

**MCPHERSON**  
EYE RESEARCH INSTITUTE

**2018**

ANNUAL REPORT

**2019**

CALENDAR





# Dear Friends of the McPherson Eye Research Institute

Every year we discuss which research areas to highlight, and it is invariably one of our most enjoyable and difficult tasks. McPherson ERI investigators explore many different aspects of vision, develop cutting-edge technologies, and design novel therapeutics.

**Gene editing is a highly promising approach** that is likely to lead to dramatic advances in treating eye disease. As such, it is of great interest to our researchers and the many “hopeful patients” with whom McPherson Eye Research Institute scientists and staff regularly interact. Many live with progressive vision loss from diseases such as retinitis pigmentosa and severe age-related macular degeneration, where transformative therapies remain to be realized. The McPherson ERI exists to address this need by attacking every step of the process – from basic discovery to clinical trials.

**In addition to advancing the science and medicine of vision preservation and restoration, the Institute is remarkable in its dedication to understanding visual perception.** This commitment extends to the appreciation and celebration of the visual arts. Since its opening in 2014, the Institute's Mandelbaum & Albert Family Vision Gallery has brought more than a dozen outstanding vision- and science-related art exhibits to the Wisconsin Institutes for Medical Research (WIMR). This year's calendar features a fantastic range of artworks from past Vision Gallery shows. To the right, you'll meet two dedicated volunteers who curate these exhibits, bolstered by the creative energy and enthusiasm of fellow Vision Gallery Committee members. If you live in or visit Madison, we encourage you to stop by the 9th floor and enjoy the diverse and creative displays.

**In bringing together science and art, the McPherson ERI works to marry the *how* and the *why* of vision, and will continue to do so. As always, we're grateful for your help and support, and we wish you a wonderful 2019.**



**David M. Gamm, MD, PhD**

RRF Emmett A. Humble Distinguished Director  
Sandra Lemke Trout Chair in Eye Research



**Rodney Schreiner**

**“The Vision Gallery** is a window which affords views in both directions. It allows the public to see through the visual arts into the realm of vision science, and it provides vision scientists a view into varieties of artistic expression. Community visitors experience how artists use visual tools to communicate stories, evoke memories, and elicit emotions. Vision scientists witness how their expanding understanding of vision corresponds with the tools that artists use. The gallery brings scientists and laypeople together to explore links between science and the arts. Personally, I have been collecting art for over 50 years. By contemplating what in each work appeals to me, my collection has given me the opportunity to develop an understanding of my own perceptions and reactions – an opportunity the gallery provides both to me and to everyone who visits.”



**H. Adam Steinberg**

**“The best part** of this gallery is that we are able to engage scientific researchers with actual art that helps them understand the actual research they are investigating in their labs. The gallery helps researchers appreciate how humans ‘see’ – in all of the various ways we can define that word, from the physical to the emotional. Scientists need daily visual reminders why the work they do is so important to humanity.”

**CELEBRATING 5 YEARS**  
MANDELBAUM & ALBERT FAMILY VISION GALLERY



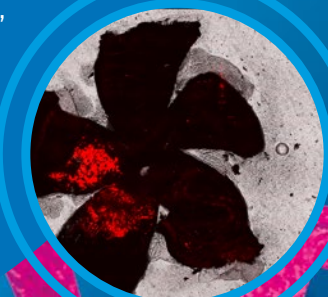
# Gene Editing

**Gene editing is emblematic of** what the McPherson Eye Research Institute does best – bringing together scientists from various disciplines to advance a cutting-edge field of research. As with other methods, our goal is to cure and treat blinding diseases. Gene editing has received much attention in the past few years, as it has greatly accelerated the “ease” and pace of lab work involving genetic manipulation. Using the gene editing tool CRISPR-Cas9, segments of genes can be “scissored” out from the larger genetic sequence, and potentially replaced (if necessary).

**Other types of gene therapy** have already moved to clinical trials. For instance, the FDA approved the first gene therapy for a rare, childhood-onset form of blindness last fall. Gene editing takes these therapies further, and offers hope in cases where standard gene therapy won't work. The investigations outlined on this page are a sampling of what is on our drawing board for genetic editing solutions in the foreseeable future.

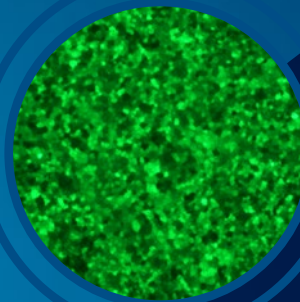
## Gene Editing with Nanotechnology

**In a collaboration** that brings together four McPherson ERI researchers, Krishanu Saha, PhD (Biomedical Engineering) will use a new approach to gene editing to correct mutations in retinal pigment epithelium (RPE) cells. Traditionally, viruses have been used to carry CRISPR-Cas9 editing “machinery” to cells, but there are downsides to this strategy. Saha, along with Shaoqin Sarah Gong, PhD (Biomedical Engineering), Bikash Pattnaik, PhD (Pediatrics), and David Gamm, MD, PhD (Ophthalmology & Visual Sciences), will test the capacity of state-of-the-art nanoparticles to deliver the machinery in mutated mouse models and patient-derived stem cell models in a dish. The project, supported by a UW2020 Award from the Wisconsin Alumni Research Foundation and a Gund-Harrington Award, aims to extend the spectrum of disease where genomic medicine could succeed.

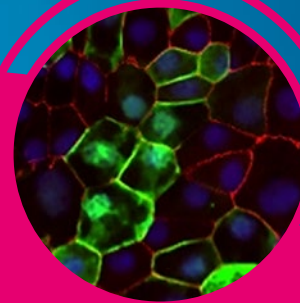


*RPE tissue from murine eyes that have been edited with CRISPR nanoparticles. Red indicated a gene-edited cell near the site of injection.*

*Best disease patient-specific stem cell-derived RPE cells expressing Cas9 (Cas9 expression is indicated by green color).*



*Restoration of the potassium channel protein (green) in diseased iPSC-RPE cells.*



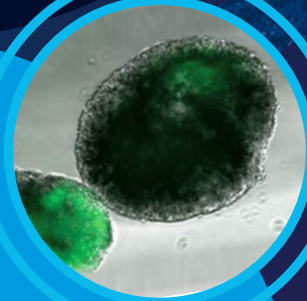
## Targeting Specific Genes

**There is no “one size fits all” solution** for faulty genes – each fix needs to be crafted for the specific “error” present in the patient's DNA. Bikash Pattnaik identified mutations in a potassium channel that is associated with Leber congenital amaurosis type 16 (LCA16), a childhood-onset blinding disease. Supported by gift funds and a grant from the National Eye Institute, Dr. Pattnaik and his McPherson ERI collaborators began by creating stem cell-derived RPE cells from patients with LCA16. These cells were used to understand the cause of the disease and to help the team develop gene therapy strategies. His lab then developed a mouse model of LCA16 to investigate whether particular drugs can overcome the gene mutation. Ambitious? Absolutely. Gene editing tools have magnificent potential, but like all tools, are dependent on the skill and foresight of the carpenter.

## Developing Gene Editing Therapies

**Best disease (BD)** is an inherited blinding disorder where patients progressively lose their central vision. The gene defect in BD causes improper formation of a cellular chloride channel that is required for normal RPE function. In a project involving the laboratories of David Gamm, Krishanu Saha, and Bikash Pattnaik, researchers tested the potential to use gene editing to treat BD using stem cell-derived ‘BD-in-a-dish’ models established by the Gamm lab. The research team, which also includes Divya Sinha, PhD, Benjamin Steyer, PhD, and Pawan Shahi, PhD, specifically targeted the defective copy of the gene to silence it. The strategy resulted in the complete restoration of chloride channel function, laying the groundwork for future clinical trials.

*Stem cell-derived 3D retinal tissue undergoing genome editing by the CRISPR system (cells undergoing genome editing show as green).*



## Quality Control for Gene Editing

**It is the foundation of** all medical procedures – “first, do no harm.” A new UW-Madison project, also led by Krishanu Saha and supported by a major collaborative award from NIH, will help ensure safety by testing gene editing's effects on human retinal tissues created from pluripotent stem cells. Researchers will examine photoreceptors in these tissues using specialized imaging techniques, and then develop biomarkers for greater safety using imaging and gene sequencing methods. This is a powerful cross-campus and McPherson ERI-wide collaboration, with retinal tissue developed in the Gamm Lab; imaging techniques developed by Melissa Skala, PhD (Biomedical Engineering); electrophysiology by Bikash Pattnaik, PhD (Pediatrics); bioinformatics by Sushmita Roy, PhD (Biostatistics & Medical Informatics); and single cell analysis by Rupa Sridharan, PhD (Cell & Regenerative Biology).

MCPHERSON ERI

# Scientists & Friends



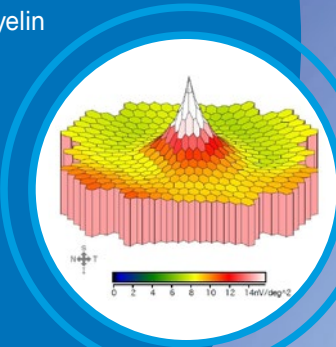
## James N. Ver Hoeve, PhD

- Ophthalmology and Visual Sciences
- School of Medicine and Public Health

**To assess visual function** in non-verbal pediatric and adult patients as well as in basic research, Dr. Ver Hoeve uses non-invasive electrophysiologic measures: the electroretinogram (or ERG – the retina's electrical response to light) and visually evoked potential (or VEP – the response of the brain to visual stimulation). Because the electrical response of the retina is altered by genetic disorders in a similar way across species, Dr. Ver Hoeve can use electroretinography to assess visual function and dysfunction in both humans and animals. As a clinician-scientist, his current research interests include glaucoma, gene therapies, and disorders of myelin (a nerve cell insulator).

**Translating the results** of experimental treatments to cure eye diseases is greatly aided by the ERG. He has used the ERG to predict the safety and efficacy of numerous experimental eye drugs including gene-therapy for achromatopsia, the complete loss of color vision. In the clinic, the ERG is used to detect many different problems in retinal function, including inherited retinal diseases and drug toxicities.

**The VEP is used to detect and manage** pediatric vision problems including cataract and strabismus, which require intervention to prevent amblyopia ('lazy eye'). It is also a valuable tool in discerning vision health in developmentally delayed children. Dr. Ver Hoeve's expertise with these tools makes him a valued research collaborator.



*A multifocal ERG recording from a human, at risk for vision loss due to a medication for rheumatoid arthritis. The sharp central peak corresponds to the increased sensitivity of the fovea.*

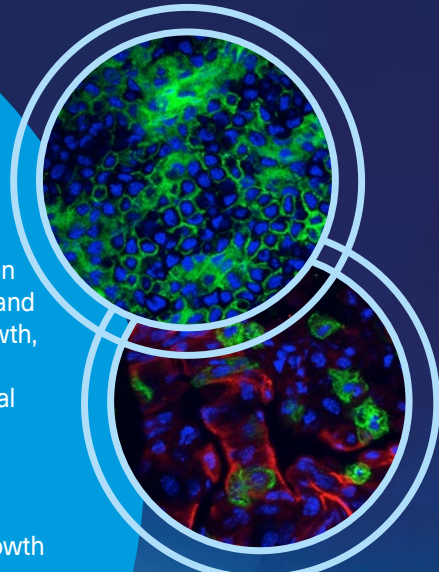


## Sakae Ikeda, DVM

- Medical Genetics • School of Medicine and Public Health

**As the main refractive element** of the visual system, the cornea functions optimally when its surface is smooth and when it remains transparent and blood vessel-free. But a wide variety of infectious and inflammatory eye diseases can induce corneal scarring and blood vessel growth, comprising a major cause of blindness worldwide and underscoring the need for animal models of corneal diseases. Such models provide useful experimental systems for understanding the pathways underlying the normal maintenance of corneal integrity and function, as well as the causes of abnormalities.

**Dr. Sakae Ikeda uses a unique mouse model**, corneal disease 1 (corn1), that displays thickened epithelia, inflammation, and unwanted new blood vessel growth in the cornea. She and her research group identified that lack of the protective gene destrin—essential in regulation of the actin filament supporting cell structure and organization—results in the ensuing abnormal activation of the protein SRF. These paired factors are responsible for all corneal abnormalities observed in this mouse model. Understanding cellular and molecular changes that occur in the corneal surface in mice due to SRF activation will advance understanding of the causes of corneal disease in humans as well.



*Cells from a normal mouse cornea (green, top) contrasted with abnormal, thickened cells from a diseased cornea (red).*



## Yao Liu, MD

- Ophthalmology and Visual Sciences
- School of Medicine and Public Health

**As director of the** Teleophthalmology for Diabetic Eye Screening Program, Dr. Yao Liu is working to improve access to diabetic eye screening for rural patients in order to prevent the blindness that can occur as a result of diabetic eye disease – the leading cause of blindness in working-age Wisconsin adults. Early detection and treatment are essential to avoid severe vision loss, and this pioneering program helps patients to get vision screening that is often hard to obtain in rural areas with limited medical services. This is the Wisconsin Idea in action, using university resources to advance vision health statewide.

**As part of this program**, specialized cameras are provided in primary care clinics so that patients with diabetes can be screened at their regular appointments. Photos of a patient's retina are sent electronically to UW eye doctors in Madison to check for diabetic eye disease. People needing treatment are rapidly scheduled with a local eye doctor in their community. In this way, Dr. Liu and her team have joined forces with rural patients and primary care doctors to better integrate teleophthalmology in primary care clinics, with the goal of increasing diabetic eye screening rates to the 90th-percentile nationally.



## Gary Doering

**People notice Gary Doering's presence**, and sense of humor, very quickly. Gary is a natural leader, and for years served as moderator of the retinitis pigmentosa support group at the Wisconsin Council of the Blind and Visually Impaired (organized by Jean Kalscheur at the Council). His Cycle for Sight team, Blind Take Off – co-captained by Jim Tormey and Gerard Xavier – frequently helps with event publicity. Although he loves to joke, Gary has certainly had down times over the progression of his blindness. He credits others for getting him through – from the young woman who helped tape his broken cane together after he'd smashed it in frustration at an early DVR-sponsored retreat, to mobility trainer Marshall Flax (who helped Gary get around Baraboo and had the original idea for the RP support group), to the friend who hired him at Badger Paperboard after his previous job became too dangerous. But Gary has been determined to pay that assistance forward.

**He first noticed that his night vision** was worse than his teammates' while playing high school football. In his mid-20s, he started colliding with other guys on the basketball court. Gary was 27 when diagnosed with retinitis pigmentosa. Deterioration was slow over the next 15 years, but sped up in his forties, leading to near-total blindness, frustration, and that cane-smashing moment at a Wausau educational session. "That young lady came over and asked if I was okay – broke the cane, huh? – now what are you gonna do?" She handed Gary the athletic tape and said, "None of us want to be here – it's just who we are & what we have." "I told myself, it's time to get over it," Gary says.

**Since then, Gary's life has filled with many things**, including music as a fervent concertgoer and performer. He sings in three choirs, including the Barabrew, Wisconsin Beer Choir – "We drink beer while we rehearse, we drink beer while we perform – every song has a beer reference. We get some real nice participation...." He enjoys talking with his dozens of work clients, and he's mad about his family – wife Sherry, son Chris and daughter-in-law Sasha, grandson Kyan, 3, and new granddaughter Braya. He speaks to a 4th grade class about his blindness every year – "I love the questions that I get."

**Gary has long supported vision research** at the McPherson ERI – "You guys are doing great things, an hour from where I stand right now." What does he hope for? "If I could see color again, that would be awesome. I'd love to see my grandchildren's faces, but even if I could see the color of their hair... I don't need the whole fix, but if I could see a blue sky, or the water at Devil's Lake." He knows it won't come overnight, but "I'm very optimistic that there are going to be big changes – not only for people with blindness, but for other diseases too."



HOPEFUL PATIENT

Eyes of a mayfly.



## Leandro B. C. Teixeira, DVM, MS

- Director, COPLOW • Pathobiological Sciences
- School of Veterinary Medicine

**As the director** of the Comparative Ocular Pathology Laboratory of Wisconsin (COPLOW), a world-renowned pathology laboratory that receives ocular tissues from many animal species and that harbors one of the largest ocular collections in the world, Dr. Teixeira manages more than 63,000 eye specimens ranging from insects to whales. The COPLOW lab is also a premier diagnostic pathology laboratory which provides services to veterinary ophthalmologists from all over the world.

**As a veterinary pathologist**, Dr. Teixeira focuses his research on the comparative aspects of animal and human ocular diseases. While his research involves assessment of the form and structure of retinal blood vessel diseases as well as comparative aspects of spontaneous ocular disease in animals, his main research interest is the study of the extracellular matrix (connective tissue) of the eye, and how changes in these matrices influence diseases like glaucoma and lens displacement in both animals and people.

## Daniel M. Lipinski, DPhil

- Ophthalmology and Visual Sciences • Medical College of Wisconsin

**Dr. Daniel M. Lipinski** directs the Ocular Gene Therapy Laboratory and is dedicated to the development of safe and effective gene therapy treatments to prevent vision loss in patients suffering from neurodegenerative or vascular (blood vessel) diseases affecting the eye. Since the early stages of his career, Dr Lipinski's research program has focused on the design of strategies to prevent death of cone photoreceptors – which are critical for daytime vision, color discrimination, and depth perception – in rare, inherited diseases such as retinitis pigmentosa and Usher syndrome.

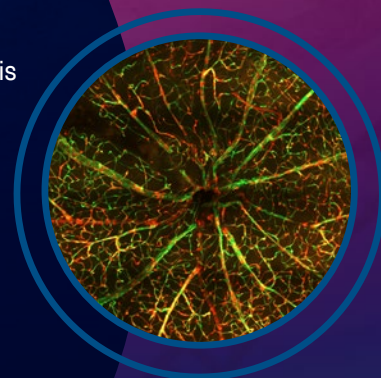
**More recently**, Dr. Lipinski has spearheaded the development of long acting, single-use gene therapy treatments to preserve vision in patients with highly prevalent, complex ocular diseases such as diabetic retinopathy, age-related macular degeneration, and glaucoma.

**With grant funding from** the National Eye Institute and Foundation Fighting Blindness, Dr. Lipinski is committed to furthering vision science research by providing purified recombinant adeno-associated virus (rAAV) vector preparations—essential for successful gene delivery—and expert guidance on their use to collaborators worldwide.



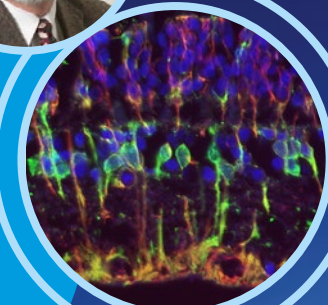
RESEARCHER

Retinal vasculature of a mouse, showing endothelial cells (green) and pericytes (red), which become abnormal in diabetic retinopathy.



## Curtis Brandt, PhD

- UW Medical Foundation Professor • Ophthalmology and Visual Sciences
- School of Medicine and Public Health



**Gene therapies can only succeed** when genetic changes are successfully delivered to the targeted cells. Dr. Curtis Brandt and his lab are studying various gene delivery strategies for ocular diseases, to better understand those that work – and equally importantly, those that may have negative effects. Recently they have shown that several types of viral delivery vector induce a transient inflammatory response (uveitis) when injected into non-human primate eyes. Although temporary, this undesirable side effect could negatively impact the gene therapy. The long-term goal of their work is to identify the mechanisms causing uveitis and develop ways to block it.

**Uveitis begins within 24 hours of vector delivery**, indicating that the inflammation trigger involves various sensor proteins that recognize components of the delivered viruses. The Brandt lab has shown that all 10 members of one of these sensor families, known as Toll-like Receptors (TLRs), are expressed in retinal cells. (In the accompanying image, the yellow shows TLR10 being expressed in Müller cells, which support retinal neurons). Blocking these sensor signals may be one approach to eliminating the unwanted inflammation.

RESEARCHER

RESEARCHER

## Gary Lupyan, PhD

- Psychology • College of Letters and Science



**Gary Lupyan is a cognitive scientist** with an interest in how what we see is shaped by what we know and expect. His interest in the visual bases of cognition is one aspect of his group's multifaceted work, along with broader questions of language function, origin, and connections to perception.

**Human vision is highly constructive.** Our visual system takes information from the outside world and combines it in complex ways with our long-term knowledge and our in-the-moment expectations. A perceptual system that is influenced by various kinds of information (including non-visual information) can be much "smarter" than a system that simply reacts to current visual input. For example, our knowledge that pumpkins are normally orange increases our sensitivity to detecting off-colored pumpkins; likewise, our visual knowledge of what various words look like can help us see their constituent letters. Understanding the extent to which vision is influenced by such factors can help us understand how people with different prior experiences and expectations can look at the same thing and see it differently.

*In a recent study, Dr. Lupyan found that when blurred letters are arranged into meaningful words, they are perceived as being sharper than when the same letters do not make up real words.*

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## HOPEFUL PATIENT

## Melinda Dresen



**Melinda Dresen knew early** on that she wasn't going to be a game warden for the DNR, as she'd hoped. Diagnosed with juvenile macular degeneration in the third grade, she nevertheless majored in resource management and environmental sciences at UW-River Falls, and continued to kayak and hike as her vision worsened. Her sight deteriorated in steps, every 3-5 years. Ten years ago she started using a cane, working with McPherson ERI Advisory Board member Marshall Flax, as she has since third grade. ("Marshall gave me my first magnifier – When he put it in the book, it opened my world back up.") Her vision now is "like a digital photo if you blow it up to where it's pixilated, or like old-fashioned TV snow, with no center vision and random blind spots on the periphery."

**In her job as Housing Resource Specialist** at the Tenant Resource Center in Madison, Melinda works with many people in need of assistance and advice. (This was also true of her previous job, as site manager at Dryhooch in Madison, a nonprofit which assists veterans in adjusting to the return home). Blindness has motivated her to support others. "I kinda recognize that you have a path in life – things happen for a reason to help you become the person that you're supposed to be. It's not a punishment, it just helps you become a better person. I would not be as compassionate a person if it weren't for the challenges that I've had in my life."

**Melinda rode in Cycle for Sight this year** and is hopeful about the research. "It's absolutely fascinating – the thought that the next little 8-year-old will not have to go through some of the challenges that I've had to deal with – that they'll have different options in life – is amazing and just a relief." She's not passively waiting for change to happen. She remains active, taking her dog to the dog park and participating in adaptive climbing sessions at Boulders Gym. She expects her vision to worsen every few years – "You have to have a good sense of humor. When I start going through a decline, I tell people, I'm gonna bump into stuff. I can choose to find it funny, or not. I used to have a supervisor who was totally blind, and his big thing was 'You can be bitter or you can be better.'" Her message? "Most folks who are blind or visually impaired have very full, productive lives. Most are not sitting in a room waiting for life to happen to them – we're out in the world doing it. It may look different than we've thought. Does my life look different from that which my mom had imagined when I was a baby? It's okay, I'm still making it happen."



# CELEBRATING 5 YEARS

## MANDELBAUM & ALBERT FAMILY VISION GALLERY

Family members in whose honor the gallery is named include (from left) Eleanor & Daniel Albert; David & Karen Mandelbaum.



Intended to promote the interdisciplinary study of vision in the UW-Madison community and beyond, the Mandelbaum & Albert Family Vision Gallery serves as an active link between science, arts, and the humanities—providing a collaborative context for scientists, artists, and curators working at the intersections of visual art, visual processing, and vision science.

The creative, innovative, and dedicated people who have served with the Vision Gallery Committee during its first five years – designing and installing 14 exhibitions since March 2014 – have advanced McPherson ERI partnerships with UW Communications, Tandem Press, the Waisman Center, UW Zoological Museum, VSA Wisconsin, and Artworking, along with numerous individual artists on campus and in our community and state!

### VISION GALLERY COMMITTEE



Eleanor Albert   Kate Baldwin   Ken Frazier   Martha Glowacki   Shiela Reaves   Rodney Schreiner   H. Adam Steinberg



### CURRENT EXHIBITION

## 2018 COOL SCIENCE IMAGE CONTEST EXHIBITION

September – December 2018

Showcasing winning images from UW Communications' annual all-campus image contest

## ENDOWED CHAIRS & PROFESSORSHIPS AT THE MCPHERSON EYE RESEARCH INSTITUTE



Retina Research Foundation Emmett A. Humble Distinguished Directorship

**David M. Gamm, MD, PhD**

Director, McPherson Eye Research Institute • *Modeling and Treating Retinal Disease with Human Induced Pluripotent Stem Cells (hiPSCs)*

Sandra Lemke Trout Chair in Eye Research  
*Applications of stem cell technology to the study and treatment of age-related macular degeneration*



Retina Research Foundation Walter H. Helmerich Research Chair

**Kevin Eliceiri, PhD**

Associate Director, McPherson Eye Research Institute • *Computational and Optical Approaches for Visualizing the Cellular Microenvironment of the Eye*



Retina Research Foundation Daniel M. Albert Chair

**Barbara A. Blodi, MD**

*Adaptive optics imaging of human retinal function*



Retina Research Foundation Kathryn and Latimer Murfee Chair

**T. Michael Nork, MD, MS**

*Functional and Cellular Mechanisms of Ischemic Retinal Injury*



Retina Research Foundation Edwin and Dorothy Gamewell Professor

**Jeremy Rogers, PhD**

*Optical Instrumentation and Technology Platforms for the Study and Screening of Retinal Disease*



Retina Research Foundation M. D. Matthews Research Professor

**Bikash Pattnaik, PhD**

*Vision Loss Due to Ion-Channelopathy*



Retina Research Foundation Rebecca Meyer Brown Professor

**Mrinalini Hoon, PhD**

*How Synaptic Connections 'Wire' the Developing and Diseased Retina*



Timothy William Trout Professorship in Eye Research

**Akihiro Ikeda, DVM, PhD**

*Identification of Genetic Factors Affecting Aging of the Retina*

### Walsh Family Establishes New Vision Research Professorship



The chairs and professorships listed above will soon be joined by a new endowed position! In January 2018, the Walsh family, along with Dr. Alice McPherson and John and Tashia Morgridge (in a matching gift), pledged to establish the David and Nancy Walsh Family Professorship in Vision Research. This new professorship will be held by "a member of the McPherson Eye Research Institute in any school or department who is performing cutting-edge vision research." We are grateful to David and Nancy and their entire family, who are long-time friends of the Institute and dedicated champions of vision research (David Walsh served as the first chairman of the McPherson ERI Advisory Board).



## MCPHERSON EYE RESEARCH INSTITUTE

# Advisory Board 2017-2018

### **Daniel M. Albert, MD, MS**

*Founding Director, McPherson ERI*

### **Rose Barroilhet, Chair**

*Director (retired), UW-Madison Space Management*

### **Petros E. Carvounis, MD**

*Macula Vitreous Retina Physicians & Surgeons*

### **Marv Conney**

*CEO (retired), Conney Safety Products*

### **Paul M. DeLuca, Jr, PhD**

*Emeritus Provost, UW-Madison;  
Emeritus Professor, Medical Physics*

### **James E. Doyle, JD**

*Foley & Lardner LLP; Governor  
(former), State of Wisconsin*

### **Marshall Flax, MS, CLVT, COMS**

*Fork in the Road Vision Rehabilitation Services*

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General Library System*

### **Don R. Gray, PhD**

*Vice-President (retired), UW Foundation*

### **Carl E. Gulbrandsen, PhD, JD**

*Emeritus Managing Director,  
Wisconsin Alumni Research Foundation*

### **Kazuyoshi Hirao, MBA**

*CEO, Opsis Therapeutics  
COO, Fujifilm Cellular Dynamics*

### **Alice R. McPherson, MD**

*President, Retina Research Foundation*

### **Nancy Mills, JD**

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Marquette University Mediation Clinic*

### **Harry Roth, MD**

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### **Jay Smith**

*Chairman, TEEL Plastics*

### **David Steffen**

*State of WI Representative*

### **David G. Walsh, JD**

*Foley & Lardner LLP*



## Nancy Mills

"I believe eyesight is the facilitator in most human endeavors, and it is of the utmost importance to me personally. 'Preventing and curing blindness,' the core mission of the McPherson Eye Research Institute, is what drew me to this effort in the visual sciences. It is gratifying to experience the enthusiasm of scientists and scholars who are truly interested in working with each other, sharing their findings, and assisting each other in the development of ideas. It is in this atmosphere of cooperation that the greatest advances in biomedicine can be made and ultimately make significant differences for the greater good. The McPherson Eye Research Institute is truly the leader in making this difference."



## Marshall Flax

"If you follow the idea of sifting and winnowing to its logical extreme, you arrive at the McPherson Eye Research Institute. It is a 'place' where the subject of vision is considered from as many points of view and from as many disciplines as our current state of knowledge can manage. I believe that it is this broad consideration of what vision is, and how it can be studied, that makes the Institute so powerful and so unique."

## Carl Gulbrandsen

"I've known and admired Dr. David Gamm for many years. In just the short time I've been on the advisory board, I've been even more impressed by David's leadership and the support Dr. Alice McPherson and the Retina Research Foundation provide in pursuit of the McPherson Eye Research Institute's mission to prevent and cure blindness. The researchers engaged in the institute are of the highest caliber, and the research they are engaged in is simply amazing. All of them are mission-focused and committed to reaching that goal of curing and preventing blindness. As an advisory board member, to be able to help them achieve that goal is a great honor."



IN MEMORY & HONOR

## Emmett A. Humble

[1925-2018]

*McPherson ERI Advisory  
Board, 2007-2014  
Honorary Board 2014-2018*



## MCPHERSON EYE RESEARCH INSTITUTE

# Leadership Committee 2017-2018

### **Barbara Blodi, MD**

*School of Medicine and Public Health*

### **Kevin W. Eliceiri, PhD**

*Associate Director, McPherson ERI  
College of Engineering  
Morgridge Institute for Research*

### **David M. Gamm, MD, PhD**

*Director, McPherson ERI  
School of Medicine and Public Health*

### **Akihiro Ikeda, DVM, PhD**

*School of Medicine and Public Health*

### **Andrea H. Mason, PhD**

*School of Education*

### **Gillian McLellan, BVMS, PhD, DACVO**

*School of Veterinary Medicine  
School of Medicine and Public Health*

### **Bikash Pattanaik, PhD**

*School of Medicine and Public Health*

### **Shiela I. Reaves, MA**

*College of Agricultural and Life Sciences*

### **Bas Rokers, PhD**

*College of Letters and Science*

### **Vikas Singh, PhD**

*School of Medicine and Public Health*

# Honorary Advisory Board Members

### **Darrell Behnke, JD**

*Director, Private Client Reserve,  
U.S. Bancorp*

### **Oscar C. & Patricia Boldt**

*The Boldt Company*

### **Derilyn Cattelino**

*Philanthropist*

### **Erik Christianson**

*External Affairs, NCAA*

### **Alan R. Morse, JD, PhD**

*President & CEO, Lighthouse Guild*

### **Dr. Monroe & Sandra Trout**

*Philanthropists*



CELEBRATING THE  
**RETINA RESEARCH  
FOUNDATION'S**

**50<sup>TH</sup>  
ANNIVERSARY!**

**In 2019**, the Houston-based Retina Research Foundation – founded by Dr. Alice McPherson in 1969 – will reach its 50th Anniversary. We would like to congratulate the RRF, Dr. McPherson, and its Board of Directors on this landmark.

**As its mission statement indicates**, the Retina Research Foundation was established to further a critical goal: “to reduce retinal blindness worldwide by funding programs in research and education.” For 50 years, its name has been synonymous with outstanding retinal research. As Dr. Paul Sieving, Director of the National Eye Institute, noted at an RRF 45th Anniversary Celebration (hosted by the McPherson ERI in 2014), “Private monies, such as the Retina Research Foundation provides, are vital, as these are strategic funds that are nimble and allow investigators to explore the cutting edge and to go into the unknown.” These goals are shared by the McPherson Eye Research Institute, which was founded with Dr. McPherson's assistance and guidance in 2005. In the years since then, members of the RRF Board of Directors have visited Madison multiple times in order to discuss and advance our common goals. We are thrilled to join in recognizing Dr. McPherson and the RRF for their incredible achievements and profound impact on vision science.



*Retina Research Foundation board members on a visit to Madison. L-R: Ron Giroto, Dr. David Gamm, John Dawson, Dr. Jim Key, Dr. Alice McPherson, Dr. Ben Orman, Dr. Bernard Hicks, Ames Smith, Dr. Petros Carvounis, Dr. Frank Eggleston*



*Vision scientists honoring the Retina Research Foundation on its 45th anniversary included, L-R: Drs. Daniel Albert, Matthew “Dinny” Davis, Alan Bird, Alice McPherson, Nansi Colley, David Gamm, John Dowling, and Paul Sieving.*



**LEFT:** L-R, Arthur Polans, John Dawson  
**RIGHT:** L-R, Dr. Frank Eggleston, Dr. Monroe Trout, John Dawson

**Dr. McPherson's  
Gonin Medal on  
permanent display  
at UW-Madison**



The Gonin Medal, the premiere international award in ophthalmology, given only once every four years, was presented to Dr. Alice McPherson in 2014.

**The award recognized** Dr. McPherson's work in pioneering scleral buckling procedures, cryotherapy, and xenon arc and laser photocoagulation in the treatment of retinal detachment. Dr. McPherson was an early and vigorous advocate of photocoagulation in the treatment of diabetic retinopathy, a controversial position that was later proven correct by a large, randomized NEI study.

**In 2018**, Dr. McPherson donated her Gonin Medal, along with the Gonin Certificate and supporting documentation, to the UW-Madison University Archives. As part of the Archives' collections, it joins historical materials from other distinguished UW alumni. The Gonin Medal will remain on permanent display in the home laboratories of the McPherson Eye Research Institute as an inspiration to the Institute's vision researchers. A dedication ceremony was held in April 2018, with Dean Robert Golden welcoming both McPherson ERI and Retina Research Foundation board members to view the Medal in its new home.





SAVE THE DATE

# CYCLE FOR SIGHT 2019! MARCH 9 2019

at the Princeton Club West,  
Capital Fitness, and the UW  
Natatorium.

More information is at  
[vision.wisc.edu/cycle](http://vision.wisc.edu/cycle)



**Cycle for Sight raised just over \$56,000 for vision research at UW Madison,** again surpassing last year's fundraising total and participation. 2018's prizewinning teams have led the pace in fundraising for several years, with Kenzi's Team again in the lead. Riding in honor and in memory of Kenzi Valentyn – and with one group of riders participating in Malaysia! – Kenzi's Team raised almost \$20,000. Blind Take Off was again in second place, followed by Out of Sight and the Retinal Research Allstars (riding in memory of vision scientist Randie Schlamp).

**Funds from Cycle for Sight support a variety of research awards and programs.** We are particularly pleased to announce that 2019 will be the first year that we will present the newly-named Kenzi Valentyn Vision Research Trainee Grants. After competitive review, these awards will be given annually to outstanding selected graduate student and postdoc vision researchers. We're very grateful to the Valentyn family for their powerful support for vision research. And we're grateful to ALL of our Cycle for Sight participants, donors and sponsors for growing this event and advancing vision research at the McPherson ERI.



D. Dan Huh, PhD

## LECTURES HELD IN 2018



Jeremy M. Wolfe, PhD

### 6TH ANNUAL MCPHERSON ERI ENDOWED LECTURE

**"Microengineered physiological biomimicry: Human Organs-On-Chips"**

**HELD MAY 22, 2018**

**D. Dan Huh, PhD**

*Department of Bioengineering  
University of Pennsylvania*

### 10TH ANNUAL VISION SCIENCE LECTURE

**"OMG, I did not see that!"**

**The science of missing what is right in front of our eyes"**

**HELD OCTOBER 16, 2018**

**Jeremy M. Wolfe, PhD**

*Ophthalmology & Radiology | Harvard Medical School  
Visual Attention Lab | Brigham & Women's Hospital*





# WITH THANKS AND APPRECIATION

TO THE FOLLOWING \$40+ CONTRIBUTORS TO  
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For more information on how to partner with the McPherson Eye Research Institute in support of research, education and treatment advances in the visual sciences, please contact us.

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