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

ERI ANNOUNCEMENTS & COMING EVENTS

Recipients of ERI RRF Professorships Named

Arnold Ruoho (Pharmacology) has been named the Eye Research Institute's Retina Research Foundation/Edwin and Dorothy Gamewell Professor for 2010-2013. Ruoho's retina-related research is directed at understanding the molecular mechanisms underlying neurotransmitter release and receptor activation. He has discovered a new class of compounds that are high affinity inhibitors of the sigma 1 receptor, a transmembrane chaperone protein expressed in many different tissue types. Sigma 1 is particularly concentrated in certain regions of the central nervous system and in multiple layers of the retina. The Retina Research Foundation has generously established a new named Chair within the ERI, created to support basic science research regarding the diagnosis, treatment and cure of all types of macular degeneration. The Kathryn and Latimer Murfee Chair has been awarded to **David Gamm** (Ophthalmology & Visual Sciences), whose work producing multiple retinal cell types from induced pluripotent stem (iPS) cells has led to development of human retinal disease-specific models advancing stem cell-based therapies. These professorships, awarded by the Eye Research Institute, carry $50,000 annual stipends.

ERI Seminar Noon to 1:00pm, September 14

Brad Postle (Psychology & Psychiatry) and **Leigh Ann Mrotek** (Kinesiology, UW-Oshkosh) will speak from their distinct perspectives about "Visual roles in memory and motor control."
Bock Labs Penthouse, 9th floor
RSVP for pizza lunch by 3:00pm Monday, September 13: gmstirr@wisc.edu
*Full 2010-11 ERI Seminar Schedule: http://www.vision.wisc.edu/seminars.html

2nd Annual Vision Science & Visual Art Poster and Gallery Session, Tuesday, September 28

Plan to participate in and attend this event, showcasing vision science research and visual artwork across the multidisciplinary community of ERI faculty and students working to gain critical knowledge about the science and art of vision.
Online registration will open August 16th at the ERI website.

Who: Eye Research Institute and Center for Visual Culture members and associated scientists, researchers, postdocs, graduate students and advanced undergraduates

What: - vision science posters new or previously presented at a recent conference (no abstracts required)
- visual art work new or previously exhibited (any media, any format)

When: Tuesday, September 28, 2010

3:30pm to 4:00pm	poster and art display setup
4:00pm to 5:30pm	presenters at posters & art displays (judges circulating)
	Reception & Refreshments
5:30pm to 6:45pm	ERI Membership Meeting
	featured speaker, Dr. Michael Marmor, Stanford University
	The Artist's Eyes: Vision and the History of Art
	Profile | **Book**

Where: Health Sciences Learning Center Atrium, 750 Highland Avenue
Lecture in HSLC Room 1335

Awards: for "Best Student Presentations"

ERI Sponsors Community Class: *Feast for the Eyes*

The First Unitarian Society (FUS) of Madison will offer an October course presented by ERI members, "Feast for the Eyes." Participants will learn about eye health and disease states, diet patterns associated with better eye health, seasonal eating and meal planning, and lifestyle choices augmenting health (activity, yoga, mindfulness). Instructors include **Julie Mares, Nansi Colley, Todd Perkins** (Ophthalmology & Visual Sciences), and **Tracy Perkins** (ERI Admin). The class is scheduled on the first three Tuesday evenings in October from 6:30pm to 8:30pm. (Cost is $25 for FUS members, $35 for non-members.) To register, go to the FUS website: http://www.fusmadison.org/adult/adult-education.shtml

FACULTY, STAFF & AFFILIATE ACCOMPLISHMENTS

Professor Honored for Teaching, Research and Service

The Association for Education in Journalism and Mass Communication (AEJMC) selected **Dietram Scheufele** (Life Sciences Communication) as winner of the 2010 Krieghbaum Under-40 Award. This award, named for late New York University professor Hillier Krieghbaum, honors a young AEJMC member who has shown outstanding achievement and effort in the areas of teaching, research and public service. Scheufele, whose research focuses on the intersection of media, politics and science, is currently working on a series of experimental studies exploring how visual representations of nanotechnology in mass media shape subsequent information processing, learning, and attitude formation. In keeping with the Wisconsin Idea, he focuses on building bridges between society and science discovery in university contexts.

Appointment to Editorial Advisory Board

Marshall Flax, who serves as Director of Vision Rehabilitation for the Wisconsin Council of the Blind and Visually Impaired, has been appointed to a five-year term on the editorial advisory board for the *Journal of Visual Impairment & Blindness*. This is the international, interdisciplinary journal of record on blindness and visual impairment, publishing scholarship and information and serving as a forum for the exchange of ideas and discussion of issues in the field.

RESEARCH NEWS

UW-Madison, UW-Milwaukee Intercampus Research Incentive Grant Awarded

Nader Sheibani (Ophthalmology & Visual Sciences) and **Amir Assadi** (Mathematics) are among the first eight faculty teams to receive an Intercampus Research Incentive grant under a new UW-Milwaukee and UW-Madison initiative designed to foster inter-institutional collaboration. Because the earliest signs of diabetic retinopathy (DR) can go undetected by routine fundus examinations, their research team proposes to employ a new combination of novel data analysis and imaging tools to accelerate DR diagnosis. They will focus on "Improving detection and infrastructure to better treat diabetic retinopathy." Together the Madison investigators have all the elements for *in vitro* and *in silico* (computer-based simulation) experimentation, data acquisition, analysis, and modeling, which will be augmented by Milwaukee partner Hao Zhang's functional retinal imaging technology—termed "photoacoustic ophthalmoscopy." While pooling resources and expertise to develop a predictive model of early diabetic retinopathy, their work will advance non-invasive diagnostics for assessment of eye vascular dysfunction. Assadi, a new ERI member, works in computational integrative systems biology, modeling patterns of dynamics in development, growth and behavior.

ERI Member Featured in Public Radio Interview

Aimee Arnoldussen (Wicab, Inc.), neuroscientist at the Madison biomedical engineering company developing the BrainPort vision device, spoke with Milwaukee Public Radio (WUWM) *Lake Effect* program host Mitch Teich about "Using the Tongue to See." Explaining how the brain's adaptability allows interpretation of electronic stimuli on the tongue to be perceived as visual information, Arnoldussen helped Teich to field-test the device and directly report his experience to listeners. The program aired on July 2, 2010 and can be heard via streaming media at: http://www.wuwm.com/programs/lake_effect/view_le.php?articleid=1011

Genomic Research Method Advances Diagnosis of Eye Anomalies

The molecular cause of ocular birth defects is often unknown. **Gordana Raca** (Pathology & Laboratory Medicine) has been determining the feasibility of using new methods in genomic research to study genetic diseases with complex inheritance patterns, including eye defects causing childhood visual impairment and blindness. Raca and colleagues tested whether use of advanced gene sequencing technologies, so-called "next generation" sequencing (NGS), is an effective strategy to efficiently sequence hundreds of candidate genes from large numbers of individuals affected by anophthalmia (absent eye), microphthalmia (small eye), and coloboma (a hole in an eye structure). Success with this method is reported in "Next generation sequencing in research and diagnostics of ocular birth defects," in the June issue of *Molecular Genetics and Metabolism.* Raca affirms that NGS will speed the discovery of new genes for eye malformations, dramatically improving our ability to determine the molecular source of eye defects. More comprehensive and effective molecular diagnostics will result in better clinical management, recurrence risk assessment, and preventive and therapeutic approaches for many genetically inherited diseases.

Visual Feedback Is a Key to Understanding Motor Control

Kinesiologist **Andrea Mason's** work on two-handed coordination considers how vision informs action. Mason shared this explanation: "Consider an outfielder running to catch a ground ball when it takes a funny bounce on some uneven dirt and subsequently travels in a completely different direction than its original path. This is an example of a perturbation. In the lab, we use perturbations to understand how people use visual information to program and perform motor tasks such as reaching out to grasp an object. Perturbation studies allow us to better understand how long it takes our motor control system to sense that a change has occurred in the environment, process that information, and generate a correction to our original plan in order to successfully achieve our goal. Responding to perturbations becomes even more challenging when we use both hands to complete motor tasks

because our visual attention must be divided between two hands and the two objects that we wish to grasp." Because of growing interest in bimanual training for motor rehabilitation of disorders such as cerebral palsy and stroke, it is imperative to understand how bimanual skills are planned, performed and corrected in the normal population. Study results are reported in "Perturbation of object location during bimanual prehension: the role of visual feedback," *Human Movement Science,* August 2010.

Electronic Tongue Stimulation As Rehabilitation Tool

The notion of the brain's plasticity and its ability to repair itself was pioneered by the late Paul Bach-y-Rita, long a neuroscientist at UW-Madison. **Yuri Danilov** (Rehabilitation Medicine) and colleagues Mitchell Tyler and Kurt Kaczmarek, all in UW-Madison's Tactile Communication & Neurorehabilitation Lab, are piloting a study of the effects of electronic tongue stimulation in recovering brain functions damaged by multiple sclerosis (MS), which causes nerves to fail to properly conduct the impulses that tell muscles and organs what to do. When major nerves in the tongue—connected to the brain stem—transmit stimulation to this area controlling basic autonomic functions like heart rate and breathing, the stimulation branches out and in turn stimulates many parts of the brain. This neuromodulation, in conjunction with exercise of the impaired function (e.g., balance, speech, attention), helps the brain to accomplish repair and regain function. Reported for a lay audience in the July 15 issue of *AmericanWay* in-flight magazine, study results will be presented at the Society for Neuroscience conference in November 2010.
http://www.americanwaymag.com

NEW PUBLICATIONS/CURRENT LITERATURE

These are among recent publications by ERI members, including Epubs and print publications from late May to early August 2010. The list is organized alphabetically by first-listed ERI author name, highlighted in bold. As we do not have full access to all publication resources for each discipline, we may have missed one of your publications. If so, please accept our apologies and send us your citations for inclusion in the next issue.

Albert DM, Atzen SL, Morgan P.The practice of ophthalmology in rural Wisconsin in the mid-19th century: from the casebooks of Francis Paddock, MD. Arch Ophthalmol. 2010 Jun; 128(6):783-8.

Liesegang TJ, Schachat AP, **Albert DM**. Defining authorship for group studies. Am J Ophthalmol. 2010 Aug;150(2):135-7.

Miller ND, Durham Brooks TL, **Assadi AH**, Spalding EP. Detection of a gravitropism phenotype in glutamate receptor-like 3.3 mutants of Arabidopsis thaliana using machine vision and computation. Genetics. 2010 Jul 20. [Epub ahead of print]

Bentley E, Murphy CJ, Li F, Carlsson DJ, Griffith M. Biosynthetic corneal substitute implantation in dogs. Cornea. 2010 Aug;29(8):910-6. Epub 2010 Jun 9.

Myrna KE, **Bentley E,** Smith LJ. Effectiveness of injection of local anesthetic into the retrobulbar space for postoperative analgesia following eye enucleation in dogs. J Am Vet Med Assoc. 2010 Jul 15; 237(2):174-7.

Klein R, **Blodi BA,** Meuer SM, Myers CE, Chew EY, Klein BE. The prevalence of macular telangiectasia type 2 in the Beaver Dam eye study. Am J Ophthalmol. 2010 Jul;150(1):55-62.e2.

Bultmann H, Girdaukas G, Kwon GS, **Brandt CR.** The virucidal EB peptide protects host cells from HSV-1 infection in the presence of serum albumin and aggregrates proteins in a detergent-like manner. Antimicrob Agents Chemother. 2010 Jul 19. [Epub ahead of print]

Chung MK, Worsley KJ, Nacewicz BM, Dalton KM, Davidson RJ. General multivariate linear modeling of surface shapes using SurfStat. Neuroimage. 2010 Jul 8 [Epub ahead of print]

Hanson JL, **Chung MK,** Avants BB, Shirtcliff EA, Gee JC, Davidson RJ, Pollak SD. Early stress is associated with alterations in the orbitofrontal cortex: a tensor-based morphometry investigation of brain structure and behavioral risk. J Neurosci. 2010 Jun 2;30(22):7466-7472.

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ACCORD Study Group; ACCORD Eye Study Group, Chew EY, Ambrosius WT, Davis MD, **Danis RP**, Gangaputra S, Greven CM, **Hubbard L**, Esser BA, Lovato JF, Perdue LH, Goff DC Jr, Cushman WC, Ginsberg HN, Elam MB, Genuth S, Gerstein HC, Schubart U, Fine LJ. Effects of medical therapies on retinopathy in type 2 diabetes. N Engl J Med. 2010 Jul 15;363(3):233-44. Epub 2010 Jun 29.

Bell CM, Schwarz T, **Dubielzig RR.** Diagnostic features of feline restrictive orbital myofibroblastic sarcoma. Vet Pathol. 2010 Jun 1. [Epub ahead of print]

Johnson RA, Baker-Herman TL, **Duncan ID,** Mitchell GS. Ventilatory impairment in the dysmyelinated Long Evans shaker rat. Neuroscience. 2010 Sep 1;169(3):1105-1114. Epub 2010 Jun 11.

Lin HP, Vincenz C, **Eliceiri KW,** Kerppola TK, Ogle BM. Bimolecular fluorescence complementation analysis of eukaryotic fusion products. Biol. Cell. 2010 Jul 1. [Epub ahead of print]

Provenzano PP, **Elicieri KW**, Inman DR, Keely PJ. Engineering three-dimensional collagen matrices to provide contact guidance during 3D cell migration. Curr Protoc Cell Biol. 2010 Jun;Chapter 10:Unit 10.17.

Li HK, **Hubbard LD,** Danis RP, Esquivel A, Florez-Arango JF, Krupinski EA. Monoscopic versus stereoscopic retinal photography for grading diabetic retinopathy severity. Invest Ophthalmol Vis Sci. 2010 Jun;51(6):3184-92. Epub 2010 Jan 6.

Li HK, **Hubbard LD,** Danis RP, Florez-Arango JF, Esquivel A, Krupinski EA. Comparison of multiple stereoscopic and monoscopic digital image formats to film for diabetic macular edema evaluation. Invest Ophthalmol Vis Sci. 2010 Jun 23. [Epub ahead of print]

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Chu UB, Song J, Mavlyutov TA, **Guo LW.** In vitro interaction of tubulin with the photoreceptor cGMP phosphodiesterase gamma-subunit. Neurosci Lett. 2010 Jul 21. [Epub ahead of print]

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Verdoni AM, Schuster KJ, Cole BS, **Ikeda A**, Kao WW, **Ikeda S**. Deletion of serum response factor rescues the cornea defects caused by the loss of actin depolymerizing factor (ADF/Destrin) in mouse. Genetics. 2010 Jul 6. [Epub ahead of print]

Heintz E, Wiréhn AB, Peebo BB, Rosenqvist U, **Levin LA**. Prevalence and healthcare costs of diabetic retinopathy: a population-based register study in Sweden. Diabetologia. 2010 Jul 2. [Epub ahead of print]

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Tang H, **Murphy CJ,** Zhang B, Shen Y, Van Kirk EA, Murdoch WJ, Radosz M. Curcumin polymers as anticancer conjugates. Biomaterials. 2010 Sep;31(27):7139-49. Epub 2010 Jun 29.

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Acheson DJ, Hamidi M, Binder JR, **Postle BR**. A common neural substrate for language production and verbal working memory. J Cogn Neurosci. 2010 Jul 9. [Epub ahead of print]

Hamidi M, Johnson JS, Feredoes E, **Postle BR**. Does high-frequency repetitive transcranial magnetic stimulation produce residual and/or cumulative effects within an experimental session? Brain Topogr. 2010 Jul 10. [Epub ahead of print]

Kim S-H, Han M, **Scheufele DA.** Think about him this way: priming, news media, and South Koreans' evaluation of the president. Int J Public Opin Res. 2010 Jul 6:edp057v1-edp057.

Grutzmacher C, Park S, Elmergreen TL, Tang Y, Scheef EA, **Sheibani N, Sorenson CM.** Opposing effects of bim and bcl-2 on lung endothelial cell migration. Am J Physiol Lung Cell Mol Physiol. 2010 Jul 23. [Epub ahead of print]

We invite your feedback on this newsletter for the ERI membership.
Please respond with comments at: 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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