor and privilege to receive the ICO – Retina Research Foundation Helmerich Fellowship grant….
The ICO - RRF Helmerich Fellowship enabled me to do a Research Fellowship in Cataract and Refractive Surgery at Baylor College of Medicine in Houston, USA, under the mentorship of Dr. Douglas Koch.

The fellowship was very important to provide me with more knowledge in the fields of Cataract and Refractive Surgery, besides offering rich opportunities in research. When returning to Brazil, I became the Vice-Mentor of the Specialization Course in Ophthalmology of the Altino Ventura Foundation, in Recife, Brazil, and the Coordinator of the Cataract Department of the Altino Ventura Foundation. Thus, I am able to teach residents and fellows everything that I learned abroad."

Report dated July 2014

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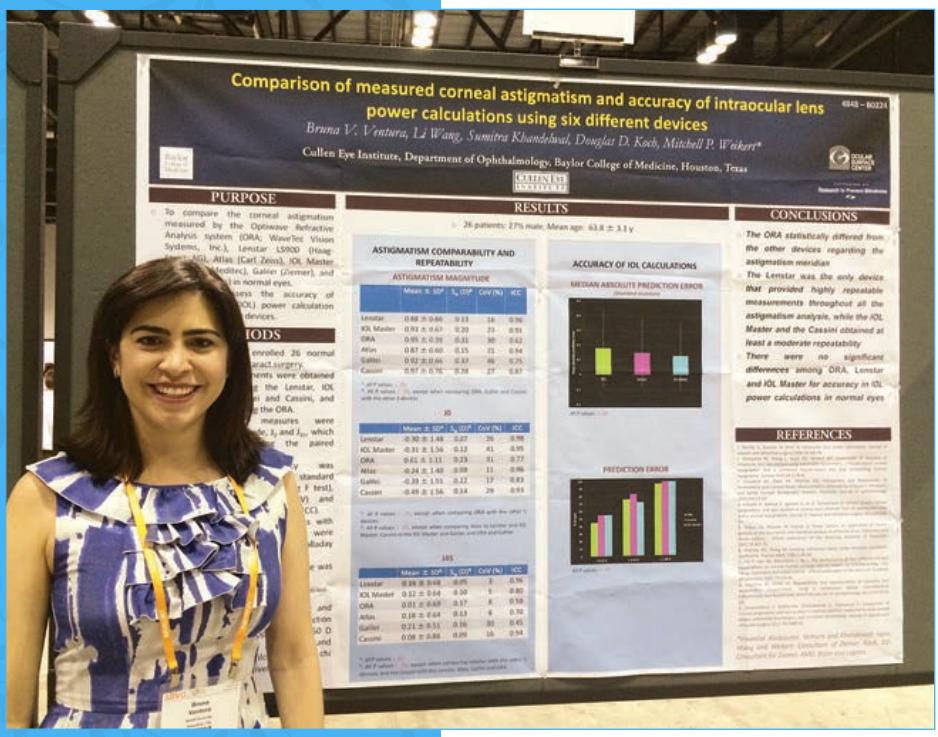

Dr. Ventura's poster presentation, 2014 ARVO Meeting

Dr. Ventura continues to teach and treat patients at the Altino Ventura Foundation and the HOPE Eye Hospital in Recife, Brazil.

Guillermo Saucedo-Villanueva, MD ***(from Mexico)***
Fellowship in Vitreoretinal Diseases and Surgery, University of Colorado, Denver, CO; Training with Hugo Quiroz-Mercado, MD, Director of Ophthalmology, Denver Health Medical Center; July 1, 2013 – June 30, 2014.

Dr. Guillermo Salcedo-Villanueva

"The fellowship allowed me to complement my training as a Retina Specialist by being exposed to different areas of our field, like Ocular Oncology and Pediatric Retina, as well as expand my knowledge and expertise on diseases that are the leading causes of blindness, like Diabetic Retinopathy and Age-related Macular Degeneration….

I also had the opportunity to be involved in important clinical trials by working in research for the Diabetic Retinopathy Clinical Research Network. I was able to investigate, experiment and "play" with different imaging tools, which at the time were still not available in Mexico, like the ultra-wide field fundus camera….

During the entire year I was also able to travel to different meetings and present the work that I was involved with during the fellowship… So far, I have published four papers as first author in peer-reviewed journals from the research done last year."

Report dated July, 2015

Dr. Hugo Quiroz-Mercado

Dr. Salcedo-Villanueva has now returned to Mexico City, where he is Attending Retina Specialist at the Asociación para Evitar la Ceguera en México and Professor at the National Autonomous University of Mexico.

"It will be exciting to watch as those who have received Helmerich Fellowships grow into being the leaders of ophthalmology in their countries."

William Felch, ICO Chief Executive Officer
www.icoph.org

Gene Therapy Study in Canine Model of Retinitis Pigmentosa

A recent study funded by the National Eye Institute (NEI), part of the National Institutes of Health, has determined for the first time that gene therapy in retinitis pigmentosa may be of some benefit even after there has been significant loss of cells in the eye. Scientists from the University of Pennsylvania and the University of Florida, Gainesville, demonstrated that gene therapy preserved vision (stopped the loss of photoreceptors in the retina) in dogs with naturally occurring, late-stage retinitis pigmentosa.

Using an adeno-associated virus (AAV), not known to cause any human diseases, to deliver healthy retinitis pigmentosa GTPase Regulator (RPGR) genes into retinal cells, the aim was for the genes to then produce the RPGR protein, which is necessary for maintaining the health of photoreceptors. Testing was done on dogs with a naturally occurring canine form of retinitis pigmentosa that appears among some mixed breeds.

Serial imaging suggested that the therapy halted the thinning of the retinal layer where photoreceptors are located. The structure of rod and cone photoreceptors was improved in the treated eye. Untreated eyes continued to lose retinal thickness and photoreceptor function. Even in dogs with later-stage disease, gene therapy halted the loss of retinal thickness and preserved the structure of surviving photoreceptors. Overall, the findings suggest that gene therapy halted disease-associated cell death for at least the length of the 2.5-year study. Before this study, gene therapy had only been shown to benefit animals when used in the earliest stages of the disease. Results of this study are published in *Proceedings of the National Academy of Sciences*.

The study's co-leaders were Gustavo Aguirre, DVM, PhD, and William Beltran, DVM, PhD, of the University of Pennsylvania. Study collaborators, Artur Cideciyan, PhD, and Samuel Jacobson, MD, PhD, also at the University of Pennsylvania, are carefully

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Dr. Gustavo Aguirre

Dr. William Beltran

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Retina Research Foundation is dedicated to the eradication of retina disease through programs in research and education.

My Eyes?

Answers to some of the most frequent questions doctors receive from their patients

Petros E. Carvounis, MD, RRF Board member, answers some common questions about prevention and treatment of age-related macular degeneration.

Dark Vegetables for Your Eyes

1. Can vitamins and food supplements prevent age-related macular degeneration (ARMD)?

What has been proven is that daily intake of the AREDS formula vitamins (vitamin C 500mg, vitamin E 400IU, beta carotene 15mg, zinc 80mg and cupric oxide 2mg) decreases the chances of losing "moderate" vision from 29% to 23% at five years in patients who already were highly predisposed to developing ARMD (already had lost vision from ARMD in the other eye or had a lot of the yellow deposits known as drusen). This alone should give pause for thought: put differently, without taking any supplements there is a 71% chance of avoiding 'moderate' visual loss, but taking these supplements increases the chances to 77%. One could argue that this is not worth the effort of taking two pills twice a day (1 pill twice daily if taking softgels) or 7,300 pills in the course of five years at a cost of $1,200. I find that most of my patients, however, choose to take AREDS vitamins as the annual cost is reasonable, but there is a definite modest beneficial effect.

Omega 3 Fatty Acid

The patients who really are wasting their money, however, are the ones who only have a few of the yellow deposits called drusen (95% of patients older than 45 have some drusen in their macula yet fewer than 5% of the population will develop ARMD). Such patients have a 1% chance of losing vision over the ensuing 5-7 years. This means that without taking supplements, their chances of avoiding 'moderate' loss of vision is 99%.

Smokers, and those that quit within the previous 10 years, should not take AREDS vitamins as beta carotene increases the risk of lung cancer. AREDS2 supplements are equally effective as AREDS vitamins and are appropriate for smokers/patients who quit smoking within the last 10 years.

Omega 3 fatty acid has been tested (in the AREDS2 study) and found not to be effective for prevention of progression to and visual loss from ARMD. Lutein and zeaxanthin are only effective in patients who consume few fresh fruits and vegetables, otherwise they offer no additional benefit.

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2. Can stem cell injection improve the vision in patients with retinal degeneration including age-related macular degeneration?

At this point in time, this is simply not true. Stem cells are cells that can multiply and produce a number of cell types found in the body, including the cells of the retina (for example photoreceptor cells) and the cells of the layer under the retina (RPE cells) that are lost in a number of retinal degenerations, including age-related macular degeneration. Great strides have been made that allow scientists to take cells from the skin or blood, isolate the stem cells and then grow them in the laboratory. In world-renowned laboratories, scientists have provided specific nutrients that coax them into developing into specific cell types including photoreceptor cells (retina cells) and RPE cells. One cannot simply inject these cells into the bloodstream or into the eye and hope that they will grow to replenish the ones the body has lost. This cannot occur for the simple reason that these cells will not find their way to the proper location by themselves. At best, they will be destroyed by the body and at worse they will multiply and create a tumor (cancer). There have been reports of centers in China or Mexico that do stem cell injections: the few patients that I have seen treated at such centers had stem cells taken from fat in their abdomen and injected into their eyes. What happened was predictable: the fat stem cells made some fat inside the eye that did not help these patients see better, at a cost of $10,000 that could instead have been donated to advance research that one day will help.

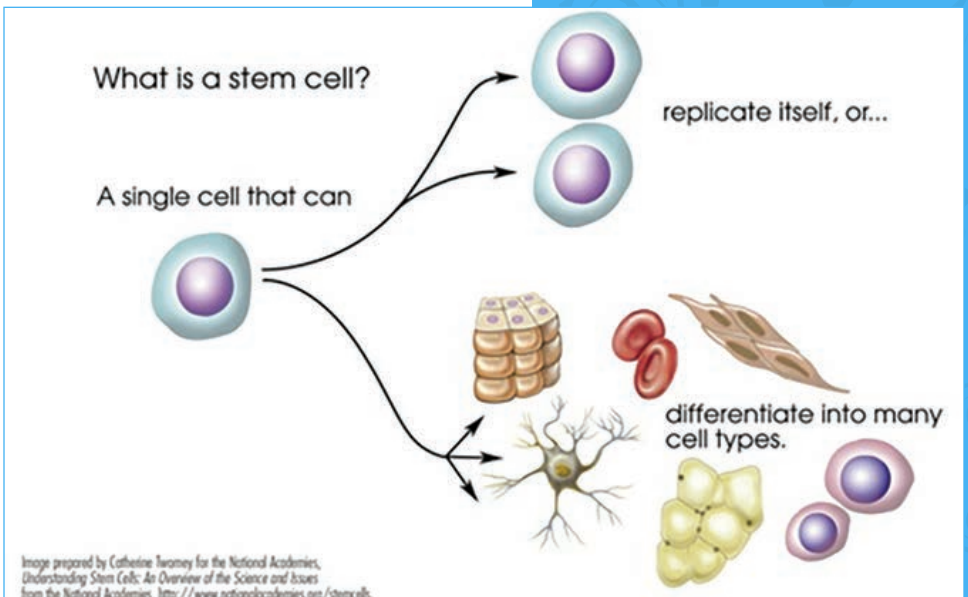

Image prepared by Catherine Twomey for the National Academies, Understanding Stem Cells: An Overview of the Science and Issues from the National Academies, http://www.nationalacademies.org/stemcells. Academic noncommercial use is permitted.

Figure 1: Definition of a Stem Cell

Definition of a Stem Cell

There is a lot of research being done to find out how we can get these stem cells that have been made to produce cells of the retina or RPE into the correct location (probably by developing a membrane of such cells that can be delivered with surgery under the retina). Research is also being done to find out how to ensure that these cells then go on to connect and form the correct circuits required for vision. I do not expect anything that can be used on patients routinely until about five years or so from now.

Petros E. Carvounis, MD, is an ophthalmologist specializing in macular degeneration, vitreoretinal diseases and surgery; Director, Vitreoretinal Fellowship Program; and Associate Professor of Ophthalmology, Cullen Eye Institute, Baylor College of Medicine.

Siberian Husky: A Breed that can have Retinitis Pigmentosa

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evaluating patients with RPGR mutations in preparation for a future clinical trial. Before being tested in people, additional research will be needed to assess its safety and the risk for potential toxicity.

Retinitis Pigmentosa

Retinitis pigmentosa is an inherited disease that causes degeneration of the retina. The most severe form of the disease causes night blindness in childhood and progressive loss of the visual field by age 45. Most people with the severe form of the disease carry mutations that cause loss of function of the RPGR gene. There is currently no cure. Both types of photoreceptors - rods and cones - are damaged. Cones allow for seeing fine detail and color, and rods allow seeing in dim light.

Source: NIH, National Eye Institute (NEI)
www.news-medical.net/news

Eye Safety for Sports

Eye injuries are the leading cause of blindness in children in the United States and most injuries occurring in school-aged children are sports-related. These injuries account for an estimated 100,000 physician visits per year at a cost of more than $175 million.

Ninety percent of sports-related eye injuries can be avoided with the use of protective eyewear. Protective eyewear includes safety glasses and goggles, safety shields, and eye guards designed for a particular sport. Ordinary prescription glasses, contact lenses, and sunglasses do not protect against eye injuries. Safety goggles should be worn over them.

https://nei.nih.gov/sports

Finding the Right Eye Protection

The following list summarizes recommended eye protection for a variety of sports. Visit your eye care professional to learn more about the most appropriate type of protective eyewear and to ensure proper fit.

Sports goggles with polycarbonate lenses: badminton, basketball, handball, racquetball, soccer, squash, tennis - doubles.

Sturdy street-wear frames with polycarbonate lenses: tennis - singles.

Polycarbonate face guard or other certified safe protection attached to the helmet for batting and base running; sports goggles with polycarbonate lenses for fielding: baseball.

Swim Goggles

Polycarbonate face guard on a helmet for batting and base running; sports goggles with polycarbonate lenses for fielding: softball.

Sturdy street-wear frames with polycarbonate or CR-39 lenses: bicycling, track and field.

Polycarbonate shield on helmet: football.

Swim goggles recommended: swimming.

Courtesy:
National Eye Institute, National Institutes of Health (NEI/NIH)

Sports Goggles

"Science is a self-correcting process. To be accepted, new ideas must survive the most rigorous standards of evidence and scrutiny."

Carl Sagan
American astronomer
(1934 – 1996)

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Additional memorials received will appear in the next issue.