

Molecular & Integrative Physiology

Newsletter December 2009



Greetings from the Head

by Byron Kemper

It has been an interesting year for MIP, and the beginning of a critical period for us. In about a five-year period, roughly half of our twenty core faculty will likely be lost, primarily to retirement, which represents a great loss to the department in experience and talent, but at the same time presents a great opportunity to shape the department to meet the demands of modern physiological research in the coming decades. This past academic year, Joan Dawson and Eric Jakobsson retired, and Richard Kollmar moved to a new position (more in MIP Family News, page 6). Shaping the department is a great challenge under the present financial conditions with new faculty hires at a premium. We were, therefore, extremely fortunate and excited to recruit two new outstanding faculty members from the University of California at San Francisco—Hee Jung Chung, a neuroscientist, and Eric Bolton, a reproductive biologist. They will be joining us in January. Stay tuned to hear about their research in next year's newsletter.

A second major event this year was the American Reinvestment and Recovery Act (ARRA), which provided a very substantial amount of new funds for biomedical research. Requests for applications under this

Act had short deadlines so there was a lot of scrambling and stress to get applications submitted. As I write, MIP faculty members have been awarded more than \$1 million in ARRA grants with more to come. At our recent annual Recognition Reception, eight faculty members were recognized for a total of ten new grant awards during the year from several agencies, including the National Institutes of Health, the National Science Foundation, the American Diabetes Association, and the Illinois Department of Public Health. At the same reception, fourteen faculty members and graduate students were recognized for being ranked as excellent teachers by their students. In accord with its tradition, MIP continues to excel in both teaching and research.

In the newsletter this year, four faculty members describe their research, including our newest tenure track member, J. Kim Kemper; our most recently promoted member, Claudio Grosman; and two senior faculty, Ann Nardulli and Rhanor Gillette. This is reduced from five last year to make room for the MIP Family News section, which covers milestones and news from alumni, faculty, students, and friends of MIP. You may also notice that our "Funds for a Brilliant Future" form is smaller now, not because the need is less, but to make more room for news. Please send news and pictures to mip-news@illinois.edu, and, of course, keep us in mind as you plan your annual charitable giving so that together we can build a brilliant future for physiology at Illinois. □

In This Issue

Greetings from the Head by Byron Kemper	1
Importance of Estrogen in Human Health and Disease by Ann Nardulli	2
Molecular Physiology of Neurotransmitter-gated Ion Channels by Claudio Grosman	3
Nuclear Receptor Actions in Metabolic Regulation: Molecular Understanding to Therapeutic Application by Jongsook Kim Kemper	4
How do animals make decisions? by Rhanor Gillette	5
MIP Family News	5

About the Newsletter

The newsletter is an annual publication of the Department of Molecular and Integrative Physiology in the School of Molecular and Cellular Biology at the University of Illinois, Urbana-Champaign. The newsletter is designed and edited by William Gillespie, MCB Communications Coordinator.

Our alumni are important to us. We want to hear from you. Send us your latest news, and we'll include it in the next newsletter's MIP Family News.

We also welcome suggestions for future newsletters.

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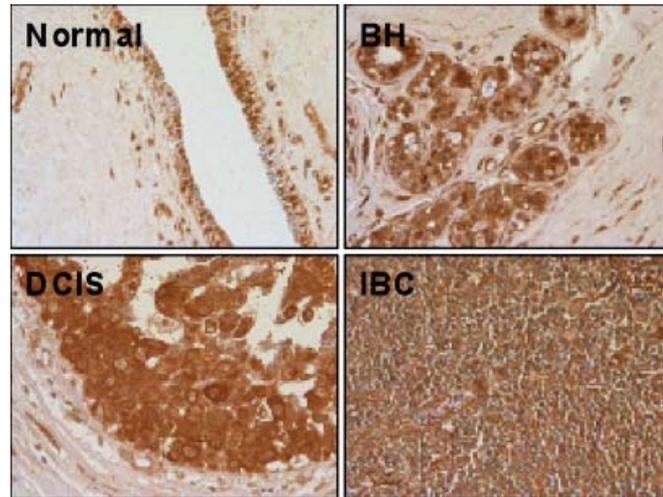
Importance of Estrogen in Human Health and Disease

by Ann Nardulli

The role of estrogen in women's health has been and continues to be a subject of great personal and professional interest to me. Estrogen plays a critical role in regulating fertility and maintaining bone mineral density in premenopausal women. Its importance is also apparent in postmenopausal women, who experience an increase in osteoporosis and cardiovascular disease as their circulating estrogen levels decline. In addition to promoting health, estrogen has been linked to disease. Its role in breast cancer initiation, growth, and progression provides additional impetus to study the actions of this hormone.

Target tissues respond to estrogen because cells express a specialized protein, the estrogen receptor (ER), which binds to estrogen and then interacts with DNA to initiate changes in gene expression. To try to understand how the ER regulates estrogen-responsive gene expression, we developed a novel method to isolate and identify proteins that associate with the DNA-bound ER and influence its activity. From these studies we discovered that a number of the proteins associated with the DNA-bound ER help to maintain the integrity of cellular proteins and DNA.

Jennifer Schultz-Norton, Abhi Rao, and Carol Curtis showed that these proteins interact with the ER and alter the



Expression of an ER-associated protein in normal breast tissue, benign hyperplasia (BH), ductal carcinoma in situ (DCIS), and invasive breast cancer (IBC). The protein is stained brown in these sections.

estrogen responsiveness of cultured human breast cancer cells. Because the ER-associated proteins are involved in maintaining protein and DNA structure/function, it seemed possible that over- or under-expression of any one of these proteins might be involved in the initiation or progression of breast cancer. Thus, Carol Curtis examined the expression of these proteins in normal breast tissue and in breast cancer biopsies (Fig). We were interested to learn that the ER-associated proteins were more highly expressed in mammary tumors than in normal mammary cells, but that their concentration in the nucleus, where they interact with ER and alter gene expression, was significantly diminished. These findings provide one explanation

for the alterations in estrogen-responsive gene expression that are observed in human breast cancer cells.

Stroke is the third most common cause of death in the U.S. and disproportionately affects women. Interestingly, a number of studies have shown that estrogen helps to protect the brain from stroke. Recently, we have begun to examine the effects of estrogen in the brain and to determine whether the ER-associated proteins we identified might help to protect the brain from stroke-induced injury. Our goal is to define hormonal treatments that diminish stroke-induced brain injury. □



Members of the Nardulli lab: (from left to right) Bonnie Ziegler, Abhi Rao, Ann Nardulli, and Alicia Dietrich

Ann Nardulli is one of our own, having received her Ph.D. in physiology for studies with Benita Katzenellenbogen in 1987. Prior to that she taught grade school for several years, and, after receiving her Ph.D., was a postdoctoral fellow with David Shapiro in biochemistry here. She joined our department as an assistant professor in 1992, ascending to her present position as professor. In addition to her research, Dr. Nardulli excels at teaching and received the Department Heath Award for Excellence in Teaching Physiology in 2002. Her research interests as described above are to understand estrogen action with an emphasis on its role in breast cancer and in protecting the brain from stroke-induced injury.

The Grosman Lab



Chris Staehlin
(Undergraduate student)



Gina Papke
(Undergraduate student)



David Papke
(MD/PhD student)



Sergio Elenes
(Visiting Scholar)



Gisela D. Cymes
(Postdoctoral Associate)



Giovanni Gonzalez
(Postdoctoral Associate)



Claudio Grosman
(Lab. PI)

Molecular Physiology of Neuro-transmitter-gated Ion Channels

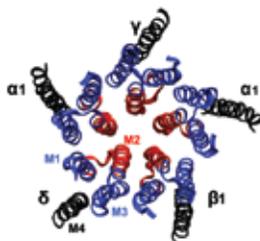
by Claudio Grosman

I arrived at Illinois as an assistant professor in the summer of 2002, to a large extent attracted by the magic interpersonal skills of the then-Head, Phil Best, and by the prospect of intellectually interacting with Dr. Sandy Helman, a now-retired vibrant biophysicist interested in the transport of ions across epithelia. My group works on ion channels, the ion gatekeepers of the cell, with special emphasis on the quantitative aspects of the channels that mediate fast synaptic transmission. Hence, we often say in the lab that we are walking with one foot in biophysics and the other in neurosciences.

I have been working on the electrophysiological aspects of ion channels since my graduate-student years. I sometimes feel that I joined this field as a reaction against my undergraduate biochemistry experience. I was tired of chromatography columns, electrophoresis gels, graph bars, and blots of all kinds, and wanted to learn about cables, oscilloscopes, currents, voltages, complex curve fitting, and single molecules. The learning curve has been steep, but it has been a most satisfying journey.

The main focus of my group's research has been the muscle nicotinic acetylcholine receptor (AChR) which is a close relative of the nicotinic receptors (Fig) in the brain and other tissues. In the

brain, these receptors mediate nicotine addiction and their dysfunction underlies schizophrenia and Alzheimer's disease, whereas, in other tissues, they are involved in signaling pathways leading to cancer. The AChR is also a model for other neurotransmitter-gated ion channels that are critical for normal neural function.



Structural model of the transmembrane portion of the muscle-type nicotinic receptor

We primarily work at the single molecule level, using the patch-clamp technique, a method that has converted ion channels from dubious entities into the best characterized membrane proteins. The muscle AChR was the first ion channel to be purified and cloned, and thus, is the ion channel many biophysicists have cut their teeth on, but the mechanism and regulation of the movement of an ion through a single channel and the associated conformational changes have resisted analysis. My former graduate student Dr. Yamini Purohit and I were able to measure for the first time the affinity of ligands that bind but do not efficiently open the channel with a novel single-channel assay (*J. Gen. Physiol.*, 2006a) and to analyze the effect of

pore blockers on the kinetics of conformational changes of the AChR which led us to propose different mechanisms for two inactive states of the channel (*J. Gen. Physiol.*, 2006b). My postdoc, Dr. Sergio Elenes (now an assistant professor at the Univ. of Colima, Mexico) and I applied neurotransmitter as a train of pulses to better mimic acetylcholine action in the muscle, and analyzed mutant receptors, including natural mutants that cause myasthenic syndromes in children. We found that opening of AChR decreases with the repetitive pulses in a frequency-dependent manner which may partially explain skeletal muscle weakness and fatigue in these patients (*J. Gen. Physiol.*, 2006c and 2009). With Dr. Gisela Cymes, I have begun to bridge the gap between X-ray crystal structures and function by probing structure on well defined functional states (*Nature*, 2005, and *Nature Struct. Mol. Biol.*, 2008).

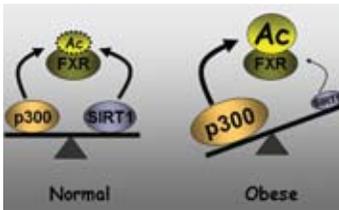
Our current studies are continuing in several interesting directions: the effect of repetitive application of neurotransmitters on ion channels in general with David Papke, the role of Ca^{+2} in AChR signaling that may lead to cancer with Dr. Cymes, and examining competing models of the closed conformation of the AChR with Dr. Giovanni Gonzalez-Gutierrez. I was honored to be promoted to associate professor with tenure recently and look forward to many more years of careful research into the behavior of these fascinating ion pores. □

Claudio Grosman obtained a bachelor and masters degree in biochemistry from the University of Buenos Aires, and a Ph.D. in biophysics from the same institution in Argentina. After five years of postdoctoral work with Tony Auerbach at the University at Buffalo, he joined the Department of MIP, the Center for Biophysics and Computational Biology, and the Neuroscience Program here in 2002. His research interests are in the area of structure-function relationships in ion channels. He is highly sought as a research speaker by other institutions and conferences and recently received renewed funding for his research from the National Institutes of Health.

Nuclear Receptor Actions in Metabolic Regulation: Molecular Understanding to Therapeutic Application

by Jongsook Kim Kemper

Excess amounts of cholesterol, bile acids, glucose, and fat in the body are closely associated with metabolic disorders, such as fatty liver disease, obesity, and type II diabetes, which have reached epidemic status in industrialized countries. I am interested in understanding how transcriptional regulatory networks of nuclear receptors and their cofactors control metabolic homeostasis and how disturbance of these regulatory networks cause metabolic disorder. We are focusing on two liver nuclear receptors, Small Heterodimer Partner (SHP), and the bile acid receptor, Farnosoid X receptor (FXR).



In the healthy individual, acetylation and activity of FXR is dynamically balanced by p300 and SIRT1 activities, but in obesity and disease states, like diabetes, FXR is hyperacetylated.

SHP regulates cholesterol and bile acid levels in the body by inhibiting cholesterol 7 α hydroxylase (CYP7A1), which is rate limiting for the conversion of cholesterol to bile acids. Using molecular, cellular, and animal studies, my former graduate students, Sungsoon Fang and Ji Miao (present post-doc), were able to show that SHP works by coordinately and sequentially recruiting chromatin modifying cofactors (histone deacetylases, methyl transferases, and remodeling complexes) to the CYP7A1 promoter to repress the gene (*Mol. Cell. Biol.*, 2004, 2007, 2009). Present graduate students, Deepthi Kanamaluru and Linda Yang, are continuing studies of chromatin modifications which will ultimately provide a detailed understanding of the molecular mechanism and provide potential thera-

peutic targets for treating high cholesterol.

For more than a decade it has generally been thought that FXR acts only to increase the synthesis of SHP. Ji Miao, however, recently made an important discovery that SHP is a rapidly turning-over protein and that bile acids or the intestinal FGF19 dramatically increase the stability of SHP in the liver. Stabilization contributes at least equally with biosynthesis in increasing hepatic SHP levels (*Genes and Dev.*, 2009), thus altering the well-established paradigm.

The function of FXR in metabolic regulation has been well known, but how the activity of FXR itself is regulated was not well understood. In recent exciting studies, my graduate students, postdoc, and I have shown that FXR acetylation and its activity are dynamically regulated in a reciprocal manner by p300 acetylase and SIRT1 deacetylase under normal conditions (Fig) but acetylation is constitutively elevated in metabolic disease states so that, intriguingly, the balance between p300 and SIRT1 activities is critical for maintaining normal FXR signaling (*Cell Metabolism*, 2009). Other current exciting studies by my graduate students, Jiyoung Lee and Caitlyn Ejankowski, are based on our recent finding that FXR regulates the expression of microRNAs which are relatively recently discovered RNAs that may regulate up to 30% of all human genes and may underlie some diseases. One of these FXR-responsive microRNAs,

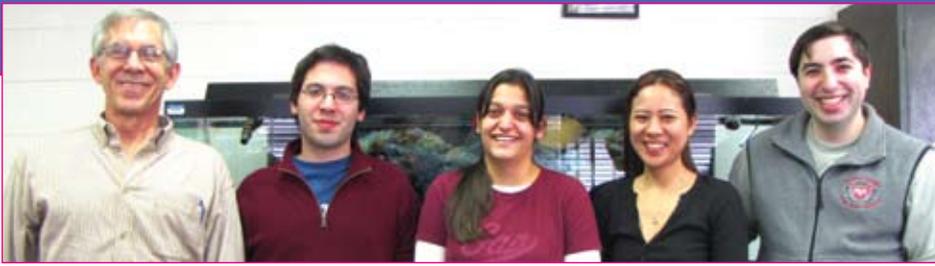
miR-34a, interestingly, down-regulates SIRT1 (*PNAS*, in revision). These studies may provide great insight into how FXR selectively regulates its many target genes and again may provide potential therapeutic targets.

It is my great pleasure to have a chance to work with hard working and bright young scientists and watch their development into excellent researchers. Their passion for science serves as a source of energy and inspiration for me. □

Jongsook Kim Kemper received her B.S. degree at Seoul National University in Korea and conducted her graduate studies in the Byron Kemper lab in MIP. After post-doctoral studies with David Shapiro in the Department of Biochemistry at the University of Illinois and with James Whitlock at Stanford University, she joined MIP initially as a research assistant professor and was appointed as associate professor in 2008. Her research interests focus on nuclear receptor actions in health and metabolic disorders. Her research has been published recently in top-rank journals such as Cell Metab. and Genes Dev. and is funded by grants from the National Institutes of Health, the American Heart Association, and the American Diabetes Association.



Members of the Kemper Lab: (from left to right) Bhaskar Ponugoti, Jiyoung Lee, Deepthi Kanamaluru, Jongsook Kim Kemper, Ji Miao, and Linda Yang. Not shown: Caitlyn Ejankowski.



Members of the Gillette Lab: (left to right) Rhanor Gillette, Derek Caetano-Anolles, Vanessa Noboa, Keiko Hirayama, and Jeff Brown. Not pictured: Avery Ketcher, Fallon Moliere, Alex Zajac.

How do animals make decisions?

by Rhanor Gillette

*Tell me where is Fancy bred,
or in the heart or in the head?
It is engendr'd in the eye,
and by gazing, fed.*—William Shakespeare

How do animals make decisions? That's the driving question for my laboratory. We work on a simple animal, the predatory sea-slug *Pleurobranchaea californica* (Fig), whose nervous system is also so simple that we have been able to describe the neuronal circuitry underlying a variety of important decisions in the animal's foraging behavior. These include the suppression of feeding during escape, by odor-avoidance learning, and by satiation. Such decisions have a cost-benefit foundation related directly to enhancement of the animal's reproductive fitness, and ally them to the economic, approach-avoidance decisions we make in everyday life.

Our work indicates that *Pleurobranchaea* makes decisions much like we do, by integrating sensation, internal state, and the memory of experience. Also like us, they don't use sensory information about stimulus qualities *per se* in the computation of a decision, but rather they may use how information makes them feel. In the lab presently, Vanessa Noboa (MIP), Keiko Hirayama (neuroscience) and Jeff Brown (biophysics) are expertly building on the known neuronal circuitry with delicate electrophysiological techniques to elaborate: 1) how the animal comes to learn that a certain odor may be associated with a dangerous prey item, 2) how appetite (manifested in the state of the feeding network) influences the sym-



Predatory sea-slug *Pleurobranchaea californica* and a cyberslug virtual life simulation

metry of the turn network to convert an avoidance turn to an orienting one and vice-versa, and 3) how and where odor memory is stored and the possible role of lateral inhibition in its processing. From these types of investigations and combined computational simulations (see cyberslug in figure), we hope to learn how a foraging animal may extract the economic qualities of Value, Reward and Risk-Assessment and how these qualities emerge in the neuronal computations of the cost-benefit decisions of foraging.

Members of the department, school, and their visitors are invited to visit us in the lab, in which our large aquarium contains at various times a variety of sea life under study for different aspects of foraging behavior. These include several charismatic sea-anenomes, three abalones (Abner, Absalom, and Abednego—mailed to us by mistake while our sea-slugs went to a restaurant in Indiana), a dwarf species of octopus and a small variety of sea-slugs and predatory starfish. □

Rhanor Gillette joined our department as assist. prof in 1978 and progressed through the ranks to professor in 1992. Along the way he spent time broadening his research interests with short stays at places like the Port Erin Marine Biol. Lab, IOM, UK; Duke U. Beaufort Marine Labs, Laboratoire Arago, Banyuls sur Mer, France; and the Stazione Zoologica Anton Dohrn, Naples, Italy. Indulging a passion for combined lab and field studies with teaching, he conducted a study abroad course at the Carmabi Marine Station, Netherlands Antilles this past winter. His research interests include decision making (above), cellular and molecular mechanisms of neuronal activity regulation, comparative neural physiology and behavior, and computer/robotic simulations of decision making.

MIP Family News

Send news to mip-news@life.illinois.edu

Bagchi Named University Scholar

Prof. Milan Bagchi has been selected as a University Scholar for 2009–10. The University Scholars Program was created to honor and reward outstanding faculty members at the university and includes a monetary award for the next three years to support his scholarly research. Only a very small number of faculty members are chosen as University Scholars each year, so Milan's selection is a signal honor for him and for the department. He joins Benita Katzenellenbogen, selected in 1989, as members of our faculty selected for this honor.

Milan was nominated for this position because of his outstanding research, which has made fundamental contributions to our understanding of steroid hormone action and the mechanisms involved in the regulation of uterine functions during embryo implantation. He played a key leadership role in establishing at UIUC the Center for Reproduction and Infertility Research, a national center of excellence that was funded in 2008 by the National Institute of Child Health and Human Development. He is an inspiring teacher and has provided extensive and valuable service to the university and his discipline. Our highest congratulations to Milan!

Katzenellenbogen Receives Brinker Award

Benita Katzenellenbogen has received the 2009 Susan G. Komen for the Cure Brinker Award for Scientific Distinction in basic science and clinical research for her work investigating breast cancer treatments. This is the highest award of merit given by the nation's leading breast cancer advocacy organization. Benita is being honored for pivotal laboratory work that led to a better understanding of how drugs like tamoxifen and raloxifene work on a molecular level to fight and prevent certain breast cancers.

Abramchecks Awarded 2009 Distinguished Alumni Award

Carla and Frank Abramcheck jointly shared the 2009 Distinguished Alumni Award, which was presented to them at the Departmental Retreat on May 1, 2009. Carla received a Ph.D. in 1988 working with Phil Best, and Frank in 1984 working with Sandy Helman. Both have gone on to exceptional careers in industry and provide great non-academic career role models for our students. They presented the keynote address at the retreat, describing their career experiences with great wit and with a recurring theme of how graduate training in MIP helped advance their careers in industry.



Carla and Frank Abramcheck receiving the 2009 Distinguished Alumni Award

In Memoriam

A long-time friend of the department, **Dr. Edwin E. Goldberg**, eighty-five, passed away on April 25, 2009 in Bonita Springs with his loving wife, Jeanne by his side. He was born on May 31, 1923 to Hyman and Cecilia Luft Goldberg. He married Dr. Jeanne Ellen Bullock in 1979.

Dr. Goldberg (affectionately known as "Dr. Ed") obtained his M.D. degree in 1949 and subsequently completed internal medicine residencies in England and Chicago. He then served as a captain in the Air Force, serving for two years as the chief of medical service for the 6604th USAF Hospital in Canada. After his military service, he moved to

Decatur, IL and practiced internal medicine there until 1986. During his years in Decatur, Dr. Ed received an appointment as a clinical professor of medicine at the University of Illinois School of Medicine at Urbana-Champaign (UICOM-UC). He enjoyed teaching the medical students and visited the UIUC campus regularly to lecture on various medical topics. His quick wit, personal warmth and charm, and his willingness to share his extensive medical knowledge made him a favorite among the students.

Drs. Ed and Jeanne supported the Medical Scholars Program at the UICOM-UC and endowed three separate professorial chairs in their names and in the names of Jeanne's parents in our department, the School of Molecular and Cellular Biology, and the School of Integrative Biology. They received the University of Illinois College of Liberal Arts & Sciences Dean's Quadrangle Award in 2001, and served as members of the President's Council at UIUC. We were honored to have them attend and speak at our department retreats on two occasions.

Dr. Ed was a man of many talents and will be missed for his kindness, spirit, vitality, intelligence, wit and charm.

This article was adapted from Jeanne's obituary in the Naples Daily News.

Dr. Anna Coble, who earned a Ph.D. in Biophysics with Floyd Dunn in 1973, and had an illustrious career at Howard Univ. in Washington, D.C., passed away on March 3, 2009.

Faculty/Staff Milestones

Professor Eric Jakobsson retired in August 2009 after thirty-eight years in the department. Eric received a B.S. in Chemical Engineering from Columbia University and worked in industry as an engineer for five years before earning a Ph.D. in physics at Dartmouth. After a brief postdoc, he came to Illinois as a research associate and visiting assistant

professor, before he joined the tenure track in 1972 and progressed up to professor. Additional university appointments were in the National Center for Supercomputing Applications and the Beckman Institute. At various times, he served as director of the Center for Biophysics and Computational Biology and of the Bioengineering program at UIUC, and Director of the Center for Bioinformatics and Computational Biology at the National Institute of General Medical Sciences. His major research interests are to use both bioinformatics and simulation to understand biological transport. He prefers the term "transition" over "retirement" and will continue his scholarly effort with as much vigor as before.

Prof. Joan Dawson retired in December 2008. Joan received a B.S. in biology from Columbia University and a Ph.D. degree in pharmacology at the University of Pennsylvania. She was a postdoctoral fellow at Columbia and University College in London and continued at University College as a Sharpey Scholar and Lecturer. She joined our department as an associate professor in 1985, and had additional appointments in the College of Medicine, the Department of Obstetrics and Gynecology, and Bioengineering. She served as associate director of the Biomedical Magnetic Resonance Laboratory here. Joan's research interests are to study the relationship between metabolism and function in living systems as simple as cells in culture and as complex as human subjects using nuclear magnetic resonance spectroscopy and spectroscopic imaging.

Prof. Richard Kollmar resigned in July 2009 to take a faculty position in the Department of Cell Biology at SUNY Downstate Medical Center in Brooklyn. Richard studies the molecular genetics of otolith formation in the ear using zebrafish as a model, and collaborated on a project to develop biomolecular electrodes for cochlear implants in the hearing impaired. We wish Richard well in his new position.

Former faculty member **Prof. John Willis** writes that he has retired from the University of Georgia and that his retreat from science was gradual, pro-

gressing from molecular and genetic studies of carriers in *C. elegans* to collaborative work on some unresolved questions from UIUC on sodium-potassium ATPases. He is keeping busy by staying fit at the gym, cooking heart-healthy meals, and political activities. His wife **Judy** continues an active research and teaching career at the Univ. of Georgia.

Denice Wells, Office Administrator extraordinaire, retired in May 2009. Denice worked for over thirty years for the University with stops in Chemistry and the Medical Scholars Program, before joining the MIP office in 1999. Denice will be spending more time on her passions: family, music, everything Illini, Cubs, and traveling to her favorite places. We will greatly miss her wit, ability to “take care of it,” and encyclopedic knowledge of the workings of the University. We wish her a happy retirement.

Alumni News



Greenleafs enjoying life in California

Taking advantage of the old saw that a picture is worth a thousand words, the picture shows great friends and supporters of the Department, **Carol and John Greenleaf** (Ph.D. 1963) on the balcony of their home clearly enjoying life in California. John’s thesis was on “Voluntary Dehydration in Man;” he worked with Dr. F. Sargent. Notably, his thesis was dedicated “To my wife, Carol, for her patience, understanding, and inspiration during the course of this study.” John was awarded the department’s Distinguished Alumni Award in 1998.

Melvin Bosma (Ph.D. 1966) and his wife **Gayle Bosma** (M.S.) have had distinguished careers at the Fox Chase Cancer Institute, which included developing the scid mouse, but are now turning their attention to retirement.

Ronald Hart (Ph.D. 1971) retired from the directorship of the National Center for Toxicological Research (one of the five FDA commissioners) to become their distinguished scientist emeritus. Nevertheless, he’s almost as busy as ever!

Bobby R. Scott (Ph.D. 1974, Biophysics) was a postdoc at Argonne National Lab before joining Lovelace Institute, where he is now a senior scientist. He received the 2008 International Dose Response Society’s Award for Outstanding Leadership.

Warren Schmidt (Ph.D. 1978, M.D. at U. Tenn.) has been our neighbor as a gastroenterologist at the University of Iowa with a primary specialty in liver diseases, particularly hepatitis C. Despite considerable clinical obligations, he has maintained an active basic and clinical research program since leaving Illinois. He recently received a Merit Review from the VA to examine the effects of heme

oxygenase oxidation products on hepatitis C replication and published a major study in *Hepatology* in Nov. 2008. His son has nearly completed a Ph.D. in physics at UIUC.

William F. Blakey (Ph.D. 1981) after postdoctoral training moved to the Armed Forces’ Radiation Research Institute in Bethesda where he is Senior Scientist and Scientific Advisory Member of the Biological Dosimetry group.

Michael Koban (Ph.D. 1984), a faculty member in Biology at Morgan St. Univ., writes that he had a good visit with Jon Levine (Neuroscience Ph.D., 1982) while at the Neuroscience meetings in Chicago. His group’s poster on brain changes underlying wakefulness in chronic REM sleep deprivation attracted an interview from SleepClinican.com which may be on-line soon.

Susan Lee (Ph.D. 1991, M.D. 1992) was a resident at Univ. Mich. and joined a firm of radiologists where she has become a partner. She attended a recent “Irradiating Illini” dinner at the Intern. Cong. of Radiation Res. Symposium in San Francisco.

Manjunath Ramarao (Ph.D. 1994) after a number of years with Wyeth Re-

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search has taken a position this year with Bristol Myers Squibb in a joint venture between BMS and Biocon (India) in India as director and head of applied biotechnologies. He moved in July 2009 from Boston to Bangalore, India, his hometown!

Jacqueline Payton (M.D. 2004, Ph.D. 2002) was recently promoted to medical director of the Molecular Diagnostics Laboratory at Barnes-Jewish Hospital. Her research focus is cancer genomics. Her husband, **Richard Perrin** (M.D. 2004, Ph.D.

2001) was recently promoted to Instructor in the Dept. of Pathology and Division of Neuropathology at Washington University. His research focuses on the identification of proteomic biomarkers for Alzheimer's disease, which he balances with his clinical work as a neuropathologist. Rick and Jackie have two children, Katie (age three) and Nicholas (one).

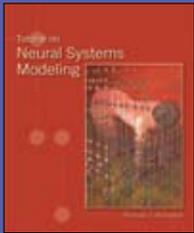
Jennifer Schultz-Norton (Ph.D. 2004, postdoc) joined the Millikin University Department of Biology as an as-

sistant professor of physiology in August of 2008.

Liang-Chuan Lai (Ph.D. 2005) is an Assistant Professor in the Graduate Institute of Physiology, College of Medicine, at the National Taiwan University. He is using microarrays to investigate changes in genes and gene expression in lung cancer in non-smoking women.

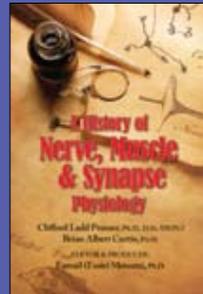
Sungsoon Fang (Ph.D. 2008) is a research associate with Dr. Ron Evans at the Salk Institute, San Diego. □

Book Announcements



A major new textbook, *Tutorial on Neural Systems Modeling*, by Prof. Tom Anastasio on computational neuroscience has just been published by Sinauer Associates. The book of 542 pages explains how to create computer models of systems of interacting neuron-like elements (or units). The theme that unifies all of the models is that the response properties of the units, which are compared with

those of real neurons, emerge as a consequence of the computation being performed. The link between observable properties and useful computations provides insight into the ways in which real neural systems may actually work.



Due for publication by Stipes Publishing Co. is a book entitled *A History of Nerve, Muscle and Synapse Physiology* that was started by the late Prof. C. Ladd Prosser and completed with Profs. Brian Curtis and Essie Meisami as coauthors and editors. In 600 pages and 24 chapters, the book traces the history of the development of the physiology and neurobiology of nerve, muscle and synapses from the seventeenth century to the late twentieth century.

The focus is on the historical development of facts, techniques and ideas regarding nerve, muscle and synapses. Brief biographies of the major personalities are provided by Prof. Meisami.

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