

RETINA
RESEARCH
FOUNDATION
2012 annual report



Jacquie Royce and Hunter Martin



Dr. Alice McPherson and Emmett Humble



John Dawson



Dr. Jim Key, Dr. Art Willis and Dr. Bernie Hicks



Bruce Mack and Rich Walton

Cover photo courtesy of Arnold E. Ruoho, PhD

The various layers of the retina are identified by the general nuclear stain DAPI (blue). The layers of the retina shown in the photo are (top to bottom): the Inner Segment of the photoreceptor cells (RED showing Kv 2.1); the Outer Nuclear Layer (ONL- some S1R shown in green); the Outer Plexiform Layer (OPL- which are the synapses); the Inner Nuclear Layer (INL - substantial S1R shown in green); the Inner Plexiform Layer (IPL - synapses); the Ganglion Cell Layer (strong green showing the S1R).

Dr. Ruoho believes that the S1R is critical in reducing the oxidative stress in retinal cells and plays an important role in reducing retinal neurodegeneration.

Retina Research Foundation

Annual Report 2012

Table of Contents

Chairman’s Message	1
Overview of Research.....	2-3
Collaborating Organizations	4-5
Site Visit to Madison, WI: McPherson ERI	6-8
Named and Basic Research Projects.....	9-13
Established Research Awards.....	14-16
Research Chairs and Professorships	17-19
International Fellowships.....	20
Research Initiatives	21
Financial Summary	22-23
Officers and Boards.....	24-25
Contributors	26-33
In Memoriam	34



Retina Research Foundation Board of Directors



Dr. Ben Orman and Dr. Alice McPherson



Keith Humble, Emmett Humble and Deral Humble



*Kathy Orton, Nancy Japhet, Helen Fourmy
and Suzanne Miller*

Chairman's Message



Frank K. Eggleston, DDS

Dear Friends,

Beginning in 1969 and continuing to the present day, RRF has worked tirelessly to advance our stated mission: “to reduce retinal blindness worldwide by funding programs in research and education.” The goal has always been ultimately to speed the pace of bringing scientific discoveries in the laboratory to the clinical level, resulting in better disease prevention, new treatments, and improved patient care. Scientific studies related to diagnosis and treatment of disease (clinical and translational science) will always be enthusiastically welcomed and will generate much interest with the public.

With a view to the end result at the clinical level, we never want to lose sight of the very beginning of the discovery process – basic science research. Basic science supplies the crucial puzzle pieces in understanding both healthy and diseased states at the molecular and cellular level. For example, studying the mechanisms of cell development, growth, and survival provide key insights.

The knowledge gained from basic science research may not immediately produce results applicable to patient care, but importantly adds to our understanding of the changes in cells and molecules that cause disease. With each new discovery comes new avenues for research that can then be pursued in additional studies or by other investigators. The framework of knowledge expands, and like a super highway this always-under-construction infrastructure facilitates the smooth transport of ideas and concepts across disciplines and across international boundaries.

In science, there is no one right way to the answers. RRF believes in a multi-faceted approach of basic science, clinical and translational research. In reading this annual report, we hope you will notice the broad scope of projects that make up our 2012 research and education program.

We invite you to join us in our journey toward building a world free of blindness. It's a noble cause, and we can confidently predict that each passing year will bring new hope as we continue to support our wide variety of programs in research and education.

With gratitude,

Frank K. Eggleston, DDS

Frank K. Eggleston, DDS
Chairman

Overview of Research - 2012

Retina Research Foundation supports an exemplary variety of programs in retina research around the world. The following is a brief recap of RRF research supported in 2012, which illustrates the wide scope of RRF activities.

RRF Pilot Study Grants – Investigation of New Research Topics

Baylor College of Medicine, Houston, TX

- Samuel Wu, PhD - Kayser Research Project
- Benjamin Frankfort, MD, PhD - Mueller Research Project
- Milan Jamrich, PhD - Lawrence Research Project
- Rui Chen, PhD - Manning Research Project
- Graeme Mardon, PhD - Miller Research Project
- Richard Hurwitz, MD - Wilson Research Project
- Ramon Font, MD – Basic Research Project

UT MD Anderson Cancer Center, Houston, TX

- Louise Strong, MD - Humble Research Project

Texas A&M Health Science Center, Temple, TX

- Lih Kuo, PhD - Gueymard Research Grant

University of Wisconsin, Madison, WI

- Nansi Jo Colley, PhD - Murfee Macular Degeneration Project
- Barbara Klein, MD, MPH - Basic Research Project
- Leonard Levin, MD, PhD - Basic Research Grant

RRF Cox Macula Society Research Grant – administered by The Macula Society

- Stephen Tsang, MD, PhD – Harkness Eye Institute, Columbia University, New York, NY
- Stephen Jae Kim, MD – Vanderbilt Eye Institute, Nashville, TN

Research Chairs – Ongoing Proven Research Projects

University of Wisconsin, Madison, WI

- Akihiro Ikeda, PhD - Helmerich Chair, Assoc. Director, McPherson Eye Research Institute
- Nader Sheibani, PhD - RRF Research Chair
- David Gamm, MD, PhD - Humble Distinguished Director, McPherson Eye Research Institute
- Arthur S. Polans, PhD - Murfee Chair, McPherson Eye Research Institute

Baylor College of Medicine, Houston, TX

- RRF Research Chair - Yet to be named

Research Professorships – Ongoing Proven Research Projects

University of Wisconsin, Madison, WI

- Arnold E. Ruoho, PhD - Gamewell Professor, McPherson Eye Research Institute
- Nansi Jo Colley, PhD - Matthews Professor, McPherson Eye Research Institute
- Aparna Lakkaraju, PhD - Brown Professor, McPherson Eye Research Institute

Overview of Research - 2012

Established Awards – Awards Recognizing Lifetime Achievement

RRF Award of Merit – presented by The Retina Society – Washington, DC – Oct. 6

Richard F. Spaide, MD – Vitreous-Retina-Macula Consultants, New York, NY

RRF Kayser International Award – presented by International Society for Eye Research (ISER) – Berlin, Germany – July 24

Robert E. Anderson, MD, PhD – Dean McGee Eye Institute, Oklahoma City, OK

RRF Pyron Award – presented by American Society of Retina Specialists (ASRS) – Las Vegas, NV – August 26

Daniel F. Martin, MD – Cole Eye Institute, Cleveland, OH

CL Schepens MD/AAO Award – presented by American Academy of Ophthalmology (AAO) and Schepens International Society (SIS) – Chicago, IL – November 9

Alan C. Bird, MD – Moorfields Eye Hospital, London, England

RRF Gonin Lecturer – presented by Club Jules Gonin - Reykjavik, Iceland – June 22

Professor José-Alain Sahel – Institut de la Vision – Paris, France

RRF Gonin Medalist – presented by ICO with Club Jules Gonin

Will be presented again in 2014

International Fellowships – Advanced Subspecialty Training

ICO/Helmerich International Fellowships - administered by International Council of Ophthalmology Foundation (ICOF)

Henry E. Nkumbe, MD - from Madagascar to the Eye Foundation Hospital in Lagos, Nigeria, and the Jules Stein Eye Institute at the University of California, Los Angeles

Pukhraj Rishi, MD - from Chennai, India to Wills Eye Institute, Philadelphia, PA

Gillingham Fellowships - administered by Pan-American Association of Ophthalmology (PAAO)

Tammy Osaki, MD - from Brazil to Harvard Medical School, Massachusetts Eye and Ear Infirmary, Boston, MA

Daniel Lavinsky, MD - from Brazil to Stanford University, Stanford, CA

Research Initiatives – Educational and Travel Scholarships

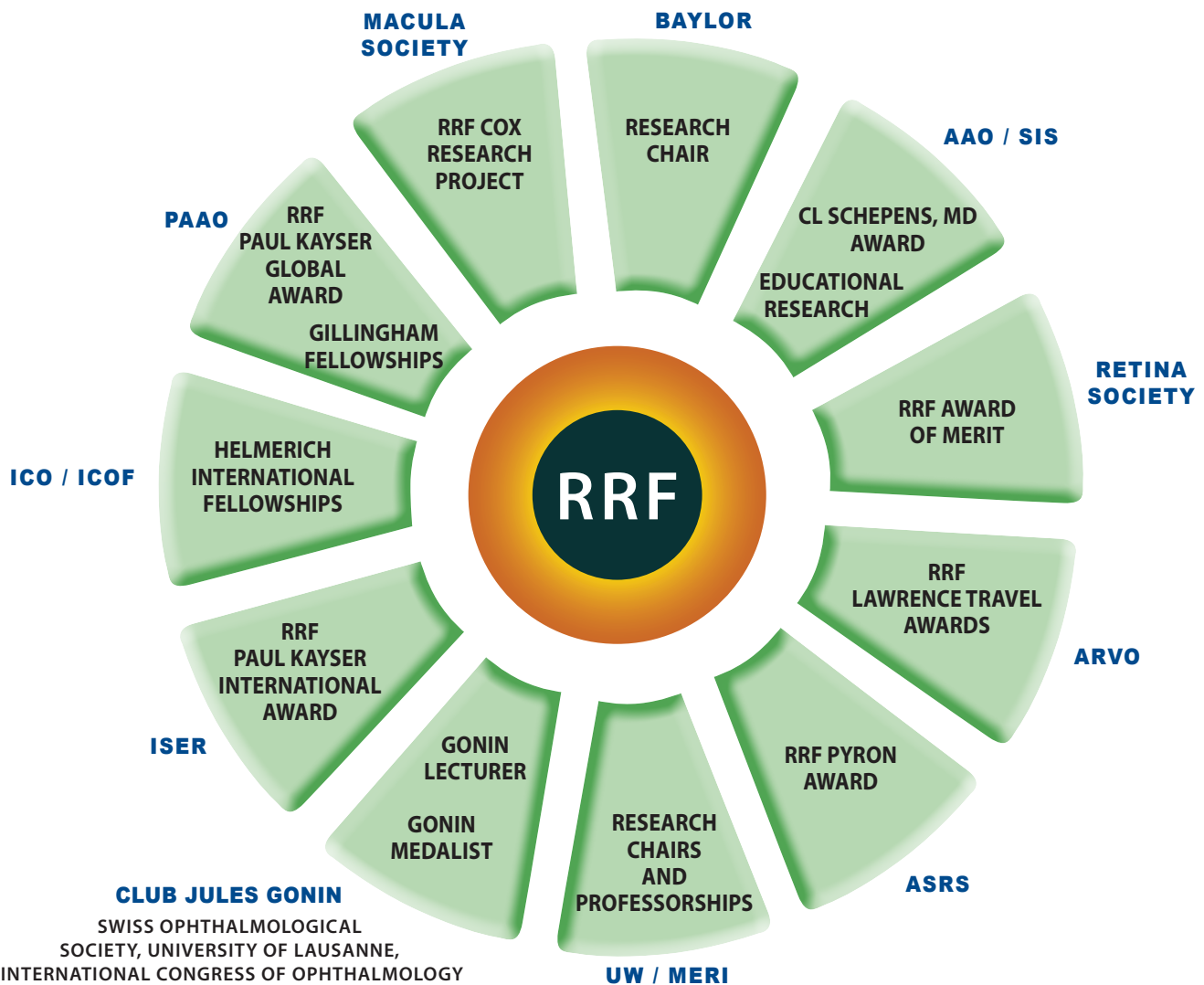
AAO Educational Trust Fund – administered by The Foundation of the American Academy of Ophthalmology (FAAO)

Retina-related educational research programs for clinical and basic science

RRF Lawrence Travel Scholarships – administered by The Association for Research in Vision and Ophthalmology (ARVO)

Twenty-four vitreoretinal scientists representing schools in sixteen states traveled to the ARVO Annual Meeting to present their scientific research.

COLLABORATING ORGANIZATIONS



COLLABORATING ORGANIZATIONS	AWARD	DATE OF FIRST COLLABORATION WITH RRF
RETINA SOCIETY Retina Society	RRF Award of Merit in Retina Research	1978
ARVO Assoc. for Research in Vision and Ophthalmology	RRF Lawrence Travel Awards	1984
ISER International Society for Eye Research	RRF Paul Kayser International Award	1986
SIS Schepens International Society	Charles L. Schepens, MD/AAO Award	1986
ASRS American Society of Retina Specialists	RRF Pyron Award	1988
PAAO Pan-American Association of Ophthalmology	Gillingham Fellowships Paul Kayser/RRF Global Award	1992
AAO American Academy of Ophthalmology	Educational Trust Fund	1993
MACULA SOCIETY Macula Society	RRF Cox Research Project	1993
CLUB JULES GONIN Club Jules Gonin, Swiss Ophthalmological Society, University of Lausanne, International Congress of Ophthalmology	Gonin Lecturer Gonin Medalist	1996
BAYLOR Baylor College of Medicine	Research Chair	1998
UW University of Wisconsin	Research Chairs and Professorships	1998
MERI McPherson Eye Research Institute	Research Chairs and Professorships	2007
ICO/ICOF International Council of Ophthalmology	ICO/Helmerich International Fellowships	2009

RETINA RESEARCH SITES

PAST AND PRESENT

TEXAS : 11

Baylor College of Medicine
Center for Technology
Houston Advanced
Research Center
UT MD Anderson Cancer Center
Southwest Research Institute
Texas A & M Health
Science Center
Texas Children's Hospital
The Methodist Hospital
University of Houston
University of Texas
at Galveston
University of Texas
at Houston

NATIONAL : 47

Bascom Palmer Eye Institute	Miami, FL	Northwestern University	Evanston, IL
Beaumont Hospital	Royal Oak, MI	Rockefeller University	New York, NY
California Institute of Technology	Pasadena, CA	Schepens Eye Research Institute	Boston, MA
Casey Eye Institute	Portland, OR	Sheie Eye Institute	Philadelphia, PA
Cleveland Eye Clinic/Foundation	Cleveland, OH	St. Joseph's Hospital	Baltimore, MD
Cole Eye Institute	Cleveland, OH	Stanford University Medical School	Palo Alto, CA
Columbia University	New York, NY	Tulane University Medical School	New Orleans, LA
Cornell University Medical College	Ithaca, NY	Thomas Jefferson University	Philadelphia, PA
Dean McGee Eye Institute	Oklahoma City, OK	University of California	Berkeley, CA
Duke University Medical School	Durham, NC	University of California	Los Angeles, CA
Emory University Eye Center	Atlanta, GA	University of California	San Francisco, CA
Eye Research Institute	Boston, MA	University of Florida	Gainesville, FL
Eye Tech Pharmaceuticals	Worcester, MA	University of Kansas Medical College	Kansas City, KS
Greater Baltimore Medical Center	Baltimore, MD	University of Miami Medical School	Miami, FL
Harvard Medical School	Boston, MA	University of Nebraska HSC	Omaha, NE
Johns Hopkins University Medical School	Baltimore, MD	University of Pennsylvania	Pittsburg, PA
Joslin Diabetes Center	Baltimore, MD	University of Southern California	Los Angeles, CA
Jules Stein Eye Institute	Los Angeles, CA	University of Washington	Seattle, WA
Kresge Eye Institute	Detroit, MI	University of Wisconsin Medical School	Madison, WI
Massachusetts Eye & Ear Infirmary	Boston, MA	Vanderbilt University	Nashville, TN
Massachusetts Institute of Technology	Boston, MA	Washington University	St. Louis, MO
McPherson Eye Research Institute	Madison, WI	Wills Eye Hospital	Philadelphia, PA
Medical University of South Carolina	Charleston, SC	Wilmer Eye Institute	Baltimore, MD
National Eye Institute	Bethesda, MD		

INTERNATIONAL : 32

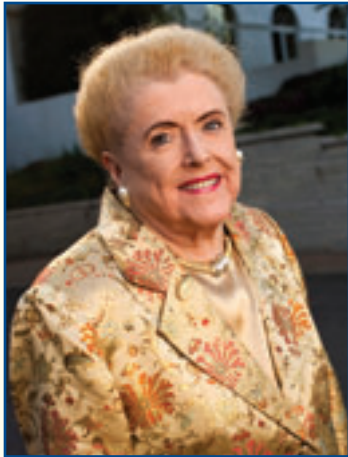
Asahikawa Medical College	Asahikawa, Japan
Bern University Hospital	Bern, Switzerland
Eskisehir Osmangazi University	Eskisehir, Turkey
Eye Foundation Hospital	Laos, Nigeria
Hospital Ophthalmique	Lausanne, Switzerland
Institut de la Vision	Paris, France
Kasindo Eye Clinic	E. Sarajevo, Bosnia and Herzegovina
Keio University	Tokyo, Japan
L V Prasad Eye Institute	Hyderabad, India
Lariboisiere Hospital	Paris, France
Lidcombe Hospital	Sydney, Australia
Lund University	Lund, Sweden
Magrabi ICO Cameroon Eye Institute	Yaounde, Cameroon
Mashhad University Medical Services	Mashhad, Iran
Melles Cornea Clinic	Rotterdam, Netherlands
McGill University	Montreal, Canada
Montreal General Hospital	Montreal, Canada
Moorfields Eye Hospital	London, England
Osaka Medical School	Osaka, Japan
Research Institute of Ophthalmology	Cairo, Egypt
Royal College of Ophthalmologists	Edinburgh, Scotland
Sankara Nethralaya Eye Hospital	Chennai, India
University of Cambridge	Cambridge, England
University of Iceland	Reykjavik, Iceland
University of Osaka	Osaka, Japan
University of Oxford	Oxford, England
University of Paris	Paris, France
University of Erlangen-Nuremberg	Erlangen, Germany
University of Leipzig	Leipzig, Germany
University of Regensburg	Regensburg, Germany
University of Tübingen	Tübingen, Germany
Western General Hospital	Edinburgh, Scotland

PAN AMERICAN COUNTRIES : 21

Buenos Aires, Argentina
Curitiba, Argentina
La Paz, Bolivia
Belo Horizonte, Brazil
São Paulo, Brazil
Porto Alegre, Brazil
Santiago, Chile
Bogotá, Colombia
Cali, Colombia
San Juan, Costa Rica
Santo Domingo, Dominican Republic
San Salvador, El Salvador
Port-au-Prince, Haiti
San Lorenzo, Honduras
Mexico City, Mexico
Nuevo León, Mexico
Asunción, Paraguay
Lima, Peru
San Juan, Puerto Rico
Montevideo, Uruguay
Caracas, Venezuela

Site Visit to Madison, Wisconsin: McPherson ERI

A highlight of 2012 was the opportunity for representatives of Retina Research Foundation to travel to University of Wisconsin-Madison for scientific presentations, tours of research laboratories under construction, and events



Alice R. McPherson, MD

*(Photo by John Maniaci/
University of Wisconsin Hospital)*

related to the renaming ceremony of the McPherson Eye Research Institute (MERI). Eight members of RRF's Board of Directors, two Advisory Trustees, five members of the Helmerich family, two RRF guests, and two staff members traveled with Dr. Alice McPherson for a comprehensive site visit.

Activities planned for the group included an afternoon of scientific presentations by nine of the over 100 MERI scientists and scholars, plus a hard-hat tour of the new Wisconsin Institutes for Medical Research II (WIMR II) led by Dr. Robert Golden, Dean of the School of Medicine and Public Health, and Dr. Richard Moss, Associate Dean. The top floor of this second tower of the medical research complex will be home to the laboratories of MERI scientists when completed near the end

of 2013. RRF supports four Chairs and three Professorships at the University of Wisconsin, so the visit by the Board members was an outstanding opportunity for them to see and hear detailed presentations from the scientists about their projects, discoveries, and plans for the future.



Dr. David Gamm

Interim Chancellor David Ward and Judith Ward hosted a luncheon at their home, the historic Olin House, and dedicated the newly renamed McPherson Eye Research Institute at that time. Formerly the UW-Eye Research Institute, the McPherson Eye Research Institute was renamed in honor of Dr. McPherson's lifelong dedication to vision research.

(continued on page 7)



**Welcoming RRF to the Wisconsin Institutes for Medical Research
(Photos by Jeff Miller/UW-Madison)**

Site Visit to Madison, Wisconsin: McPherson ERI

(continued from page 6)

Dr. David Gamm was named the Emmett Humble Distinguished Director of the McPherson Eye Research Institute (MERI) and began his new role effective July 1, 2012, upon Dr. Dan Albert's retirement.

Dr. Albert is founding Director of the UW-Eye Research Institute. He has built an environment in which scientists of diverse disciplines work in collaboration to find novel approaches to the goals of curing blindness and preventing



Dr. Matthew Davis, Dr. McPherson and Dr. Daniel Albert

vision loss. Researchers focus on understanding the mechanisms of blinding diseases and also on developing strategies for the prevention or treatment of eye disorders.

Quoting Dr. Paul Kaufman, Chair of the Department of Ophthalmology and Visual Sciences, "David Gamm is that rarest of individuals in our field, a practicing physician and basic scientist who has already done transformative translational research and demonstrated outstanding leadership and team-building skills, all at an early career stage. He will be an outstanding director of ERI and a worthy successor to Dr. Daniel Albert, ERI's distinguished founding director."



*Dr. Alice McPherson and Interim Chancellor David Ward
McPherson Eye Research Institute renaming,
Olin House Library*



Tour of the new building (WIMR II)

Site Visit to Madison, Wisconsin: McPherson ERI



Tour of laboratory space



Judith Ward congratulates Dr. McPherson



Representatives of Retina Research Foundation at University of Wisconsin

Research

RRF provided funding for 12 pilot study research projects conducted at leading research institutions. Nine of the projects were named in recognition of generous support through gifts and years of exceptional service to the Foundation.

Pilot studies are experimental studies designed to “test the waters” or break new ground. Findings may lead to larger ongoing studies in the future.

Named Basic Research Projects



The Kathryn and Latimer Murfee Macular Degeneration Project

Nansi Jo Colley, PhD

Dept. of Ophthalmology and Visual Sciences
McPherson Eye Research Institute
University of Wisconsin, Madison, WI

*Molecular genetic studies of retinal degeneration in *Drosophila**

Dr. Colley’s work on the GPI anchor and the enzyme GPI-MT2 has demonstrated that mutations in GPI-MT2 cause retinal degeneration in fruit fly models. This study, published in *Visual Neuroscience* in 2012, sheds light on a novel pathway for retinal degeneration in humans. Dr. Colley’s laboratory uses *Drosophila* (fruit fly) as a model for studying hereditary human retinal diseases such as retinitis pigmentosa (RP) and age-related macular degeneration (AMD).



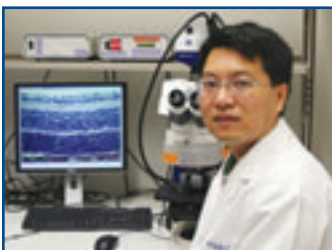
Joe M. and Eula C. Lawrence Research Project

Milan Jamrich, PhD

Dept. of Molecular and Cellular Biology
Baylor College of Medicine, Houston, TX

Function of Rx in the specification, differentiation and survival of vertebrate retinal cells

The goal of Dr. Jamrich’s project is to identify genes and developmental processes that are responsible for development and survival of vertebrate retinal cells, leading to the better understanding of eye diseases. The retinal gene Rx, initially isolated in Dr. Jamrich’s laboratory, plays a critical role in the vertebrate eye development. To test the possibility that Rx acts during retinal development by interacting with other known transcriptional regulators, Dr. Jamrich began to analyze genetic interactions between Rx and other transcription factors. Using a mouse model, he found genetic evidence that Rx does interact with the transcription factor Lhx2. While the mode of action of Lhx2 is not known in detail, it has been shown that this gene is required for the specification and the morphogenesis of the retinal field. There is strong genetic evidence that Rx and Lhx2 interact.



The W.O. Manning Research Project

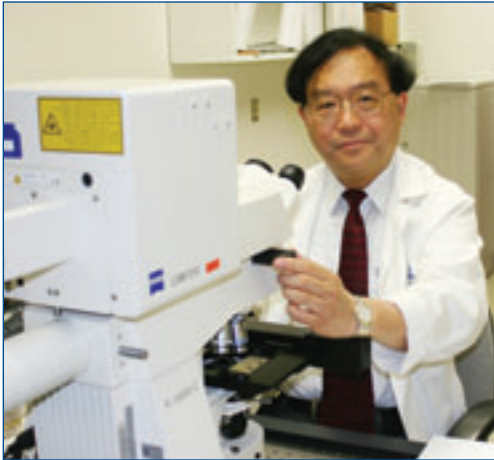
Rui Chen, PhD

Dept. of Molecular and Human Genetics
Baylor College of Medicine, Houston, TX

Identification and functional analysis of genes involved in retinal diseases and development

Understanding molecular mechanisms of normal retina development is an essential part for better understanding the mechanisms and designing novel treatments of eye diseases. The goal of Dr. Chen’s project is to identify novel genes involved in human retinal disorders and conduct functional analysis of genes involved in retinal development using a model organism such as *Mus musculus* (house mouse). Dr. Chen’s laboratory successfully cloned the LCA3 disease gene. To better understand its normal function in the retina, they examined the expression pattern of Spata7 in the developing and mature mouse retina and found that LCA3 is expressed in multiple layers, most strongly in the inner segment of photoreceptor cells. Results suggest a novel disease mechanism of LCA in which LCA3 functions as part of the protein transporter vesicle, potentially as a cargo receptor, in photoreceptor cells function.

Research



The Paul Kayser Research Project

Samuel Wu, PhD

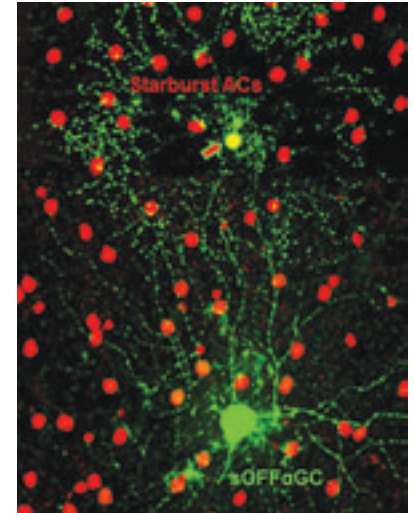
Cullen Eye Institute

Baylor College of Medicine, Houston, TX

Pharmacological and genetic mechanisms underlying retinal cell death in glaucoma and age-related macular degeneration (AMD)

Dr. Wu's research project is focused on molecular, cellular and genetic mechanisms underlying retinal cell death in glaucoma

and age-related macular degeneration (AMD). His lab has designed and constructed new non-invasive devices for early detection of photoreceptor and ganglion cell dysfunction in animals and humans. Dr. Wu's team has published five papers in top international journals in 2012. These publications report new discoveries on new animal models for retinitis pigmentosa (RP) and Leber congenital amaurosis, as well as physiological and pharmacological properties of healthy and diseased mouse retinal neurons. Currently, his group is studying synaptic mechanisms underlying retinal ganglion cell death in acute and chronic glaucoma models, and developing and constructing new non-invasive devices for early detection/diagnosis of AMD and glaucoma in animals and humans.



Confocal image of a flat-mounted retina of a ChAT-cre fluorescence mouse, in which all cholinergic amacrine cells show red fluorescence. A starburst amacrine cell (arrow) and a sustained OFF alpha ganglion cell (sOFFαGC) were filled with neurobiotin (green) via whole-cell patch electrodes. Calibration bar: 10μm.



Bertha and I.L. Miller Research Project

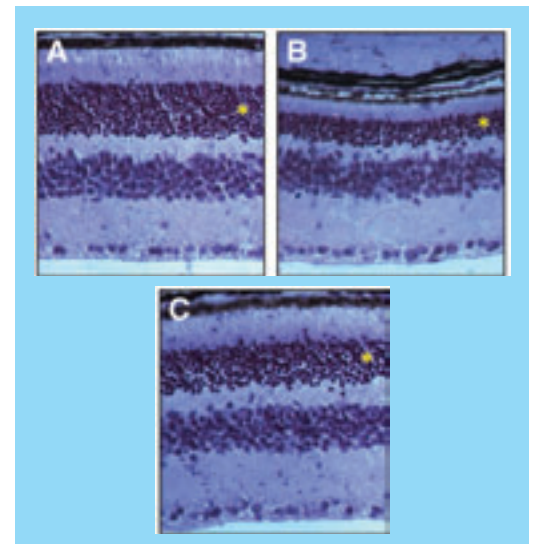
Graeme Mardon, PhD

Depts. of Pathology, Molecular and Human Genetics

Baylor College of Medicine, Houston, TX

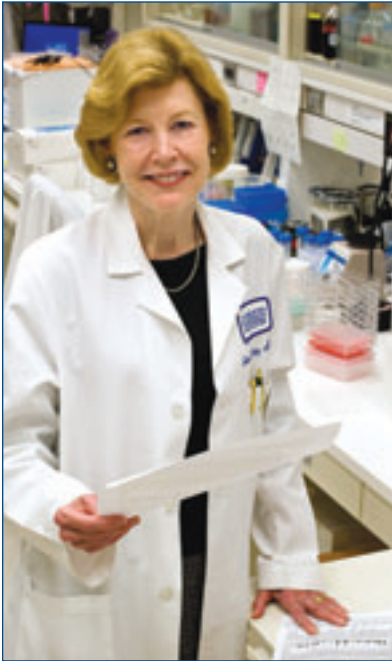
Genetic and molecular analysis of retinal development and disease

The long-term goal of Dr. Mardon's project is to improve both the diagnoses and treatments of Leber congenital amaurosis (LCA). Dr. Mardon's laboratory has identified a new gene associated with LCA3 (named SPATA7), which encodes a highly conserved but novel protein of unknown function and for which no animal models have been established. Dr. Mardon has knocked out the mouse SPATA7 gene by gene targeting, analyzed the phenotype of SPATA7 mutants by histology, immunohistochemistry, electrophysiology, and transmission electron microscopy, and has submitted this work for publication. His laboratory has also shown that the retinal defects observed in SPATA7 mutant mice can largely be rescued by gene therapy, suggesting that the ultimate goal of treating human patients with mutations in SPATA7 is possible.



Gene therapy rescues photoreceptor degeneration in Spata7 mutant mice. Sections of adult retinas from wild-type (A), Spata7 mutant (B), or Spata7 mutant treated by gene therapy (C) are shown. All animals are eight weeks old. Loss of Spata7 function causes a 50% loss of the photoreceptor layer by eight weeks of age (compare the layers indicated by yellow asterisks in A and B). Treating Spata7 mutant mice with AAV-mediated gene therapy at 18 days of age strongly rescues the photoreceptor layer defect (yellow asterisk in C) and the response to light (not shown).

Research



Emmett A. Humble Research Project

Louise C. Strong, MD

Dept. of Genetics

University of Texas M.D. Anderson Cancer Center
Houston, TX

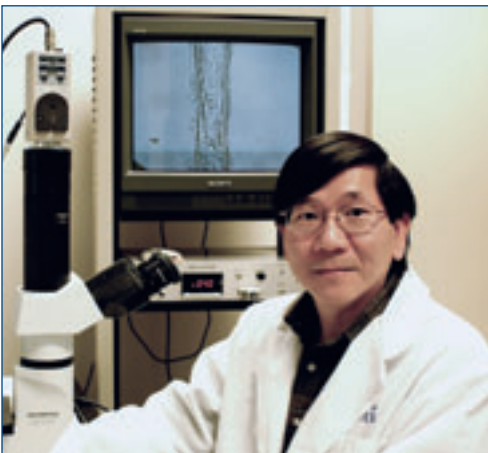
Genetic etiology of retinoblastoma

Dr. Strong's overall goal is to characterize the genetic mechanisms of the non-ocular cancers that occur in hereditary retinoblastoma patients and their relatives. This is a significant health problem as the most frequent cause of death in hereditary retinoblastoma patients is a second non-ocular malignant neoplasm; it is also an important biologic question, as the retinoblastoma "pathway" is considered to be critical to the development of most cancers.

Current research involves identifying genetic factors that affect the non-ocular cancer risk, with focus on differences in the Rb1 mutations, and/or other genes such as those that may modify radiation sensitivity. This work is based on some 30 families with hereditary retinoblastoma and non-ocular cancers who have contributed samples supported by the RRF.



Strong Research



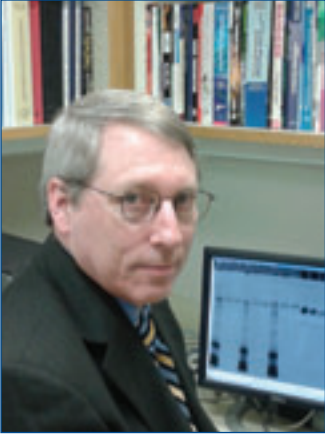
Adolphe G. and Josephine Roberts Gueymard Research Project

Lih Kuo, Ph.D.

Depts. of Medical Physiology, Surgery, and Ophthalmology
Texas A&M Health Science Center, Temple, TX

Activation of endothelin-dependent RhoA/ROCK by C-reactive protein elicits retinal arteriolar dysfunction

The purpose of Dr. Kuo's project is to understand the pathophysiology of inflammation (CRP) – and diabetes-associated retinal vascular dysfunction. The objective of this application is to focus on the therapeutic potential of ECE-1 and RhoA/ROCK blockade on the restoration of retinal microvascular function during inflammatory insults caused by CRP elevation and ischemia, the common phenotype in association with diabetic retinopathy, acute angle-closure glaucoma, retinal vascular occlusion, and elevated intraocular pressure during vitreous surgery or after vitreoretinal surgery. The retinal arteriolar dysfunction can be produced by acute diabetes in the pig, which they have recently shown to resemble humans in retinal arteriolar physiology and pathophysiology. Preliminary data suggest that the retinal vascular dysfunction induced by diabetes might be related to the activation of ROCK via the endothelin system in the vascular wall.



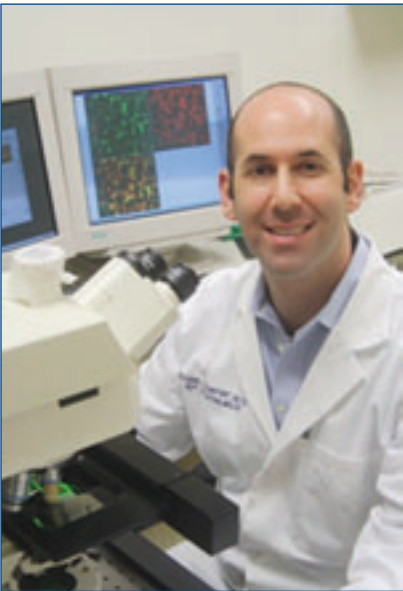
Mary Ellen Wilson Research Project

Richard L. Hurwitz, MD

Dept. of Pediatrics, Ophthalmology, Molecular and Cellular Biology
Co-Director, Retinoblastoma Center
Texas Children's Cancer Center
Center for Cell and Gene Therapy
Baylor College of Medicine, Houston, TX

Immune consequences of gene therapy for ocular disorders

Children treated with chemotherapy or radiation therapy for retinoblastoma (Rb) have a significantly increased risk of developing other types of cancer later in life. Sometimes small pieces of tumor break off into the vitreous, forming multiple small tumors called vitreous seeds. There is no good therapy for this condition, so developing alternative treatments is important. Dr. Hurwitz is investigating the feasibility of gene replacement as an innovative treatment for Stargardt Disease and as a prototype for other inherited retinal degenerative diseases. His laboratory has completed the first clinical trial that used suicide gene therapy (a method of forcing the tumor cells to produce a protein that converts a drug to an agent that is toxic to the tumor cells) to treat children with advanced Rb, and the successful results have encouraged him to continue his laboratory initiatives to improve this innovative therapy.



Carl G. Mueller, Jr. Research Project

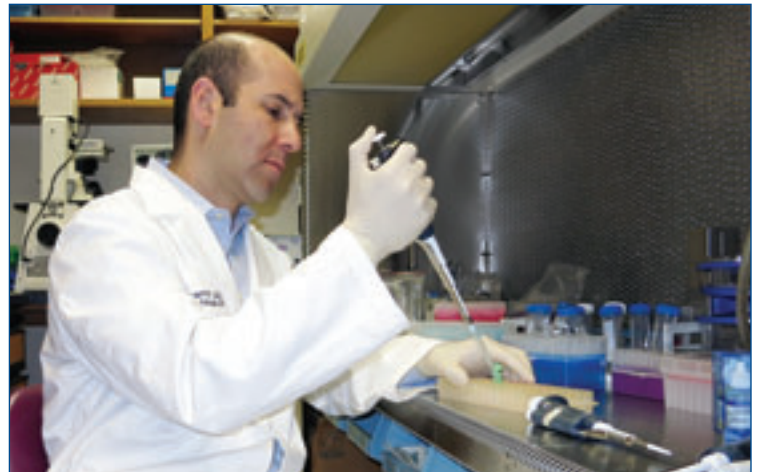
Benjamin J. Frankfort, MD, PhD

Cullen Eye Institute
Baylor College of Medicine, Houston, TX

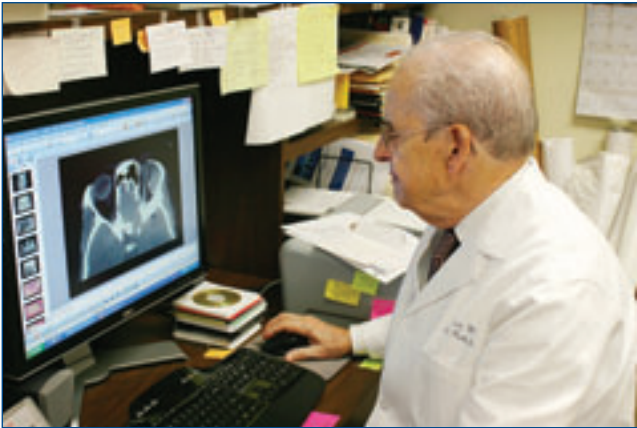
Impact of elevated intraocular pressure on retinal function in mice

Dr. Frankfort's research goal is to understand the earliest visual function changes that occur to retinal ganglion cells (RGCs) in glaucoma. RGCs integrate all of the information from the retina and then transmit it to the brain via their axonal extensions, which make up the optic nerve. There is evidence for subtle visual changes occurring in early glaucoma resulting in a loss of contrast sensitivity. Dr. Frankfort's lab has developed a technique by which the IOP can be mildly elevated in a mouse with a simple, reproducible, and rapid surgical technique. Once the IOP is elevated, changes in retinal activity may

be identified with a combination of electrophysiological and behavioral techniques. These studies indicate that electrical activity of the retina and visual performance are disturbed prior to RGC death and suggest that retinal dysfunction precedes cell loss in mice with experimental glaucoma.



Basic Research Grants



Ramon Font, MD

Cullen Eye Institute

Baylor College of Medicine, Houston, TX

Immunohistochemistry and molecular biology in ophthalmic pathology

Dr. Font's research interest is to study the histologic features, pathogenesis and immunohistochemical profile of ophthalmic lesions involving the eye and ocular adnexa. The purpose of his study is to correlate a selected group of inflammatory conditions that involve the eye and ocular adnexa and are rich in plasma cells with the subclass IgG4. Understanding the biologic immunologic

behavior of the involved tissues makes possible an analysis of the role of specific immunomodulators to control the inflammatory process.



Leonard Levin, MD, PhD

Dept. of Ophthalmology and Visual Sciences

McPherson Eye Research Institute

University of Wisconsin, Madison, WI

Pharmacological protection of endothelial cells for retinal vascular disease

In some blinding retinal diseases, the initial event is damage to endothelial cells, which line the inside of the blood vessels. Dr. Levin has demonstrated, in collaboration with Dr. Timothy Kern of Case Western Reserve University, that endothelial cell death can be slowed down in a transgenic mouse where

endothelial cell death is blocked with an anti-death protein. Dr. Levin has worked on developing novel drugs that block cell death. In the past four years, Dr. Levin's laboratory has established that their drugs, phosphine-borane complexes, block endothelial cell death in tissue culture induced by radiation and by free radicals. The prevention of cell death from radiation is relevant to the eye because it is not uncommon that eyes undergoing radiation therapy for tumors develop "radiation retinopathy." Radiation retinopathy can take away vision, and there is currently no effective treatment.



Barbara Klein, MD, MPH

Dept. of Ophthalmology and Visual Sciences

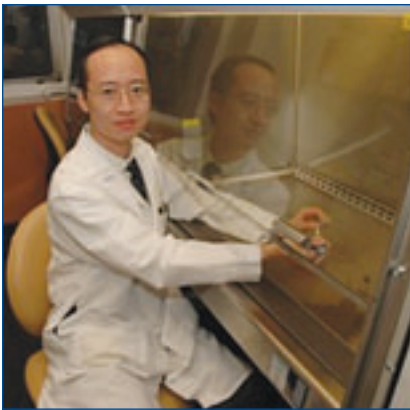
University of Wisconsin, Madison, WI

Prevalence and incident changes in retinal vascular caliber associated with medication and supplement use

Completing an exhaustive analysis of use of medication and supplements over 20 years in a population-based study, Dr. Klein's project has disclosed several significant associations between medications and retinal vessel diameters (RVDs). Retinal vessel diameters are associated with cardiovascular diseases and also with

other ocular diseases. For example, wider retinal venules are associated with the severity of diabetic retinopathy, and one study has reported evidence of an association of RVD and age-related macular degeneration (AMD). During this three year study, Dr. Klein's goal has been to determine whether the use of vasodilating and anti-inflammatory medications should be accounted for when using retinal vessel measurements as biomarkers of systemic and ocular conditions.

Grant Recipients from The Macula Society



The RRF Margaret and Mills Cox Macula Society Research Project

Stephen Tsang, MD, PhD

Edward S. Harkness Eye Institute, Columbia University
New York, NY

Genetic and environmental factors in AMD

Dr. Tsang's laboratory is tackling the problem of photoreceptor cell degeneration by pursuing investigations in three areas: probing the role of phosphodiesterase (PDE) signaling in retinal degeneration; developing stem cell-based therapies for retinal degeneration; and correlating the genotypes of various human photoreceptor cell degenerations with the phenotypes revealed in fundus autofluorescence (AF) images.



Stephen Jae Kim, MD

Vanderbilt Eye Institute
Nashville, TN

Safety, pharmacokinetics, and efficacy of Celecoxib and Valdecoxib after intraocular administration for macula edema

Dr. Kim is a nationally recognized expert in the medical and surgical management of retinal disease and uveitis, including the use and monitoring of systemic immunosuppression.

Established Research Awards

These awards were presented to known scientists in recognition of their lifetime achievement.



The Award of Merit in Retina Research

Richard F. Spaide, MD

Vitreous-Retina-Macula Consultants
New York, NY

Retinal Pigment Epithelial Cell Loss Assessed by Fundus Autofluorescence in Patients with Neovascular Age-related Macular Degeneration

In being chosen for the Award of Merit, Dr. Spaide gave the Charles L. Schepens Lecture at the 45th Annual Scientific Meeting of The Retina Society in Washington, DC, which was held in October.

Dr. Spaide's research interests include macular degeneration, biochemical analysis of lipids in Bruch's membrane, ocular imaging, and intraocular inflammation. He was instrumental in the development of combined photodynamic therapy and intravitreal triamcinolone for age-related macular degeneration (AMD), a very promising therapy that is currently the focus of a randomized trial. He has developed numerous surgical instruments that were named after him. His current research interests include development of autofluorescent photography of the eye using a fundus camera.

Established Research Awards



Gertrude Pyron Award for Outstanding Achievement in Retina Research

Daniel F. Martin, MD

Chairman, Cole Eye Institute
Cleveland, OH

Two-year Results from the Comparison of AMD Treatment Trials (CATT)

Dr. Martin presented the RRF Pyron Award lecture at the 30th Annual Meeting of the American Society of Retina Specialists (ASRS), which was held in Las Vegas, NV in August.

Dr. Martin has been involved in the design, development, and execution of many clinical trials having served as principal investigator for many studies, including AREDS, SOCA, and numerous AMD and diabetes trials. He has served as the Study Chairman for many national randomized clinical trials, including the trials that led to FDA approval of the ganciclovir implant and valganciclovir. Dr. Martin currently serves as the Study Chair for the Comparison of AMD Treatments Trials (CATT), an NIH sponsored study evaluating the comparative efficacy and safety of Lucentis and Avastin for the treatment of neovascular AMD.



Charles L. Schepens, MD/AAO Award

Alan C. Bird, MD

Moorfields Eye Hospital
London, England

Potential Therapeutic Approaches to AMD

In being selected for the Charles L. Schepens, MD/AAO Award, Dr. Bird gave the Charles L. Schepens, MD/AAO Lecture at the Retina Subspecialty Day of the American Academy of Ophthalmologists (AAO) Annual Meeting in Chicago, IL on November 9.

Dr. Bird is one of the world's experts on treating retinal vascular disease and degenerative retinal disorders. His research has contributed to important breakthroughs in the understanding of retinal diseases such as retinal dystrophies and age-related macular disease. Investigative techniques have included molecular genetics, cell biology, electrophysiology, psychophysics, specialized imaging and morphology. In addition, Dr. Bird has undertaken studies in Africa on Onchocerciasis (river blindness) that have had a major impact on reducing blindness in the world by stimulating a new standard of treatment for that disease.



Dr. Stanley Chang and Dr. Alan Bird



Dr. Joan Miller, Dr. Alan Bird, and Dr. Alice McPherson following the Schepens Lecture

Established Research Awards



Paul Kayser International Award in Retina Research

Robert E. Anderson, MD, PhD

Dean McGee Eye Institute
Oklahoma City, OK

AD Stargardt's Disease: Biochemical Basis and Therapeutic Approaches

The 20th Biennial Meeting of the International Society for Eye Research (ISER), held in Berlin, Germany, in July was the setting for Dr. Anderson's lecture as recipient of the Kayser International Award.

Dr. Anderson's laboratory established the essentiality of omega-3 fatty acids, which are major components of fish oils, in the development of the visual system in the retina. Later studies by his lab and others showed their beneficial effects in term and preterm human infant retinal development. As a result of these studies, DHA (the major omega-3 fatty acid in the retina) is now included in many infant formulas. Dr. Anderson's laboratory showed over 10 years ago that PBN, a free radical spin trapping compound, protects the retina from light-induced retinal degeneration. Recently his team discovered that PBN inhibits a specific enzyme in the retinal pigment epithelium (RPE) that is important in the "visual cycle." Slowing the visual cycle has been shown to reduce the levels of a toxic product called lipofuscin, which accumulates in the RPE in age-related macular degeneration, Best's Disease, Stargardt's Disease, and others.



Club Jules Gonin Lecturer

Professor José-Alain Sahel

Institut de la Vision
Paris, France

Extending Cone Photoreceptors' Life in Retinitis Pigmentosa

Dr. Sahel gave the Gonin Lecture at the XXVIII Meeting of Club Jules Gonin in Reykjavik, Iceland, in June. This award is given every two years to a scientist making a significant contribution to the understanding and treatment of eye diseases.

Prof. Sahel has been instrumental in the development of treatments for hereditary retinal degenerations. While continuing uninterrupted clinical activity in vitreoretinal surgery and oncology, he is now focused on retinal dystrophies and AMD. He has designed innovative clinical trials based on improved retinal imaging (gene therapy) and developed improved visual restoration strategies.

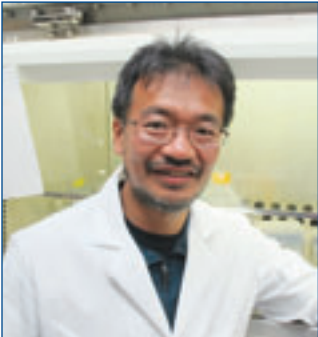


*Dr. Harry Flynn, Dr. Susanne Binder
and Dr. José Sahel following the Gonin Lecture*

Research Chairs and Professorships

RRF supports a total of five chairs and three professorships in retina research, which provide funds to vision scientists engaged in original excellent research that has the potential to increase understanding of the retina or retinal diseases.

Funding is provided by gifts from Margaret and Mills Cox, Gertrude D. Pyron, W. H. Helmerich, III, Kathryn and Latimer Murfee, Rebecca Meyer Brown, Dorothy Portier, M. D. “Bill” Matthews Foundation, and gifts given in honor of Emmett A. Humble, RRF Board Chairman for many years.



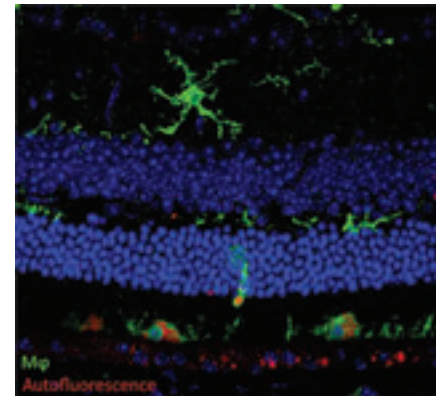
Walter H. Helmerich Chair

Akihiro Ikeda, DVM, PhD

Associate Director, McPherson Eye Research Institute
Department of Medical Genetics
University of Wisconsin, Madison, WI

*Identification of Genetic Factors Affecting
Aging of the Retina*

Dr. Ikeda uses mouse models to study the genetic and molecular mechanisms of aging. He believes that for age-dependent diseases to manifest themselves in an age-dependent manner, there must be tight association between the disease-causing mechanisms and cellular changes that occur with aging. Therefore, it is important to understand how aging process is regulated at the molecular level, and how aging process is associated with disease mechanisms. Specifically, Dr. Ikeda’s laboratory aims to identify gene mutations that lead to early onset of aging phenotypes in the mouse retina.



The retina of a mutant mouse with accelerated aging symptoms show AMD-like phenotypes such as accumulation of autofluorescence and inflammation.



Ikeda Lab



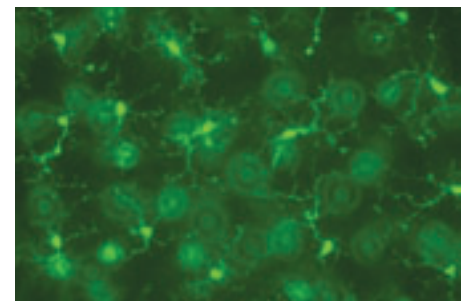
RRF Chair

Nader Sheibani, PhD

Department of Ophthalmology
and Visual Sciences
University of Wisconsin, Madison, WI

*Regulation of Ocular Vascular Development
and Neovascularization*

Ocular vascularization is tightly regulated and exhibits a very restricted pattern, which is normally kept in check by finely tuned regulatory mechanisms. These mechanisms are altered under various pathological conditions such as diabetes, leading to growth of new and abnormal vessels, which can result in loss of vision. Dr. Sheibani’s main area of research is to delineate these regulatory mechanisms and identify how their alterations result in growth of new blood vessels. Dr. Sheibani utilizes various in vivo and in vitro models for his research, which will help to advance our understanding of these mechanisms and their therapeutic targeting.



Microglia in the mouse retina.

Research Chairs and Professorships



Emmett A. Humble Distinguished Directorship

David M. Gamm, MD, PhD

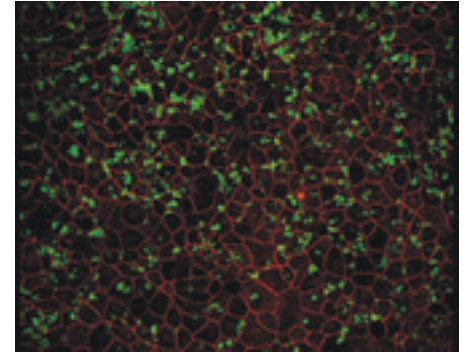
Director, McPherson Eye Research Institute

Department of Ophthalmology
& Visual Sciences

University of Wisconsin, Madison, WI

*Modeling Retinal Disease with
Human Pluripotent Stem Cells*

Dr. Gamm recently published a paper (January, 2013 *Human Molecular Genetics*) describing his laboratory's ability to generate human retinal cells from a small skin sample taken from a patient with a form of macular degeneration (Best Vitelliform Macular Dystrophy). He did so using induced pluripotent stem cell technology, and used the retinal cells he created to study the disease process and learn why the cells did not function properly. He is now using this information to devise treatments to slow or stop the disease.



Human retinal pigment epithelium (outlined in red) derived from induced pluripotent stem cells created from a patient with Best Vitelliform Macular Dystrophy, a type of blinding disorder. The green areas are indicative of material that has not been properly digested by these cells, which is a prominent feature of this disease. (Image taken by Dr. Ruchira Singh, Gamm lab)



Kathryn and Latimer Murfee Chair

Arthur S. Polans, PhD

McPherson Eye Research Institute

Department of Ophthalmology & Visual Sciences
University of Wisconsin, Madison, WI

*New Agents for the Treatment of Ocular Tumors and
Neovascular Diseases of the Eye*

Based on their studies of non-toxic natural products, the Polans laboratory has developed new small-molecule agents that can be used to prevent or treat ocular tumors as well as other diseases of the eye with a neovascular component. These new agents initiate calcium signals in both activated endothelial cells and cancer cells, thereby reducing their unwanted proliferation. The Polans laboratory is now modifying these agents to improve their bioavailability and safe delivery for testing in animal models of choroidal and retinal neovascularization and models of ocular cancer.

The RRF Chair at Baylor College of Medicine has yet to be named.

Research Chairs and Professorships



Edwin and Dorothy Gamewell Professor

Arnold E. Ruoho, PhD

McPherson Eye Research Institute
Department of Neuroscience
University of Wisconsin, Madison, WI

Retinal Neuroprotection by the Sigma-1 Receptor Chaperone (cover photo)

Human neurodegenerative diseases such as spinal cord motor neuron degeneration (e.g., Lou Gehrig's Disease or ALS), Alzheimer's disease, Parkinson's disease, and retinal degenerative diseases result in part from increased levels of intracellular oxidative stress. Dr. Ruoho has identified the Sigma-1 receptor as a key common denominator in reducing neuronal oxidative stress. The Sigma-1 receptor stabilizes proteins, reduces formation of destructive forms of oxygen and nitrogen, and regulates the activity of cell surface ion channels. Dr. Ruoho's goal is to prevent blindness by applying pharmacological and genetic approaches that will enhance the biological activity of the Sigma-1 receptor in the retina. Recently, his laboratory has shown that N, N-Dimethyltryptamine (DMT) is an endogenous activator of the Sigma-1 receptor. The enzyme that produces DMT (Indole N- Methyl Transferase or INMT), is highly expressed in the non-human primate retina.



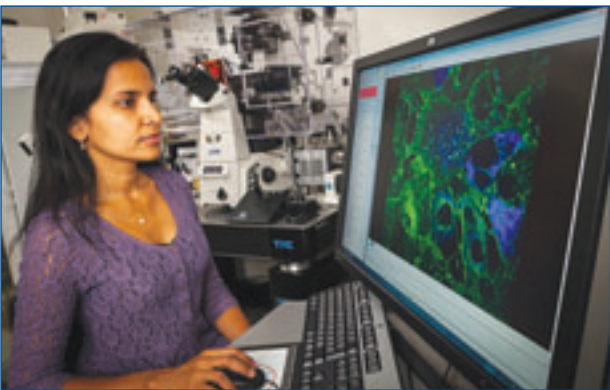
M.D. Matthews Research Professor

Nansi Jo Colley, PhD

McPherson Eye Research Institute
Department of Ophthalmology & Visual Sciences
University of Wisconsin, Madison, WI

Molecular Genetic Studies of Retinal Degeneration in Drosophila

Dr. Colley is focused on using *Drosophila* as a model for studying hereditary human retinal diseases, such as retinitis pigmentosa (RP) and age-related macular degeneration (AMD). An ongoing challenge in diagnosing and treating AMD and RP is that they are highly complex diseases with multiple subtypes, each with a distinct genetic and biochemical basis. This complexity, along with the limited availability of suitable tissues from RP and AMD patients and the broad base of knowledge of *Drosophila* genetics, all combine to make *Drosophila* a powerful animal model for studying inherited retinal degeneration disorders.



Rebecca Meyer Brown Professor

Aparna Lakkaraju, PhD

McPherson Eye Research Institute
Department of Ophthalmology & Visual Sciences
University of Wisconsin, Madison, WI

Insight into the Cellular Basis of Retinal Degenerative Diseases

Dr. Lakkaraju's focus is to tease out the cellular mechanisms underlying age-related macular degeneration. Her laboratory studies cells of the retinal pigment epithelium (RPE), which perform critical homeostatic functions that are crucial for the health of the retina and for vision. The RPE is also the site of the initial insult that eventually culminates in vision loss in many retinal diseases, including macular degeneration, although exactly how this occurs is unclear. Work from Dr. Lakkaraju's laboratory has shown that with age, RPE cells accumulate abnormal amounts of cholesterol, which causes intracellular traffic jams and compromises RPE function. The ultimate goal of her work is to use this mechanistic information to develop new therapies that can clear cholesterol and relieve traffic jams, which could help preserve the health of the retina and RPE and prevent vision loss.

International Fellowships

RRF funds two programs of international fellowships, one a twelve-month fellowship and the other a six-month fellowship.

RRF Helmerich International Fellowships/ICO

The International Council of Ophthalmology (ICO), in cooperation with the International Council of Ophthalmology Foundation (ICOF), and Retina Research Foundation, has established two international fellowships with income from an endowment created by Walter H. Helmerich, III.

These two, twelve-month fellowships of \$25,000 each provide advanced subspecialty training for young ophthalmologists from developing countries who are recommended by the head of a teaching or public service institution and are committed to returning to a position at a teaching institution or public service hospital in their home country following the fellowship.



Henry E. Nkumbe, MD, from Madagascar, for training in retina surgery at Eye Foundation Hospital in Lagos, Nigeria, and

the Jules Stein Eye Institute at the University of California, Los Angeles. Following fellowship, Dr. Nkumbe will return to train ophthalmologists and staff at the ICO Magrabi Cameroon Eye Institute in Yaounde, Cameroon. This teaching hospital is the first project of the Africa Eye Foundation.



Pukhraj Rishi, MD, from Chennai, India, for training in ocular oncology at Wills Eye Institute, Philadelphia, PA, with Drs. Carol and Jerry Shields. After fellowship, Dr. Rishi will return to train residents, fellows and ophthalmic personnel at the Sankara Nethralya Medical Research Foundation in Chennai, where he also conducts research and clinical trials.

Gillingham Fellowships/PAAO

Established by W. J. Gillingham, this program is administered for RRF by the Pan-American Association of Ophthalmology (PAAO). Two six-month fellowships, providing stipends of \$10,000 each, were awarded this year to Latin American ophthalmologists for training at leading institutions in the United States.



Daniel Lavinsky, MD, PhD, from São Paulo, Brazil, for training in retina stem cell at Stanford University, Stanford, CA, with Daniel Palanker, PhD, and Mark Blumenkranz, MD.



Tammy Hentona Osaki, MD, from São Paulo, Brazil, for training in oculoplastics at Massachusetts Eye and Ear Infirmary (MEEI), Harvard University, Boston, MA with Aaron Fay, MD.

Research Initiatives

RRF has endowed gifts with earnings applied to translational research and education to bring laboratory knowledge to the clinical level.

American Academy of Ophthalmology Educational Trust Fund

Educational programs administered for RRF by the American Academy of Ophthalmology are funded by the endowed gifts from Laura I. Cannon, Burt L. Risley, and the Schlichting family. This program will upgrade clinical research skills in the field of retina. The 2012 funding for this program was over \$45,000.

RRF Lawrence Travel Scholarships

This program is administered by the Association for Research in Vision and Ophthalmology (ARVO) and is made possible by a gift to RRF from Joe M. and Eula C. Lawrence. A total of \$20,000 was funded to provide travel expenses for young vitreoretinal scientists to attend the ARVO Annual Meeting to present their papers or posters. This year the meeting was held in May in Ft. Lauderdale, FL.



In 2012, twenty-four ophthalmology students were selected from these schools:

University of Southern California, Los Angeles, CA
Medical University of South Carolina, Charleston, SC
Vitreoretinal Surgery PA, St Cloud, MN
Penn State University, Hershey Eye Center, Hershey, PA
Jules Stein Eye Institute, Univ. of California, Los Angeles, CA
Schepens Eye Research Institute, Mass. Eye & Ear, Boston, MA
Dean McGee Eye Institute, Oklahoma City, OK
Emory University School of Medicine, Atlanta, GA
Harvard University, Children's Hospital, Boston, MA
New York Eye & Ear Infirmary, New York, NY
University of Florida, Gainesville, FL
Duke University Medical Center, Durham, NC

Memorial Sloan-Kettering Cancer Center, New York, NY
University of Minnesota, Minneapolis, MN
University of N. Texas HSC, Eye Research Institute, Ft. Worth, TX
University of Louisville, Louisville, KY
University of Rochester, Rochester, NY
Wayne State University, Detroit, MI
Brown University, Providence, RI
Herbert Eye Institute, University of California, Irvine, CA
Vanderbilt University School of Medicine, Nashville, TN
University of Tennessee Health Science Center, Memphis, TN
University of Virginia, Charlottesville, VA

COMBINED STATEMENT FINANCIAL POSITION

RETINA RESEARCH FOUNDATION
COMBINED STATEMENT OF FINANCIAL POSITION
DECEMBER 31, 2012
(With Summarized Information as of December 31, 2011)

	General Funds			Endowment Funds				2012 Total All Funds	2011 Total All Funds (Memorandum Only)
	Unrestricted	Temporarily Restricted	Total	Unrestricted	Temporarily Restricted	Permanently Restricted	Total		
ASSETS									
Cash and Cash Equivalents	\$ 650,135	\$ 73,000	\$ 723,135	\$ -	\$ 1,110,813	\$ -	\$ 1,110,813	\$ 1,833,948	\$ 887,480
Contributions Receivable	11,246	-	11,246	-	1,000,000	-	1,000,000	1,011,246	32,720
Investments	1,152,651	-	1,152,651	2,873,293	20,463,767	17,440,540	40,777,600	41,930,251	39,358,947
Furniture and Equipment, Net of Accumulated Depreciation of \$5,282)	13,070	-	13,070	-	-	-	-	13,070	13,070
Charitable Remainder Trust	-	-	-	-	-	312,374	312,374	312,374	306,304
Intangible Assets	12	-	12	-	-	-	-	12	12
TOTAL ASSETS	<u>\$ 1,827,114</u>	<u>\$ 73,000</u>	<u>\$ 1,900,114</u>	<u>\$ 2,873,293</u>	<u>\$ 22,574,580</u>	<u>\$ 17,752,914</u>	<u>\$ 43,200,787</u>	<u>\$ 45,100,901</u>	<u>\$ 40,598,533</u>
LIABILITIES AND NET ASSETS									
Accounts Payable	\$ 6,502	\$ -	\$ 6,502	\$ -	\$ 68,550	\$ -	\$ 68,550	\$ 75,052	\$ 72,791
COMMITMENTS AND CONTINGENCIES									
NET ASSETS	<u>1,820,612</u>	<u>73,000</u>	<u>1,893,612</u>	<u>2,873,293</u>	<u>22,506,030</u>	<u>17,752,914</u>	<u>43,132,237</u>	<u>45,025,849</u>	<u>40,525,742</u>
TOTAL LIABILITIES AND NET ASSETS	<u>\$ 1,827,114</u>	<u>\$ 73,000</u>	<u>\$ 1,900,114</u>	<u>\$ 2,873,293</u>	<u>\$ 22,574,580</u>	<u>\$ 17,752,914</u>	<u>\$ 43,200,787</u>	<u>\$ 45,100,901</u>	<u>\$ 40,598,533</u>

The accompanying notes are an integral part of these combined financial statements.

COMBINED STATEMENT NET ASSETS

RETINA RESEARCH FOUNDATION
COMBINED STATEMENT OF ACTIVITIES AND CHANGES IN NET ASSETS
FOR THE YEAR ENDED DECEMBER 31, 2012
(With Summarized Financial Information for the Year Ended December 31, 2011)

	General Funds			Endowment Funds				2012 Total All Funds	2011 Total All Funds (Memorandum Only)
	Unrestricted	Temporarily Restricted	Total	Unrestricted	Temporarily Restricted	Permanently Restricted	Total		
REVENUES:									
Contributions	\$ 251,183	\$ 63,000	\$ 314,183	\$ -	\$ 1,000,000	\$ 166,903	\$ 1,166,903	\$ 1,481,086	\$ 605,655
Interest, Dividend and Distribution Income	29,070	-	29,070	72,295	977,484	-	1,049,779	1,078,849	1,013,942
Realized and Unrealized Gains (Losses) on Investments, Net	91,911	-	91,911	229,114	3,097,730	-	3,326,844	3,418,755	(1,502,947)
Mineral Interest Income and Other Income	99,487	-	99,487	-	-	-	-	99,487	123,037
Change in Value of Split-Interest Agreement	-	-	-	-	-	6,070	6,070	6,070	(17,969)
Income Transferred from Endowment Fund Investments	922,902	75,000	997,902	(68,723)	(929,179)	-	(997,902)	-	-
Net Assets Released from Restrictions- Satisfaction of Program Restrictions	150,000	(150,000)	-	-	-	-	-	-	-
Total Revenues	1,544,553	(12,000)	1,532,553	232,686	4,146,035	172,973	4,551,694	6,084,247	221,718
EXPENSES:									
Program Services:									
Research Projects and Grants	1,102,802	-	1,102,802	-	-	-	-	1,102,802	946,255
Public Education	28,509	-	28,509	-	-	-	-	28,509	36,090
Career Development and Awards	77,073	-	77,073	-	-	-	-	77,073	79,843
Total Program Services	1,208,384	-	1,208,384	-	-	-	-	1,208,384	1,062,188
Supporting Services:									
Management and General	91,696	-	91,696	18,978	254,663	-	273,641	365,337	375,911
Fund Raising	10,419	-	10,419	-	-	-	-	10,419	28,807
Total Supporting Services	102,115	-	102,115	18,978	254,663	-	273,641	375,756	404,718
Total Expenses	1,310,499	-	1,310,499	18,978	254,663	-	273,641	1,584,140	1,466,906
Changes in Net Assets	234,054	(12,000)	222,054	213,708	3,891,372	172,973	4,278,053	4,500,107	(1,245,188)
Net Assets, Beginning of Year	1,586,558	85,000	1,671,558	2,659,585	18,614,658	17,579,941	38,854,184	40,525,742	41,770,930
Net Assets, End of Year	\$ 1,820,612	\$ 73,000	\$ 1,893,612	\$ 2,873,293	\$ 22,506,030	\$ 17,752,914	\$ 43,132,237	\$ 45,025,849	\$ 40,525,742

The accompanying notes are an integral part of these combined financial statements.

Officers and Boards

Officers

Frank K. Eggleston, DDS
Chairman

Bruce B. Mack
Treasurer

Alice R. McPherson, MD
President

Cecil C. Rix, Ph.D. △
Chairman, Board of Advisory Trustees

John C. Dawson, Jr.
Secretary

Jacquelyn M. Royce
Assistant Secretary

Board of Managing Directors

Lynn A. Bernard, Jr.
John C. Dawson, Jr. ✧
Frank K. Eggleston, DDS + ✧
Shara Fryer
L. Henry Gissel, Jr.
Bernard Hicks, MD
Emmett A. Humble ✧
Nancy F. Japhet
James E. Key, MD
Kelli Kickerillo
Bettie Harding Lee ✧

Alice R. McPherson, MD ✧
Bruce B. Mack ✧
Ben F. Orman, MD
Cecil C. Rix, PhD △
Jacquelyn M. Royce
F. Ames Smith ✧
H. Richard Walton
Diana M. “Dede” Weil
Arthur Willis, MD
R. Malcolm Wooley

Board of Advisory Directors

John T. Cater
Herbert A. Lesser, PhD

Lawrence P. Washington
James N. Winfrey

Board of Advisory Trustees

Jane L. Anthony
Lucy G. Arnold
Margaret Barrow
Roger Beebe
Sue Bellamy
June Bowen △
Patricia Boyd
Charles N. Bracht

Donald Burrell
Rhett Butler
Petros Carvounis, MD
Steven D. Chipman
Kathryn Coleman
James T. Cox △
H. M. Crosswell, III
Judge Harold R. DeMoss, Jr.

Susan Dilg
Lee and Peggy Duggan
Marilyn Elliott
John Finch
Helen Fourmy
Slavka Glaser

+ Chairman
✧ Executive Committee
△ Deceased

Officers and Boards

Board of Advisory Trustees (con't)

Aileen Gordon	Howard & Margaret Marshall	Carl Schulse
Alan S. Gover	Del P. McCarthy	Gerald de Schrenck Sill
Rose Haché	Kent H. McMahan	Patricia J. Silverman
Henry R. Hamman	Mark Z. Miller	Judge John V. Singleton
William E. Harreld, Jr.	Suzanne S. Miller	J. Lockert Sleeper, Jr.
Walter H. Helmerich, III △	Ben Morton	Martha Ann Snyder
John L. Hopwood	Joanne Mueller	Dean J. Stuessy
Barbara Monroe Kirsch	William N. Noble	Sally R. Thomas
Fred L. Landry	Katharine T. Orton	Randy Thompson
Radford P. Laney	Michael Patrick	John Van Ramshorst, Jr. △
Frann G. Lichtenstein	Miriam R. Peterson	Lillian B. Wallace
Walter S. Lynn	Delores Frost Pranke	Peggy Weaver
Dean Malouta	James A. Reichert	Sally R. Winfrey
A. A. Margolin	Gail Rosenthal	
Barry Margolis	Gary Rosenthal	

Board of Scientific Advisors

Clinical Advisors

Milton Boniuk, MD
Richard W. Calhoun, MD
Amy G. Coburn, MD
Thomas E. Duncan, MD
Ralph O. Dunn, MD
Mary T. Green, MD
Alan Jarrett, MD
Robert T. McMahon, MD
Gerald M. Sheldon, MD
Sheppy J. Silverman, MD
John E. Sorrels, MD
Lawrence Wright, MD

Basic Science Advisors

John E. Dowling, PhD
David H. Hubel, MD
Torsten N. Wiesel, MD

Contributors

Benefactor

Patrons

\$100,000+

Benefactor Patron honors a total minimum commitment of \$100,000.

M. D. Anderson Foundation
Mr. and Mrs. Harry E. Bovay, Jr.
Ada Bond
Mr. and Mrs. Joe Brown
Mr. and Mrs. Donald J. Burrell
Rhett Butler
Laura I. Cannon
Ting Tsung and Wei Fong Chao Foundation
Margaret and Mills Cox
Louise Chapman
Davidson Family Charitable Trust
J.A. and Isabel M. Elkins Foundation
William Stamps Farish Fund
Fondren Foundation
Virginia Garrett
Mr. and Mrs. H. R. Gibson, Sr.
W. J. Gillingham
Harry B. and Aileen B. Gordon Foundation
Mr. and Mrs. A.G. Gueymard
The Hamman Foundation
Louise Hearn
Mr. and Mrs. W. H. Helmerich, III
The Helmerich Foundation
Houston Endowment, Inc.
Mr. and Mrs. Emmett A. Humble
Henry W. James
The Kayser Foundation
Janet Holmes Kelley



Dr. Ben Orman and Ames Smith



Roger and Elaine Beck with Mike Logan



*Delores and Dr. Madan Kulkarni with
Bernice and Dr. Bernie Hicks*

Contributors

Benefactor Patrons \$100,000+ (con't)

Robert J. and Helen C. Kleberg Foundation
Caroline W. Law
Joe M. and Eula C. Lawrence
Dominic Man-Kit Lam, PhD
W. O. Manning Foundation
M.D. Matthews Foundation
Alice R. McPherson, MD
I.L. and Bertha Miller Foundation
Lee C. Munke
Kathryn Murfee Endowment
Mr. and Mrs. William Noble
Mary K. Parr
Dorothy Portier
Gertrude D. Pyron
Burt L. Risley
Rockwell Fund, Inc.
Helen Sherwood
Fayez Sarofim and Co.
Edna Schlichting
Scurlock Foundation
Howard Sides
W.A. and M. W. Smith Foundation
Nelda C. and H.J. Lutcher Stark Foundation
T.L.L. Temple Foundation
Tenneco, Inc.
Mr. and Mrs. Robert C. Thomas
Turner Charitable Foundation
Nell Sue Tyson
Neva West Foundation
Mary Ellen Wilson



Paul Morrison with David and Camille Hailey



Joan and Ben Morton



*Kent and Donna Sollenberger, Dr. Danny Jacobs
and Dr. Bernard Godley*



Donald Squibb and Claire Curtin

Contributors

Sponsor Patrons \$50,000- \$99,999

June Carol Anderson
K. S. Adams Foundation
Eveline T. Boulafendis
Mr. and Mrs. S. J. Brochstein
Harry and Isabel Cameron Foundation
Clayton Fund
Cleo Butler
Ruth Conway
Mrs. William W. Crouch
Mr. and Mrs. John C. Dawson, Jr.
Mr. and Mrs. Robbin Dawson
Arthur and Billy Bob Draeger
Lillian H. and C.W. Duncan Foundation
The Ellwood Foundation
Hamill Foundation
William E. Harreld, Jr.
Wilton and Effie M. Hebert Foundation
Hofheinz Foundation
Nellie J. Howarth
Ralph A. Johnston Foundation
Mr. and Mrs. Robert Jenney

Kappa Alpha Theta
Mr. and Mrs. Alfred J. Knapp
KPMG Peat Marwick
O. P. Leonard, Sr.
Lyons Foundation
Eleanor McCollum
Ralph H. and Ruth J. McCullough Foundation
Anthony A. Mierzwa
Mr. and Mrs. Abraham Margolin
Mrs. Suzanne Miller
George Mitchell
Prue Minter
Milton Potts
Powell Foundation
RGK Foundation
Margaret Rome
Strake Foundation
Mr. and Mrs. Fred E. Wallace
Mr. and Mrs. S. C. Weil, Jr.
West Endowment

Supporting Patrons \$30,000- \$49,999

Mr. and Mrs. Elbert Adkins
Mr. and Mrs. August Bering, III
Mr. and Mrs. William A. Carl
Raymond Dickson Foundation
Delta Gamma Foundation (Houston)
Fifth Avenue Foundation
Mr. and Mrs. Thomas Fourmy
Mary C. Garner
James M. Gordon
Mr. and Mrs. Saunders Gregg
The Ewing Halsell Foundation
Exxon Company, USA
Hawn Foundation
Henderson-Wessendorff Foundation
Mr. and Mrs. Albert Herzstein
Joe Hill
Hobby Foundation
Jake and Nina Kamin Foundation
The Kelsey-Seybold Foundation
J. Hugh Liedtke

Mr. and Mrs. Ben Love
McGovern Fund
The Moody Foundation
Mr. and Mrs. Carl G. Mueller, Jr.
Gertrude Nichols
Harris K. and Lois G. Oppenheimer Foundation
Mr. and Mrs. French Peterson
Adele C. Pittman
Mr. and Mrs. John D. Schoolfield
Mr. and Mrs. J. L. Sleeper, Jr.
Mr. and Mrs. David H. Swain
Mr. and Mrs. A. Knox Tyson
John Van Ramshorst, Jr.
Mr. and Mrs. Luis F. Vegas
Mr. and Mrs. Larry P. Washington
Mr. and Mrs. J. P. Watson, Jr.
Mr. and Mrs. Henry O. Weaver
Dr. and Mrs. Arthur W. Willis, Jr.
Mr. and Mrs. R. Malcolm Wooley

Contributors

Patrons

\$15,000-

\$29,999

Mr. and Mrs. Thomas D. Anderson
Mr. and Mrs. W. Leland Anderson
Mr. and Mrs. Harry G. Austin
Ethel J. Beitler
Harry E. Bovay, Jr. Foundation
Patricia Boyd
Leon Bromberg Charitable Trust
Gordon and Mary Cain Foundation
Dr. and Mrs. Charles Campbell
Patricia Casey
JP Morgan Chase Bank
Josephine Collie
Corporate Staffing
Mr. and Mrs. Shelby T. Crosby
Mr. and Mrs. H. M. Crosswell, Jr.
Elizabeth Crouch
Mr. and Mrs. John C. Dawson, Sr.
Deluxe Check Printers Foundation
Mrs. R. H. Dwigans
Mr. and Mrs. Lou Ehlers
Evelyn Fleming
Ray C. Fish Foundation
Dr. and Mrs. C. H. Gillespie
Mr. and Mrs. Marcus Ginsburg
Mr. and Mrs. L. Henry Gissel, Jr.
Allen L. Goldman
Paul and Mary Haas Foundation
Mr. and Mrs. E. J. Hagstette, Jr.
Carlotta Hamilton
Minnie Harreld
Mr. and Mrs. Harvey Herd
Dr. and Mrs. Bernard Hicks
Earline Hubbel
Esther Janca
Mr. and Mrs. Dan Japhet
Mr. and Mrs. Willard M. Johnson
Kathryn Fraser Johnson
Carolyn H. Joseph
Mr. and Mrs. Baine P. Kerr
Barbara Monroe Kirsch
Mr. and Mrs. Palmer Long
Ben and Margaret Love Foundation
Bernece N. Luhnnow



Dr. Gary and Marion Glober



Nancy and Harley Robinson



Adelaide Biggs and Patricia Boyd

Contributors

Patrons
\$15,000-
\$29,999
(con't)

Mr. and Mrs. Morris D. Mahaffey
Mr. and Mrs. Dennis McCarthy
Menil Foundation
Mr. and Mrs. H. J. McKenzie
Mr. and Mrs. Vaughan B. Meyer
Huvian B. Morris
Mr. and Mrs. Charles P. Moreton
Dr. and Mrs. Robert A. Moura
N W D & H Corp.
Nation Foundation
Pennzoil Company
M. Q-Petersen
Kitty King Powell
Delores Pranke
Roy W. and Ellen S. Quillin Foundation
George A. Robinson IV Foundation
Mr. and Mrs. Craig M. Rowley
Mr. and Mrs. Sidney F. Sale
Sarah Joan Salisbury
Al Scheid
Kathryn A. Simpson
The Honorable John V. Singleton
Bob and Vivian Smith Foundation
Mr. and Mrs. F. Ames Smith
Phyllis Smith
Sooner Pipe and Supply
Beverly Stancliff
Mary Louise Steger
The Vale-Asche Foundation
Gladys Watford
Weir Foundation



Dean Stuessy and Keith Humble



Dr. James Solomon and Dr. Herb Lesser



Dean Malouta and Rose Haché with Ron and Bettie Lee

Contributors

Fellows \$5,000- \$14,999

Sam Aquilina
Mr. and Mrs. Reuben Askanase
Mr. and Mrs. Fred Bankston
The Barrow Foundation
Margaret Barrow
Battelstein Charities
Mr. and Mrs. Roger Q. Beck
Lloyd M. Bentsen Foundation
Mr. and Mrs. Elmer Berryhill
David C. Bintliff Foundation
Mr. and Mrs. Jack S. Blanton
Mr. and Mrs. I. S. Brochstein
Mr. and Mrs. Donald E. Brown
Mr. and Mrs. Earl A. Brown, Jr.
Mr. and Mrs. Thomas A. Burttschell
CAMCO, Inc.
Campbell Foundation
Mr. and Mrs. T. C. Campbell
Alonzo Cantu
Petros Carvounis, MD
Mr. and Mrs. John T. Cater
Marion Collett
Compaq Computer Foundation
Mr. and Mrs. Jack V. Cooley
Corpus Christi Exploration Co.
Mr. and Mrs. Jessie W. Couch
Mildred W. Davis
Mr. and Mrs. H. W. Davidson
Davis-Lynch, Inc.
Betty Debakey
Mr. and Mrs. Jake Dee
Clarence Dewey
George E. Duskocil
Dougherty Foundation
Mr. and Mrs. Lee Duggan
Avon Smith Duson
Earl C. Sams Foundation
Dr. and Mrs. Frank Eggleston
Elder Foundation
The R. W. Fair Foundation
Mr. and Mrs. Frederick C. Fehl
Foley's
Mr. and Mrs. Stephen Germick
Rose Getz
Mr. and Mrs. Miles R. Glaser
Mr. and Mrs. Aaron S. Gordon
Mr. and Mrs. Alan S. Gover
Mrs. J. Marshall Grier
Rose Haché and Dean Malouta
Mr. and Mrs. Michel T. Halbouty
Esther Hearne
Ernest G. Herman
Houston Biotechnology, Inc.
Houston Industries
Charles Jago Elder Foundation
Lee and Joseph D. Jamail Foundation
Louise L. Jamison
John L. Wortham and Son, L.L.P.
Willis J. Johnson
Philip Johnson
Junior League of Houston
Mr. and Mrs. Eugene Katz
Mr. and Mrs. Sol Katz
Mary E. Keith
Dr. and Mrs. James E. Key
William S. and Lora Jean Kilroy Foundation
Col. and Mrs. Richard Kimball
George D. Knodell
Albert C. McClain
Elton L. Krueger
Mr. and Mrs. Fred L. Landry
Mr. and Mrs. Radford P. Laney
Mrs. Ruth Lelsz
Dr. and Mrs. Herb Lesser
Margery Leonard
Lillian Kaiser Lewis Foundation
Mr. and Mrs. Palmer Long
Mr. and Mrs. C. M. Malone, Jr.
Mr. and Mrs. Barry Margolis
Martel Foundation
Frances P. McCauley
Mr. and Mrs. Albert C. McClain
Cappy McGarr
Mr. and Mrs. Clyde V. McKee, Jr.
Mary Louise McKee
Robert and Evelyn McKee Foundation
McPherson Associates
Mr. and Mrs. Nolen Mears
Mr. and Mrs. E. W. Merritt
Dorothy Miller
Mr. and Mrs. Mark Z. Miller
Harvin C. Moore, Jr.
Ruth Moriarty
The Nabisco Foundation

Contributors

Fellows \$5,000- \$14,999 (con't)

The Kathryn O'Connor Foundation
Mr. and Mrs. Dan Oppenheimer
Dr. and Mrs. Ben Orman
The Pembroke Fund
Mrs. C. O. Pollard
John E. Rambo
Lt. Col. and Mrs. Walter Records
Hattie Lel Red
Mr. and Mrs. George F. Reed
Lawrence S. Reed
Mr. and Mrs. Thearon J. Rhoads
Dr. and Mrs. Cecil C. Rix
Mrs. John E. Robert
Gail Rosenthal
RRF Fund Supplement
Mr. and Mrs. Charles Sapp
Lem Scarbrough, Jr.
Schlumberger Foundation
Mr. and Mrs. Carl H. Schulse
Mrs. Will Sears
John T. Shea Charitable Foundation
Mr. and Mrs. Barry Silverman
Dr. and Mrs. S. J. Silverman
Mr. and Mrs. Harry K. Smith
Mr. and Mrs. Frank C. Smith
Ruth W. Smith
Mr. and Mrs. Dean J. Stuessy
Mr. and Mrs. Richard H. Suman
Swalm Foundation
Henry J. N. Taub
Mr. and Mrs. Harold Teibel
Virginia Todd
Waddell Charitable Trust
Waggoners Foundation
Mr. and Mrs. H. Richard Walton
Mr. and Mrs. S. Conrad Weil, Sr.
Florence Welsh
The West Foundation
Mr. and Mrs. W. M. Wheless, II
Charla Hudson Wilson
Mr. and Mrs. John F. Woodhouse
Mr. and Mrs. James D. Woods
Zarrow Families Foundation



Barbara Kirsch and Jenifer Knight



Jon Strieby and Ames Smith



Patricia Boyd and Helen Fourmy

Contributors

Non Patron Donors 2012

Dr. and Mrs. Daniel Albert
Mr. and Mrs. Thomas Anderson
Mr. and Mrs. Ricardo Barrera
Kathy Bennett
Mr. and Mrs. Lynn Bernard
Charles N. Bracht
Mr. and Mrs. Russel Clark
Dr. Nansi Jo Colley
Mr. and Mrs. Mike Cotton
Mr. and Mrs. Jerry Davis
Judge Harold DeMoss
Mr. and Mrs. Frank Farese
Dr. and Mrs. Peter Forgach
Mr. and Mrs. Tom Foster
Carine Gendebien
Mr. and Mrs. Gilbert Haberer
Mr. and Mrs. Michael W. Haley
Mary Lou Hanzelka
Mr. and Mrs. Harry Hiers
Mr. and Mrs. Jimmie Horn
William D. Horton
Mr. and Mrs. Murray Hudson
Omer R. Humble family
Roxie Humble
Mary V. Jacobs
Dr. Golnaz Javey
Harold D. Jones
Thomas M. Jones
Mr. and Mrs. S. Roddey Keith
Mrs. Donald D. Kirby
Bettie H. Lee
Charles Mader
Mr. and Mrs. Nat L. Maggio
Robert Malinic
Edwin Manomohan
Connie Matthews
Mr. and Mrs. W. McAnelly, Jr.
Mr. and Mrs. John McCarver
Albert C. McClain
Mr. and Mrs. Ben Morton
Ann R. Neuer
Dr. T. Michael Nork
Mr. and Mrs. John S. Orton
Esther Oshman

Gretchen Ridge
Mr. and Mrs. Joseph W. Royce
Virgil Russell
Mr. and Mrs. Elliott Ryder
Mr. and Mrs. B. J. Sargent
Wanda J. Schaffner
Rose G. Schwedler
Mr. and Mrs. Thomas Simmons
Mr. and Mrs. Ed A. Stary
Mr. and Mrs. Gary K. Stenerson
David M. Thomas
Mr. and Mrs. Dalton H. Thurk
Gail Y. Walther
Lawrence E. Walton
Betty Whitt
Cherald E. Williams
Larry Wuebbels



Dr. Silvia Orenge-Nania and Troy Derouen



*Jo Claire and Henry Gissel, Dr. Ben Orman
and Barbara McKittrick*

In Memoriam

Board of Directors

Advisory Trustees

2010s	<p>Harry E. Bovay, Jr. Jake Kamin Carl G. Mueller, Jr. Cecil C. Rix, PhD</p>	<p>Eveline T. Boulafendis June Bowen William E. Carl James T. Cox James A. Elkins, III</p>	<p>Walter H. Helmerich, III Charles P. Moreton Helen Record John Van Ramshorst, Jr.</p>
2000s	<p>Thomas D. Anderson Harry Austin August Bering, III Miles Glaser Saunders Gregg E.J. Hagstette Baine Kerr Bertha Miller</p>	<p>Dorothy Adams Samuel Brochstein Donald E. Brown Earl A. Brown Lillian Cooley Lucylle Rowan Dawson Vernon W. Frost Margaret Gillingham Harry B. Gordon Ellen Gover Adolphe G. Gueymard</p>	<p>Michael Halbouty Esther Janca Willard M. Johnson Eleanor McCollum Vaughan Meyer Charles Milby Anthony Mierzwa Rush Record Richard Rolle Katherine Tyson JP Watson</p>
1990s	<p>James M. Barr Laura Lee Blanton Ted Bowen E.C. Japhet Alfred Knapp Fred Wallace Henry Weaver</p>	<p>Buck Arnold Faith Bybee Norman A. Binz Jack Cooley Marcus Ginsburg Mona Griswold Claire L. Johnson Elizabeth Jobst Albert P. Jones Max Levine Lee Loeffler</p>	<p>Winona Loeffler William O. Manning Harold J. McKenzie Robert E. Moroney James R. Ording Milton Potts Hattie Lel Red George Reed Selma Scheps Tom H. Wharton Herbert W. Varner</p>
1980s	<p>John C. Dawson, Sr. Arthur A. Draeger Donald Griswold Frank R. Jobst</p>	<p>Valient Baird Harry I. Battelstein Herbert R. Gibson, Sr Opie B. Leonard Aubrey C. Martindale Latimer Murfee R. Bryon Robinson</p>	
1970s	<p>Knox Tyson</p>	<p>Harold Link Joseph W. Robertson John H. Miracle</p>	



Lynn and Carol Bernard



Malcolm Wooley and Ron Webster



Rose Haché, Joanne Mueller and Dean Malouta



Retina Research Foundation
1977 Butler Boulevard
Houston, Texas 77030
713-797-1925

email: rrf@retinaresearchfnd.org
www.retinaresearchfnd.org