Eivor and Alston Callahan, MD, Endowed Chair in Ophthalmology

The International Retinal Research Foundation (IRRF) has announced plans to endow a Chair in Ophthalmology at the University of Alabama at Birmingham (UAB) to honor its Founder and longtime leader, Dr. Alston Callahan and his wife, Eivor. Along with son, Dr. Michael Callahan, Loris Rich, and Dr. Charles Kelman, Dr. Callahan founded the Birmingham-based Foundation to further research that will someday provide a cure for blinding eye diseases such as macular degeneration. The IRRF is the culmination of his long career in eye healthcare, which began during World War II, when Callahan performed reconstructive eye surgery and became a pioneer in the field of ophthalmic plastic surgery.

Callahan served as the first chairman of the UAB Department of Ophthalmology and in 1963, founded the Eye Foundation Hospital, the first facility in Alabama dedicated to the care and treatment of the eye. UAB purchased the Hospital in 1997 and renamed it the Callahan Eye Foundation Hospital. Today, the Hospital is known around campus as, The Callahan.

The Callahan Chair will also honor his wife, Eivor, who supplied the support and strength that was needed for such accomplishments. The endowed chair will allow UAB to recruit a faculty member who is an expert in retina to pursue his or her research at UAB.
To read this paper in its entirety, please follow the link: www.impactjournals.com/oncotarget/index.

Improved cell metabolism prolongs photoreceptor survival upon retina-pigmented epithelium loss in the sodium iodate induced model of geographic atrophy, Marina Zieger and Claudio Punzo, Department of Ophthalmology, and Gene Therapy Center, University of Massachusetts Medical School. This study was conducted with IRRF support.

Age-related macular degeneration (AMD) is characterized by malfunction and loss of retinal-pigmented epithelium (RPE) cells. Because the RPE transfers nutrients from the chorio capillaris to photoreceptor (PR), PRs are affected as well. Geographic atrophy (GA) is characterized by malfunction and loss of RPE atrophy as both, rods and cones suffer from a sick and dying RPE. The findings suggest that activation of metabolic genes downstream of mTORC1 can serve as a strategy to prolong PR survival when RPE cells malfunction or die.

Retinal flat mount of mouse 4 weeks post sodium iodate injection showing in red surviving cones after loss of retinal-pigmented epithelium. The radial extent of retinal-pigmented epithelium damage can be inferred from the area the dark pigmented epithelium cells cover. Cones are identified by cone arrestin positive signal in red. (See related paper, “Oncotarget” above.)

Along with other leading vision research foundations, the International Retinal Research Foundation (IRRF) provided sponsorship for the Dowling-Werblin Symposium that presented highlights of the progress in retinal circuit analysis since 1969, its implications to neural information processing in the brain, and its application to retinal dysfunction and diseases, and how it helps to develop prosthesis and other methods to restore vision.

One of the optimal goals of brain research is to understand how neuronal networks respond to signals from the environment, and how individual neurons and synapses process information elicited by natural stimuli of the outside world. The retina is part of the brain as it embryonically derives from the neural tube. It is also the most accessible part of the brain because it is anatomically separate from the rest of the brain and it can be readily stimulated by its natural input – light. Our understanding on anatomical and functional neural circuitry of the retina far exceeds our knowledge of any other parts of the brain, and the tremendous success of functional analysis of retinal circuitry during the past 4–5 decades was inaugurated by the landmark papers in 1969: Organization of Retina of the Mudpuppy, Necturus maculosus I: Synaptic Structure John E. Dowling and Frank S. Werblin, J. Neurophysiology, 32, 315-338, 1969; Organization of Retina of the Mudpuppy, Necturus maculosus II: Intracellular Recording, Frank S. Werblin and John E. Dowling, J. Neurophysiology, 32, 339-358, 1969.

Dr. Claudio Punzo (middle) and his staff. Marina Zieger is pictured far left.

Dowling-Werblin Symposium: Half a Century of Retina Research; Neural Circuitry, Retinal Disorders and Restoration of Vision

ABOUT THE COVER PHOTO

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To read this paper in its entirety, please follow the link: www.impactjournals.com/oncotarget/index.php/journal-oncotarget&page=article&op=view&path%5B%5D=7330&path%5B%5D=20985

IRRF ANNUAL REPORT 5
Over four days in March 2016, the International Retinal Research Foundation partnered with the EyeSight Foundation of Alabama to bring free SupportSightSM Seminars on age-related macular degeneration to Huntsville, Birmingham, Montgomery and Mobile, Alabama. These seminars, conducted by the Macula Vision Research Foundation (MVRF), a Pennsylvania based non-profit organization, were open to the public and led by local retina specialists, low vision experts, other healthcare professionals and vision scientists.

Focusing on the latest information on advancements in treatment of AMD, these programs also provided practical strategies to enable the participants to live more comfortably and to maintain their physical and emotional well-being. The MVRF has been providing these seminars for over 15 years to more than 40,000 participants. Overall, 262 individuals attended from Alabama.

ABSTRACT:
Although retinal neurodegenerative conditions such as age-related macular degeneration, glaucoma, diabetic retinopathy, retinitis pigmentosa, and retinal detachment have different etiologies and pathological characteristics, they also have many responses in common at the cellular level, including neural and glial remodeling. Structural changes in Müller cells, the large radial glia of the retina in retinal disease and injury have been well described, that of the retinal astrocytes remains less so. Using modern imaging technology to describe the structural remodeling of retinal astrocytes after retinal detachment is the focus of this paper. We present both a review of critical literature as well as novel work focusing on the responses of astrocytes following rhegmatogenous and serous retinal detachment. The mouse presents a convenient model system in which to study astrocyte reactivity since the Müller cell response is muted in comparison to other species thereby allowing better visualization of the astrocytes. We also show data from rat, cat, squirrel, and human retina demonstrating similarities and differences across species. Our data from immunolabeling and dye-filling experiments demonstrate previously undescribed morphological characteristics of normal astrocytes and changes induced by detachment. Astrocytes not only upregulate GFAP but structurally remodel, becoming increasingly irregular in appearance, and often penetrating deep into neural retina. Understanding these responses, their consequences, and what drives them may prove to be an important component in improving visual outcome in a variety of therapeutic situations. Our data further supports the concept that astrocytes are important players in the retina’s overall response to injury and disease.
Baltimore, Maryland
Dr. Sethna joined the lab of Zubair M. Ahmed, PhD, in the Department of Otolaryngology – Head & Neck Surgery at the University of Maryland in March 2015, working as a research fellow. The main focus of research in Dr. Ahmed’s lab is Usher syndrome, an autosomal recessively inherited disorder characterized by deaf-blindness. In 2012, Dr. Ahmed’s lab reported mutation in Cib2 (an encoded calcium-binding regulatory protein that interacts with DNA-dependent protein kinase catalytic subunits and is involved in photoreceptor cell maintenance), causing Usher syndrome type I in humans. Since that time, Dr. Sethna has presented data revealing that Cib2 knockout mice have progressive loss of retinal function, and pathophysiology in the retinal pigment epithelium (RPE), including defects in phagocytosis. From this, Dr. Sethna hypothesized that loss of Cib2 leads to RPE Ca++ (calcium) imbalance that perturbs OS (outer segment) phagocytosis, RPE pathology and PR (photoreceptor) functional defects.

St. Louis, Missouri
Dr. Ban received his M.D. degree from Keio University School of Medicine, Tokyo, Japan in 2005. He then joined the graduate program at the prestigious Keio University Graduate School of Medicine, Tokyo, and completed his PhD in Cell Biology in 2014. His graduate research has been published in several high-impact peer-reviewed publications including Experimental Gerontology, Experimental Diabetes Research and the Journal of Neuroscience. Under the mentorship of Rajendra Apte, PhD, Director of Translational Research at Washington University, Dr. Ban is using his experience to conduct molecular research, as well as translate discoveries into the clinical realm as part of his vitreoretinal practice.

“I have no doubt that Norimitsu will excel as a clinician scientist, who in addition to his clinical expertise, will provide the bridge to translate fundamental discovery from the bench to the bedside,” said Dr. Apte.
Dr. Dubey attended Madurai Kamaraj University in Madurai, India, where he received a Master in Science degree and later completed a fellowship and received his PhD from Aravind Medical Research Foundation, also in India. Dr. Dubey's current focus is to attain experience in the emerging field of epigenetics, while supporting his interest in ocular biology. He is investigating the epigenetic regulation and transcriptional repression mediated through histone deacetylases in aging retina and age-related macular degeneration (AMD).

The groundwork for the proposed research was laid by identifying the altered expression of histone deacetylases in advanced dry AMD. Dr. Dubey's preliminary data indicates the role of these altered regulators in autophagy in retinal pigment epithelium. He feels his background in the field of ocular genetics and epigenetics, coupled with vast experimental skills, will prove to be an asset for the present research project. The proposed project aims to open translational avenues to advance dry AMD therapeutics while exploring the role of this epigenetic phenomenon in the aging retina.
The International Retinal Research Foundation
Grants 1998 – Present

Grand Total All Years $18,019,054
Various Institutions Include all grants less than $75,000
No one disputes the importance of scientific research into the causes and cures of the diseases that plague our society, however, in focusing on these aspects of the problem, the needs of those who are afflicted are sometimes overlooked. During 2016, the IRRF supported a unique program that provides an urgently needed service not traditionally offered to patients with vision diseases.

UAB Connections (University of Alabama at Birmingham), is an expert-led health-education support group for patients with various eye conditions, including retinal specific diseases. Through this clinical service, UAB Connections helps patients and their families beyond medical and surgical treatment by providing skills to help them cope with the ongoing challenges of living with a vision impairment. The support group meets monthly at the Callahan Eye Hospital to hear from experts in the fields of Ophthalmology, low vision and rehabilitation during a structured discussion-based presentation. Additionally, patients, as well as their families, are engaged through monthly activities within the community that promote recreational and social interaction to prevent isolation, depression and withdrawal following vision loss.

One such activity funded by IRRF, and in part by the UAB Vision Sciences Research Center (VSRC), is ‘Dinner in the Dark,’ a dining experience at Rojo Restaurant that offers enhanced sensitivity and understanding toward those with impaired vision. In a controlled setting via simulation goggles, UAB ophthalmologists and optometrists, residents, and technicians, along with friends and families of the Connections member group, briefly experienced what it is like to live with a vision impairment. Sandra Blackwood, IRRF Executive Director, and Charlotte Bowers, IRRF Director of Operations, attended the event to get a firsthand understanding for how an everyday activity as eating can become a challenge. "It was very intimidating and a little scary at first,” remarked Blackwood. “Until you become more confident, you are totally at the mercy of someone else, and that can be hard to accept.”

Another aim of UAB Connections, is to provide community education outreach efforts on retinal and other eye diseases. Education efforts are conducted to inform UAB residents/doctoral students, physicians, technicians, community leaders and the public general on what it is like to live with a vision impairment and how to adapt.

For more information on UAB Connections, contact Molly Cox at mollycox@uabmc.edu or (205) 488-0778.
2016 Lasker Awards

September 2016

The Albert and Mary Lasker Awards continue to be an integral component of the IRRF’s collaboration with the Albert and Mary Lasker Foundation. These Awards provide support to outstanding scientists in the medical field by recognizing the contributions made through major advances in the understanding, diagnosis, treatment and prevention of human disease. Along with this support, the two Foundations have established the Lasker/IRRF Initiative for Innovation in Vision Science. For more information about the Awards Program, and to learn about the Lasker/IRRF Initiative for Innovation in Visions Science, please go to: www.laskerfoundation.org.

2016 Lasker Awards

The 2016 Albert Lasker Basic Medical Research Award honored three physician-scientists for their discovery of the pathway by which cells from human and most animals sense and adapt to changes in oxygen availability—a process essential for survival.

The 2016 Lasker-DeBakey Clinical Medical Research Award was presented to Ralf F. W. Bartenschlager, Charles M. Rice and Michael J. Sofia for developing a system to study the replication of the virus that causes hepatitis C and used this system to revolutionize the treatment of this chronic, often lethal disease.

2016 Lasker-Koshland Award for Special Achievement in Medical Science honored Bruce M. Alberts for his fundamental discoveries in DNA replication and protein biochemistry; for visionary leadership in directing national and international scientific organizations to better people’s lives; and for passionate dedication to improving education in science and mathematics.
Michael A. Callahan, MD, has served as President since 2004 and gives generously of his time. Since 1998, Dr. Callahan has held a faculty position as Professor of Ophthalmology in the Department of Ophthalmology at the University of Alabama at Birmingham (UAB), and teaches the intricate surgical procedures of phacoemulsification and intraocular lens insertion. In addition, Dr. Callahan lectures on ophthalmic plastic surgery. Dr. Callahan is also very involved in providing ophthalmic care in the U.S. and countries worldwide, where medical care is not readily available.

V. Hugo Marx, III, serves as Treasurer and has been a member of the IRRF Board since 2004. Mr. Marx operates several corporations, which represent various industries, including health care, investment banking and venture capital. Through his numerous businesses, Mr. Marx has provided charitable donations as medical supplies, food and support items used in multiple, extreme emergency situations in and outside the U.S.

John S. Parker, MD, serves as Vice President while devoting himself to private ophthalmology practice and teaching responsibilities in the UAB Department of Ophthalmology where he trains ophthalmology residents and donates time and expertise caring for indigent patients. Dr. Parker has served as Director of the Corneal Service and as Director of the Residency Training Program in the UAB Department of Ophthalmology.

Paul S. Sternberg, Jr., M.D., serves as Director of Research Funding for the Foundation in addition to his many other responsibilities at Vanderbilt University in Nashville, Tennessee, where he is Associate Dean for Clinical Affairs and Associate Vice Chancellor for Adult Health Affairs at the Vanderbilt School of Medicine. Dr. Sternberg also serves as professor and chairman of the Department of Ophthalmology and the Vanderbilt Eye Institute. With a special interest in age-related macular degeneration, Dr. Sternberg oversees a cell biology and biochemistry laboratory that carries out studies into the causes of the disease.

Larry A. Donoso, M.D., Ph.D., J.D., serves as Director of Research Education and heads up the Scholar Award program at the Foundation. Dr. Donoso has over four decades of bench and clinical research experience, which adds an important component to the combined talents of the IRRF Board of Directors. Holding degrees in chemistry, experimental biology, biochemistry/biology, medicine, and law, allowed Dr. Donoso to serve as Scientific Director when the Foundation was newly formed and has been a steadfast member of the board for 15 years.


The Lasker/IRRF Initiative for Innovation in Vision Science is a ten-year collaboration, launched in July 2008, between the Albert and Mary Lasker Foundation (Lasker) and the International Retinal Research Foundation (IRRF). The Initiative was designed to identify knowledge gaps in vision research and propose innovative strategies to accelerate the discovery of sight-saving treatments and methods to prevent diseases of the eye, especially retinal degenerative diseases, using novel scientific, engineering and technological approaches. In late 2014, the Initiative’s Joint Advisory Board decided that recent scientific advances provided a compelling opportunity to examine the scientific challenges in the field of amblyopia and to propose new approaches and novel treatments for this condition. Amblyopia is a disorder that results in varying degrees of monocular, or occasionally binocular, vision impairment, mainly in children; if not successfully treated, it can lead to permanent vision impairment for life. Its etiology and a precise definition have long defied science’s best efforts, but we do know that risk factors for amblyopia include strabismus (crossed eyes), anisometropia (asymmetric eye focus), and deprivation (lens or lid defects). Amblyopia affects 1 – 3% of the population, though estimates vary widely because diagnostic and screening tools may not always be sufficiently comprehensive or available to all populations. How and when to treat amblyopia remains an ongoing challenge, and even whether innovative technologies can restore improved visual function in patients who were not treated when young remains an open question.
Today’s scientists play a crucial role in the universal struggle against debilitating eye diseases, but they need financial funding to facilitate and sustain their efforts. Since 1998, the IRRF has granted more than $18 million in support of scientific investigations targeting all structures of the human eye, with emphasis on finding the causes, prevention and cure of degenerative diseases. If you would like to help with this challenge, please send your tax deductible contribution to:

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