

ERI UPDATES/ANNOUNCEMENTS

ERI Rapid Response Initiative Grants Awarded

The ERI completed its second round of Rapid Response Initiative (RRI) grant awards, providing year-long funding (September '09 through August '10) to four projects that launch new collaborations and strengthen cooperative alliances among scientists from different disciplines and perspectives. RRI grant recipients and project titles are listed below. Project abstracts are available at the ERI website: www.vision.wisc.edu

Neal Barney, MD, Ophthalmology & Visual Sciences

Hydrogel Devices that Promote Cell Survival during Keratoplasty

Collaborators: William Murphy, PhD; Javeed Shaikh Mohammed, PhD (Biomedical Engineering)

Christopher Bradfield, PhD, Oncology

The BigEye Mouse: Genetic Basis

Collaborators: Richard Dubielzig, DVM (Pathobiological Sciences, VetMed); Norman Drinkwater, PhD (Oncology)

Gillian McLellan, BVMS, PhD, Ophthalmology & Visual Sciences; Surgical Sciences, VetMed

3D Analysis of Spectral Domain OCT Images in Feline Models of Optic Neuropathies

Collaborators: Ian Duncan, BVMS, PhD (Medical Sciences, VetMed) Richard Dubielzig, DVM (Pathobiological Sciences, VetMed)

James VerHoeve, PhD; Carol Rasmussen, BA (Ophthalmology & Visual Sciences)

Mona Garvin, PhD; Milan Sonka, PhD; Michael Abramoff, MD, PhD (Iowa Institute for Biomedical Imaging, University of Iowa)

Paula Wolfe, PhD, Curriculum & Instruction

Using Eye Movement to Study Participants' Reading and Motor Performance

Collaborator: Andrea Mason, PhD (Kinesiology)

Retina Research Foundation Endowed Professorships

Bikash Pattnaik (Pediatrics) has been named the UW Eye Research Institute's Retina Research Foundation/Rebecca Meyer Brown Professor for 2009-2012. His primary research interests center on the physiology of vision and ion channels in retinal degeneration. In particular, his work on channel mutations which disrupt potassium transport in the retinal pigment epithelium and Müller glial cells offers insight into the function and regulation of these channels and how this disruption leads to disease. This professorship carries a \$50,000 annual stipend and is awarded to a young scientist to assist in advancing his/her career. **David Gamm** (Ophthalmology & Visual Sciences) currently holds the Retina Research Foundation/Edwin and Dorothy Gamewell Professorship; **Arthur Polans** (Ophthalmology & Visual Sciences) holds the Retina Research Foundation/M. D. Matthews Professorship. Both professorships are awarded by the Eye Research Institute and carry \$50,000 annual stipends.

Poster/Gallery Session Best Student Presentation Award Winners

Outstanding graduate student and postdoctoral trainee poster and artwork presentations were recognized with awards at the October 8th Vision Science & Visual Art Poster/Gallery Session. Awards presented:

"Best Student Contribution, Vision Science & Visual Art" to **Greg Cipriano** (Computer Sciences), Molecular Surface Abstraction; poster authors: Greg Cipriano, George N. Philips, Jr. and Michael Gleicher.

"Honorable Mention" to **Xuefeng Zeng** (Electrical & Computer Engineering), An Endoscope Utilizing Tunable-Focus Microlenses Actuated Through Infrared Light; poster authors: Xuefeng Zeng and Hongrui Jiang. "Honorable Mention" to **Feng Liu** and **Yuzhen Niu** (Computer Sciences), Exploring Perceptual Plausibility for Vision and Graphics Applications; poster authors: Feng Liu, Yuzhen Niu, Michael Gleicher, Hailin Jin, Aseem Agarwala.

Sponsors: We thank **Nikon Instruments, Inc.** for generously sponsoring the ERI Poster/Gallery Session with donation of a Nikon Coolpix L19 8mp digital camera. We thank the **University Book Store** for generously providing UBS gift certificates.

COMING EVENTS

ERI Seminar Noon to 1:00pm, December 8

James Ver Hoeve (Ophthalmology & Visual Sciences) and **Bikash Pattnaik** (Pediatrics) will discuss “The electroretinogram (ERG) toolbox” at Clinical Science Center G5/134. RSVP for pizza lunch by Monday, December 7: gmstirr@wisc.edu

ERI Seminar Noon to 1:00pm, January 12

Ian Duncan (Medical Sciences, VetMed) and **Robert Nickells** (Ophthalmology & Visual Sciences) will talk about their respective research in models of Multiple sclerosis and glaucoma, exploring “Axon loss and axon regeneration.” Come to Room 1360 Genetics/Biotechnology Building on Henry Mall. RSVP for pizza lunch by Monday, January 11: gmstirr@wisc.edu

FACULTY, STAFF & AFFILIATE ACCOMPLISHMENTS

McFall-Ngai Receives Guggenheim Fellowship

Awarded a Guggenheim Fellowship for 2009-10, **Margaret McFall-Ngai** (Medical Microbiology & Immunology) will be studying the role of symbiosis in shaping evolutionary selection, specifically on the form and function of microbial symbioses in the animal immune system. She will visit major centers of microbiology and immunology research, dividing her time between the University of California, San Diego; the Pasteur Institute, Paris; The University of Hawaii; and the National Evolutionary Synthesis Center, a collaborative research center operated by Duke University, the University of North Carolina at Chapel Hill, and North Carolina State University.

Hamel Faculty Fellowship Awarded to Casid

Jill Casid (Art History), Director of the Visual Culture Center, has received a noteworthy Hamel Faculty Fellowship in the College of Letters and Sciences. This five-year award—for mid-career scholars who received tenure within the last ten years—recognizes outstanding contributions in the areas of research, undergraduate mentoring and teaching, and outreach. A historian, a theorist of visual culture, and a practicing artist in photo-based media, Casid will use fellowship support to work on three new book projects. *The Volatile Image: Other Histories of Photography* explores non-Western traditions of early photography in Latin America and India. She is also editing two anthologies: *Transcultural Genealogies: Post-colonial Theory* and *The Story of Modern Art and Visual Transculture*.

Duncan Elected Fellow of Wisconsin Academy

Ian Duncan (Medical Sciences, VetMed) has been elected a 2009 Fellow of the Wisconsin Academy of Sciences, Arts & Letters. Duncan—one of seven distinguished Wisconsin artists, writers and scientists named Fellows this year—is exploring the application of stem cell research to the treatment of neurological diseases. He currently holds Eye Research Institute Rapid Response Initiative grant funding for a project evaluating vision in a marmoset model of multiple sclerosis, exploring the effects of inflammation and degeneration in the retinal nerve fiber layer of the optic nerve. His work holds promise for the possible cure of several diseases, including multiple sclerosis, stroke and Alzheimer’s.

RESEARCH NEWS

NSF Awards Funds for Study Linking Motor Control & Visual Information

Andrea Mason (Kinesiology) has recently received National Science Foundation grant funding to focus on “The Role of Sensory Information for Performance in Virtual Environments Across the Lifespan.” This three-year grant will support her study of movement control in virtual environments in a population ranging in age from 6 to 80 years, with the goal of understanding how visual information is used in motor control and how presentation of visual information can be improved in virtual environments. Notable uses are by the young for skill development, by the healthy elderly for skill maintenance, and by the injured for rehabilitation.

Dual Capability of Squid Light Organ Noted

Collaborative research teamwork by **Margaret McFall-Ngai** (Medical Microbiology & Immunology) and **Nansi Jo Colley** (Ophthalmology & Visual Sciences) led to their demonstration that the light-emitting organ of the squid *Euprymna scolopes* is able to detect light as well as to produce and control the intensity of luminescence. Their work, entitled “Evidence for light perception in a bioluminescent organ,” demonstrates similarities between eyes and light organs and raises speculation that the light organ may have evolved by assembling existing visual system components in a novel combination or context, a process known as evolutionary “tinkering.” *Proceedings of the National Academy of Sciences* 2009; 106(24):9836-41.

Team Developing Bio-inspired Imaging Systems Gains NSF Support

An interdisciplinary team led by principal investigator **Hongrui Jiang** (Electrical & Computer Engineering) has been awarded four years of funding support (\$2 million) for a National Science Foundation Emerging Frontiers in Research & Innovation grant to develop “Biology Inspired Intelligent Micro-Optical Imaging Systems.” With Jiang, fellow ERI members **Christopher Murphy** (Surgical & Radiological Sciences, VetMed, UC-Davis), **Li Zhang** (Computer Sciences), and **James Ver Hoeve** (Ophthalmology

& Visual Sciences) serve as co-PIs to design micro-scale imaging systems. The team will integrate elements of distinctive features of eyes found in nature into superior system designs for imaging technology with applications ranging from medical diagnostics, biophotonics, and robotics to electronics, polymer sciences and computer vision. Their study will enhance understanding in comparative vision, ophthalmology, visual neuroscience and neurophysiology, as well as engineering disciplines.

Skin Cells Can Become Retinal Cells

David Gamm (Ophthalmology & Visual Sciences) and his research group have discovered that retinal cells can be produced from human skin cells ‘reprogrammed’ into induced pluripotent (iPS) stem cells, which have the same potential as embryonic stem cells to develop into virtually every human cell type. This key work not only advances detailed study of human retinal development, but ultimately paves the way for damaged retinas to be repaired by cells grown from a patient’s own skin. More immediately, such cultivated cells could be used to study genetically linked eye disorders or to screen new drugs for retinal conditions. The discovery is reported in “Modeling early retinal development with human embryonic and induced pluripotent stem cells,” *Proceedings of the National Academy of Sciences*, 2009; 106(39):16698-703.

NSF Grants Funding to Advance Visualization Tools

Michael Gleicher (Computer Sciences) has been granted a National Science Foundation EAGER (EARly Concept Grant for Exploratory Research) award supporting his “Comparative Visualization” project. He and his research team aim to build tools that help scientists make comparisons between complicated data by creating images specifically designed to aid comprehension of otherwise hard to grasp content. The project seeks to understand how visualization can be used in diverse domains ranging from Biochemistry (comparing molecular shapes), to Educational Psychology (comparing evaluation metrics), to Neuroscience (comparing brain scans). By studying a range of visual applications, Gleicher hopes to find general principles that can be applied in developing tools to address a wide array of scientific problems—by shaping what we can’t easily see.

We invite your feedback on this developing news/communication tool for the ERI membership.

Please respond to three simple questions: [InSights Feedback](#)

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About ERI InSights

The UW Eye Research Institute will distribute InSights bimonthly. 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. The deadline for the next issue is Friday, January 7.