The Alston Callahan, MD, FACS Endowment Fund Established

SAN FRANCISCO, CA

The IRRF has partnered with the American Academy of Ophthalmology (AAO) to establish the Alston Callahan, MD, FACS Endowment Fund in support of ophthalmic education and cultural exchange. In addition to founding the Callahan Eye Foundation Hospital at the University of Alabama at Birmingham and the IRRF, Dr. Callahan was a pioneer in ophthalmic plastic surgery and a lifelong member of the AAO. Established in honor of Dr. Callahan, income from the endowment will support the AAO’s Rotary Club Host Project and its goal to provide ophthalmologists in developing countries with educational and cultural opportunities in the United States. The knowledge, skills and techniques these physicians obtain during their visit directly affect the quality of eye care they provide to patients within their community once they return home. (continued on page 6)

Visiting Ophthalmologists came from Pakistan, Tanzania, Central African Republic, Iraq, New Guinea, and Nigeria, and were joined by sponsors and hosts at the International Welcome Luncheon held in San Francisco, California.

Over last summer, two workshops were conducted in Woods Hole, Massachusetts (Vol. 5, No. 2, IRRF Newsletter), from which significant challenges were identified by a broad spectrum of research scientists, including neurobiologists, molecular biologists, biophysicists, biochemists and clinical experts on retinal and other neurodegenerative diseases. Two sets of topics (one from each workshop) were refined and clarified as six critical issues that are impeding research progress.

All members from the summer workshops, as well as scientists with expertise that could provide additional knowledge were invited to attend a follow-up meeting at the Howard Hughes Medical Institute’s (HHMI) Janelia Farm Research Campus on February 28 – March 3, 2010, where the following areas were discussed:

- Astrocytes and other glial cells in glaucoma and other retinal diseases
- Etiology of Glaucoma
- Primary Physiological/Visual Defects in Glaucoma
- Classification of Glaucomas
- Animal Models of Glaucoma
- Therapies

The participants examined these key areas in half-day targeted sessions and outlined a plan to focus on research that would surmount hurdles hindering progress in this field. John Dowling, PhD, as Chair of the Initiative, directed the four scientific sessions that were followed by two targeted sessions and a report session.

(This is an ongoing IRRF-funded project sponsored in collaboration with the Albert and Mary Lasker Foundation, New York, New York.)

“Red Nessie,” a sculpture by Delos Van Earl, sits on water’s edge at Janelia Farm Research Campus.
(Photo courtesy of Larry Donoso)

“IT IS A BUILDING ABOUT NATURE. NATURE IS THE CENTERPIECE OF RESEARCH AT JANELIA FARM, AND THE BUILDING follows that idea.”
Rafael Viñoly, Architect.
(Photo courtesy of Larry Donoso)
March 1, 2010

SESSION 1 – Moderator
Ben Barres, MD, PhD
Serge Przedborski, MD, PhD
The Role of Glial Cells in Motor Neuron Degeneration
Hemali Phatnani, PhD
Mutant Gene Expression of Co-cultural Mouse Embryonic Stem Cells in Motor Neuron Degeneration
Adriana Di Polo, PhD
Identification of Signaling Cascades as Possible Mediators of Retinal Ganglion Cell Loss
Ernst Tamm, MD
Nonin Initiates Signal Cascade in Müller Glia that Protects Retinal Ganglion Cells from Excitotoxic Damage
Brad Fortune, OD, PhD
Electrophysiology Abnormalities in Glaucoma that Might Regulate Early Optic Nerve Head Astrocyte Dysregulation
SESSION 2 – Moderator
Len Levin, MD, PhD
Neeraj Agarwai, PhD
The Pros and Cons of Various Animal Models for Glaucoma
Gareth Howell, PhD
Development of Tools to Genetically Manipulate DBA/2J Mice for the Study of Glaucoma
Alejandra Bosco, PhD
Use of a Novel Acute Model to Examine the Progression of Axonopathy in Early Glaucoma
Sansar Sharma, PhD
Effects of Elevated IOP on Cellular Charges in the Glaucomatous Retina
Y. Joyce Liao, MD, PhD
Use of Intravenous Alpha-B Crystallin to Treat Photo-chemical Thrombosis of Ischemic Optic Neuropathy
Elaine Johnson, ScD
Rat Glaucoma Models, Relevance and Application

March 2, 2010

Targeted Sessions-Part I
Drs. John/Howell and Lütjen-Drecoll
Animal Models of Glaucoma
Drs. Levin and Masland
Primary Physiological/Visual Defects in Glaucoma
Drs. Barres and Dowling
Roles of Astrocytes

March 3, 2010

Targeted Sessions-Part II
Drs. Lütjen-Drecoll/John/Howell
Classification of Glaucomas
Drs. Masland and Levin
Etiology of Glaucoma
Drs. Dowling/Barras
Reactive Astrocytes and Retinal Disease
Dr. Alan Laties
Therapies

March 2, 2010

SESSION 4 – Moderator
Larry Donoso, MD, PhD
Mark Ellisman, MA, PhD
Collaborative Research on Glaucoma
Steven Fisher, PhD/Geoffrey Lewis, PhD
Retinal Detachment: a Method for Studying Wide-Scaled Reactivity of Retinal and Optic Nerve Head Astrocytes
Presentation by Dr. Kevin Moses: HHMI’s Janelia Farm

March 3, 2010

Presentation of Session Reports
The Rotary Club Host Project, a partnership between Rotary Clubs and the AAO, came about in an effort to reduce the incidence and prevalence of avoidable blindness. The World Health Organization estimates that 37 million people are blind, and another 124 million have severe impairment, with 90% of those affected living in economically developing nations. More disturbing is that 75% of the blindness and visual impairment is unnecessary; it is either curable or could have been prevented. Somewhere in the world, someone goes blind every 5 seconds and a child goes blind every minute.

The IRRF became involved with the Rotary Club Host Project in the fall of 2009 after a donation to sponsor, Youfegan Mathurin, MD from the Central African Republic. Dr. Mathurin was one of six ophthalmologists who traveled to the United States to share in professional, educational, cultural and social experiences within a local community, followed by attendance at the 2009 Joint Meeting of the American Academy of Ophthalmology and the Pan American Association of Ophthalmology in San Francisco, California. (From left: Rotarian Host and Project Chair, Kenneth Tuck, MD; IRRF President, Michael Callahan, MD; Youfegan Mathurin, MD, sponsored by the Roanoke, VA Rotary Club and the IRRF; IRRF Executive Director, Sandra Blackwood.)

During the meeting, guest ophthalmologists were provided many educational opportunities, while developing relationships with colleagues and representatives of ophthalmic industry. Contacts with eye care service organizations were also established.

The IRRF recently joined individuals and local businesses in support of the Birmingham VisionWalk held at Homewood Central Park for its inaugural run in our city. In addition to funds support, Charlotte Bowers, IRRF Assistant Director for Operations, and her sons participated in the event, helping to raise approximately $52,786 for the Foundation Fighting Blindness. “We had a lot of fun and it was nice to do something as a family for an event so worthy,” said Bowers.

Sponsorship of local causes allows our Foundation to assist in fund-raising events that make a positive impact on the Birmingham community.

The SIG, “Cholesterol and lipoproteins in retinal health and age-related maculopathy: update and future directions,” was organized by James T. Handa, MD, Johns Hopkins Wilmer Eye Institute, and Dr. Curcio, and attended by approximately 300 people on May 2, 2010. This year’s SIG was especially timely due to the April 12, 2010 publication of two Proceedings of the National Academy of Sciences (PNAS) papers showing an association of lipid processing genes with age-related macular degeneration (ARMD) and the April 23, 2010 publication of a PloSOne.
paper showing that lipids were the single largest component in drusen. Highlighted were the unique aspects of retinal cholesterol homeostasis that are relevant to the large age-related deposition of cholesterol in Bruch’s membrane, experimental approaches and model systems for further work, and important parallel mechanisms learned from research in atherosclerotic cardiovascular disease. Ultimately, it is expected that tools and therapies devised for cardiovascular disease can be re-purposed for modulating lesion formation and clearance in ARMD patients. This strategy is dependent on a sound scientific basis that the SIG participants are in the process of providing.

Mark E. Kleinman, MD, the 2008 Charles D. Kelman, MD Postdoctoral Scholar,

Presented at the Poster Session at the 2010 annual meeting of the Association of Research in Vision and Ophthalmology (ARVO). Entitled Molecular Mapping of Toll Receptor Mediated Retinal Pigment Epithelial Cell Responses with Functional Genomics, the poster outlined findings from a study supported by the IRRF that will hopefully lead to publication. Dr. Kleinman, University of Kentucky, Chandler Medical Center, Lexington, Kentucky, received the 2008 Kelman Award for his project, The Heterogeneous Immunovascular Effects of siRNA in the Posterior Segment. Kleinman’s research at New York University, where he received his medical education, contributed to the field of endothelial stem/progenitor cell biology and anomalous vascular growth, in particular with the enigmatic clinical presentation of proliferating infantile hemangioma, for which he was awarded the Weston Research Grant. These findings were published in a wide array of scientific journals and include a seminal first-authored manuscript on hypoxia-induced mediators of progenitor cell trafficking in infantile hemangioma in the AHA publication, Atherosclerosis, Thrombosis, and Vascular Biology, which featured the article on the cover of the issue.

Christine Curcio, PhD Named ARVO 2010 Gold Fellow

The Association for Research in Vision and Ophthalmology (ARVO) has announced that Christine A. Curcio, PhD, a professor in the University of Alabama at Birmingham (UAB) Department of Ophthalmology, is among this year’s class of distinguished Fellows. Curcio has been elevated to Gold Fellow in recognition for her ongoing accomplishments, leadership, and contributions to the Association. ARVO’s two levels of Fellows, Gold and Silver (Curcio was named a Silver Fellow in 2009), are determined by a rigorous point system. It is anticipated that Fellows will continue to serve as role models and mentors for individuals pursuing careers in vision and ophthalmology research and to further ARVO’s vision of facilitating the advancement of vision research and the prevention and cure of disorders of the visual system worldwide.

Dr. Curcio’s research focuses on aging and age-related macular degeneration, a major cause of vision loss in the elderly that affects more Americans than cancer or Alzheimer’s disease.
Joanna Crook, a PhD candidate from the University of Washington, received the Ramon F. Dacheux II Memorial Travel Award based on her abstract presentation, "Excitatory Synaptic Conductances Mediate 'Blue-Yellow' and 'Red-Green' Opponency in Macaque Monkey Retinal Ganglion Cells." The findings were presented during one of the poster sessions at the annual meeting of the Association for Research in Vision and Ophthalmology (ARVO).

The Dacheux Travel Award, funded by a donation from the IRRF and presented through the ARVO Foundation, provides travel support for student researchers conducting basic science research in order that they may report their work at the annual meeting. Dr. Dacheux made numerous contributions to the understanding of retinal function while at the University of Alabama at Birmingham (UAB) and freely shared his knowledge, and was involved in the formation of the IRRF.

Jayakrishna Ambati, MD Awarded Cogan Award:

Jayakrishna Ambati, MD of the University of Kentucky received the 2010 Cogan Award for his exceptional contributions to the understanding of the role of innate immune mechanisms and macrophages, particularly in angiogenesis. Dr. Ambati established that macrophages can be anti-angiogenic. His work advanced the potential role of macrophages in the understanding of the mechanisms and treatment of age-related macular degeneration. Dr. Ambati presented the Cogan Award Lecture, "Age-Related Macular Degeneration and the Other Double Helix," at the ARVO annual meeting in Fort Lauderdale, Florida. (Dr. Ambati, an IRRF-sponsored scientist for his study, Molecular mechanisms of subretinal debris removal in the Ccr2-/-, nominated and served as mentor to the 2008 Charles D. Kelman, MD Postdoctoral Scholar, Mark E. Kleinman, MD.)

Justine R. Smith Named to ARVO Board of Trustees

Justine R. Smith, MBBS, PhD, FARVO, Oregon Health & Science University, has been elected to the ARVO Board of Trustees, Immunology/Microbiology Section. Dr. Smith receives IRRF research funding for her project, Molecular Mediators of Proliferative Diabetic Retinopathy.
Jungyeon Won, PhD Receives the 2010 Alston Callahan, MD Postdoctoral Scholar Award:

Dr. Jungyeon Won has been named the 2010 Callahan Scholar in support of her project, The Role of Membrane Frizzled Related Protein (Mfrp) and Complement 1q and tumor necrosis factor-related protein 5 (C1qtnf5) in the Retina. Currently working in The Jackson Laboratory in Bar Harbor, Maine, Won was nominated by Patsy M. Nishina, PhD. Dr. Won joined Dr. Nishina’s laboratory from the Department of Biological Sciences, Korea Advanced Institute of Science and Technology, Daejon, South Korea, where she studied apoptotic pathways in in vitro cell culture systems. The Callahan Award of $35,000 will allow Dr. Won to complete the studies she has initiated and will further her transition to independence.

Michael Lovelace, PhD Named the Charles D. Kelman, MD Postdoctoral Scholar for 2010:

Michael Lovelace, PhD, University of Sydney, Australia, has been named the 2010 Charles D. Kelman, MD Postdoctoral Scholar in support of his study, Elucidating the role of astrocytes in glaucoma, nominated by Tailoi Chan-Ling, PhD, Professor Neurobiology and Vision Science. After receiving his PhD from Deakin University, Victoria, Australia, Dr. Lovelace gained extensive postdoctoral experience in the laboratory of leading developmental neurobiologist, Professor Max Bennett, where he examined stress responses of astrocytes as a model of long-term brain alterations in schizophrenia. In 2009, Dr. Lovelace received the Dintenfass Memorial Plaque for the most interesting/innovating Rebecca Cooper Medical Research Foundation grant proposal. Dr. Lovelace is described as an excellent young researcher who supervises and mentors multiple research students and works hard to set an example for the younger investigators. In the coming year, Dr. Lovelace will work alongside Dr. Chan-Ling while collaborating with Dr. Claude Burgoyne in the United States, for an opportunity to work with the elegant primate experimental model of glaucoma developed by the Burgoyne laboratory.
Peter Barabas, PhD, Moran Eye Center, The University of Utah, Salt Lake City, received the Charles D. Kelman, MD Postdoctoral Scholar Award in 2009 for his proposed study, *Photoreceptor calcium homeostasis in rod-cone dystrophies*. The main focus of Dr. Barabas’s work is the new class of calcium-permeable ion channels in the retina that have a high likelihood of being involved in many, if not most, retinal diseases. These TRP (transient receptor potential) channels are currently one of the hottest topics in cellular neuroscience, having been implicated in a range of serious brain diseases from Alzheimer’s to neuropathic pain, hyperalgesia and mucolipidosis. More than 20 TRP channels have been identified to date with each cell expressing several types/classes. However, neither location nor function of any TRP channel in the retina is known, mainly because the field is so new.

Dr. Barabas received his B.Sc. in Biology from Warsaw University, Poland in 1996 and his PhD in Biochemistry at Eötvös Loránd University of Sciences in Budapest, Hungary in 2005. His thesis focused on measurements of glutamate release from rodent and amphibian retinas with a significant component involving the study of the effects of type VI phosphodiesterase inhibitors such as zaprinast on light responses and synaptic release of glutamate at photoreceptor synapses. Dr. Barabas was nominated by Dr. David Krizaj, an expert in the field of photoreceptor physiology at the University of Utah, Moran Eye Center.

Peter Barabas, PhD, Recipient of the 2009 Charles D. Kelman, MD Postdoctoral Scholar Award:

Dr. Barabas attended the 2010 annual meeting of the Association for Research in Vision and Ophthalmology (ARVO) where he participated in a poster session outlining his latest findings.

Survey of Ophthalmology recently identified an article authored by IRRF founder Alston Callahan, MD, and IRRF Director of Research Education Larry Donoso, MD, as its top cited article. The article, *The role of inflammation in the pathogenesis of age-related macular degeneration*, was published in 2006 and was included in Survey’s Top 10 Cited list.

**PUBLICATIONS BY PETER BARABAS**

The Journal of Physiology, “*Glutamate-induced internalization of Ca$_{\text{L}}$,3 L-type $\text{Ca}^2+ $ channels protects retinal neurons against excitotoxicity.*” March 15, 2010 Vol. 588, Number 6; p. 953-966. www.jp.physoc.org (Archives).


BECOME A BENEFACtor:

How you can help…

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 $9.2 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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