ERI InSights
The Eye Research Institute University of Wisconsin- Madison
February 2010

ERI UPDATES/ANNOUNCEMENTS

Welcoming New Members

Within the past six months, twelve new members have enriched the ERI with novel perspectives and collaborative opportunities. **Leigh Ann Mrotek, PhD** (Kinesiology) and **Dana Vaughan, PhD** (Biology & Microbiology), both at UW-Oshkosh, responded to the ERI membership invitation that has been extended to faculty doing vision-related work and research at other UW System campuses. The following individuals from UW-Madison have become ERI members:

Members:	**Ellen Cook, PhD** (Medicine)
	Xin Huang, PhD (Physiology)
	Michael Ip, MD (Ophthalmology & Visual Sciences)
	Bilge Mutlu, PhD (Computer Sciences)
	Todd Perkins, MD (Ophthalmology & Visual Sciences)
	Vanessa Simmering, PhD (Psychology)
	James Stahl, PhD (Medicine)
	Tom Yin, PhD (Physiology)
Associate Members:	**Thomas Hart** (Veterinary Medicine)
	Erica Rosenbaum (Ophthalmology & Visual Sciences)

Associate Membership Opportunity

Did you know that a category of associate membership exists in the ERI, encouraging wider interaction and exchange with graduate students, postdoctoral fellows, staff and community members who have vision-related interests and involvements of any kind? Membership applications can be requested from Tracy Perkins: tdperkin@wisc.edu

COMING EVENTS

ERI Seminar Noon to 1:00pm, February 9

De-Ann Pillers, MD, PhD (Pediatrics) and **Nader Sheibani, PhD** (Ophthalmology & Visual Sciences) will present clinical and laboratory perspectives as they discuss "Retinopathy of prematurity: from pathogenesis to mechanism" at Clinical Science Center G5/134. RSVP for pizza lunch by Monday, February 8: gmstirr@wisc.edu
*Full Spring Semester Seminar Schedule: http://www.vision.wisc.edu/events.html

ERI Seminar Noon to 1:00pm, March 9

Marshall Flax, MS, CLVT, COMS (Wisconsin Council of the Blind & Visually Impaired) and **Andrew Greenberg, PhD** (Chemistry, Nanoscale Science & Engineering Center) will talk about "Meeting needs for the blind and visually impaired." They will share their respective experiences supporting adaptations that advance independence, mobility and education. Come to Room 1360 Genetics/Biotechnology Building on Henry Mall. RSVP for pizza lunch by Monday, March 8: gmstirr@wisc.edu

Save the Date for an ERI Outreach Event at Henry Vilas Zoo!

On Sunday, May 23, 2010 (9:00am to 11:00am), join Zoo staff and ERI members **Dick Dubielzig, DVM** and **Ellison Bentley, DVM** for a program called ***Vision at the Zoo: A Bird's Eye View***. Adults and accompanied children are invited to meet an owl, penguin and macaw and learn about their eyes. Advance registration is required and opens March 1st. Additional detail is available at the ERI website: www.vision.wisc.edu.

FACULTY, STAFF & AFFILIATE ACCOMPLISHMENTS

Chazen Provides Internship Opportunity

Ph.D. candidate **Matthew Rarey** (Art History), an ERI associate member, was awarded the Chazen Museum of Art's Graduate Curatorial Internship for the 2009-2010 academic year. He is working with Chazen Director Russell Panczenko to plan, curate and execute a novel installation of the Chazen's collection of African art for the museum's new wing opening in 2011. Rarey's research investigates the relations between human visual perception, multisensory experience, and artistic production, focusing on performance arts of the African diaspora in Latin America.

Faculty Recognized for Teaching

Selected at the close of Fall Semester by students living in University Housing residence halls, ERI members **Nicola Ferrier** (Mechanical Engineering), **Shiela Reaves** (Life Sciences Communication) and **Jerry Zhu** (Computer Sciences) have been recognized as Honored Instructors. This program gives students an opportunity to acknowledge and pay tribute to those who have made a meaningful impact on their undergraduate education—those whose approach to teaching promotes not only learning and intellectual development, but also student engagement and connectedness. We are fortunate to have such dedicated, student-oriented faculty training and inspiring our next generation of researchers.

Romnes Faculty Fellowship Supports Research

Brad Postle (Psychology) is the recipient of a 2010 Romnes Faculty Fellowship, awarded to recognize great potential in faculty who have earned tenure within the last four years. Supported by the Wisconsin Alumni Research Foundation (in honor of H.I. Romnes, former president of the WARF board of trustees), this fellowship provides $50,000 of flexible research funding over the next five years. Postle's work focuses on human memory and cognition, including the cognitive and neural bases of visual working memory, visual attention, control, intelligence, and nondeclarative memory. With colleagues in psychology and in the HealthEmotions Research Institute (Psychiatry), he uses behavioral studies, functional magnetic resonance imaging (fMRI), transcranial magnetic stimulation (TMS) as well as repetitive TMS, and electroencephalography (EEG).

RESEARCH NEWS

Of Mice and Men: Genetic Roles in Lens Development

Anne Griep (Anatomy) and her research team have discovered that *Discs large-1 (Dlg-1*), the mouse homolog of *Drosophila* (fruit fly) tumor suppressor gene, *dlg*, is necessary for the proper formation and clarity of the lens. Using genetically modified mice that are deficient for *Dlg-1* only in the lens, the team has learned that this gene is necessary for proper cell adhesion, shape and polarity in lens development. Furthermore, as lens opacities develop in these *Dlg-1* deficient mice, the findings increase our understanding of mechanisms involved in cataract formation. Ultimately, *Dlg-1*, related factors and the cell adhesion pathways they regulate may be targets for therapeutic intervention to delay and/or prevent cataract. The studies were described in "Cell-autonomous requirements for *Dlg-1* for lens epithelial cell structure and fiber cell morphogenesis," in the September 2009 issue of *Developmental Dynamics*—a special issue focused on the visual system.

Clinical Study Confirms Treatment to Reduce Vision Loss

Reported in the September 2009 issue of *Archives of Ophthalmology*, the first proven, effective treatment for patients with central retinal blood vein occlusion has been identified. **Michael Ip** (Ophthalmology & Visual Sciences), national co-chair of the Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE) study conducted at 84 clinical sites, terms the results "extremely compelling" as they demonstrate that treatment with eye injections of corticosteroid medication notably increases patients' chances of visual improvement. Ip also co-chaired a separate trial within the SCORE study, which demonstrated that laser treatment for vision loss from branch retinal vein occlusion is safer than corticosteroid injections and equally effective, with fewer patient complications. These studies provide significant guidance to clinicians, immediately applicable to treating patients with central or branch retinal vein occlusion.

ARRA Funds Augment Study of Steroid Induced Glaucoma

Donna Peters (Pathology & Laboratory Medicine) and her research group have been awarded an *American Recovery and Reinvestment Act* competitive supplement from the National Eye Institute to expand the scope of their original grant, "Control of Trabecular Meshwork Cytoskeleton," studying steroid induced glaucoma. Treatments with steroids can cause glaucoma in approximately 6-8% of the population. This stimulus funding will support Peters' use of new methodology involving phosphoproteomics to study the molecular mechanism in steroid induced glaucoma. The long-term objective of her grant is to identify specific signaling proteins that can be used as therapeutic targets to control this form of glaucoma.

Strong Evidence Links Dietary Fat Intake and AMD Risk

In association with the Women's Health Initiative and supported by the National Eye Institute, **Julie Mares** (Ophthalmology & Visual Sciences) has led the Carotenoids in Age-Related Eye Disease Study (CAREDS) assessing diet, lifestyle, medical and ocular factors that influence macular pigment in middle-aged and older women. Within this population, the CAREDS research group has now evaluated the relationship between the amount and specific type of dietary fat intake and the prevalence of age-related macular degeneration. Data in Mares' current paper support the growing body of evidence that diets high in saturated and polyunsaturated fats may influence the development of intermediate AMD and that diets high in monounsaturated fatty acids may be protective. *Archives of Ophthalmology*, 2009. Nov;127(11):1483-93.

ADA Supports Study of Diabetic Retinopathy

Funding from an American Diabetes Association Research Award will allow **Nader Sheibani** (Ophthalmology and Visual Sciences) to focus on "The role of pigment epithelium derived factor (PEDF) in the development and progression of diabetic retinopathy." Diabetes affects retinal circulation, resulting in vascular abnormalities that may ultimately lead to aggressive growth of new blood vessels

and loss of vision. Discerning how these changes are brought about and identifying their molecular and cellular bases is essential in understanding diabetic retinopathy. Sheibani and his research group will determine the role PEDF, an inhibitor of new blood vessel growth, plays in retinal vascularization and how its alterations in diabetes contribute to the growth of dysfunctional vessels.

Retinal Light Damage

Dana Vaughan (Biology & Microbiology, UW-Oshkosh) studies mechanisms that prevent the ground squirrel from developing permanent vision loss during the long winter months of hibernation, when its retinal cone cells degenerate—and then are reconstructed in the spring. This retinal remodeling process may have relevance in learning about the potential for cell repair in human retinal degenerations. In a current review article in *Progress in Retinal and Eye Research*, Vaughan addresses several hypotheses of retinal light damage, based in part on the close relationship between the photoreceptors and the retinal pigment epithelium. Understanding the molecular mechanisms of light damage in a variety of animal models can provide valuable insights into the effects of light in human disorders and may form the basis of future therapies to prevent or delay visual cell loss. "Retinal light damage: mechanisms and protection." 2009 Dec 4 [Epub ahead of print]

NSF Values Visualization Aids for Basic Life Science

The National Science Foundation has awarded **Michael Gleicher** (Computer Sciences) funds to advance new computer visualization tools to study "Physical and Chemical Alignment of Multiple Protein Surfaces." Building on an existing partnership with biochemists who study protein action, Gleicher will work to develop better matching techniques for finding related molecules and discerning differences between similar ones—tools that will help scientists to infer protein function, design proteins to achieve specific goals, and study evolutionary relationships. This project may also lead to new coursework in visual computing and biochemistry.

A New Animal Model for Study of Age-related Macular Degeneration

Daniel Albert (Ophthalmology and Visual Sciences), **Richard Dubielzig** (Pathobiological Sciences, VetMed), **Christine Sorenson** (Pediatrics), **Nader Sheibani** (Ophthalmology and Visual Sciences) and their research group have discovered that chronic exposure of rats to high intensity cyclic light induced retinal degeneration that progressed to choroidal neovascularization. This is the first model of age-related macular degeneration (AMD), a major cause of blindness, which demonstrates the progressive pathogenesis of the disease. The ability to study the progressive pathogenesis of AMD and choroidal neovascularization will provide detailed knowledge and aid in development of target-specific therapy. Findings are reported in "Development of choroidal neovascularization in rats with advanced intense cyclic light-induced retinal degeneration," *Archives of Ophthalmology*, Vol. 128, Feb 2010, pg. 212-222.

We invite your feedback on this newsletter for the ERI membership.
Please respond to three simple questions: Insights Feedback

About ERI *InSights*

The UW Eye Research Institute will distribute InSights every other month. Its purpose is to build ERI community, advancing member connections and collaborations by sharing research and educational activities as well as member accomplishments and honors (including those of their lab associates and students). We welcome news of research advances, scholarly publications, grant awards, educational and professional honors, available lab positions, or shared equipment/services. If you have an item you wish to submit for possible inclusion, please send it to Gail Stirr at gmstirr@wisc.edu

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