

Department of Biological Sciences

NEWSLETTER

THE UNIVERSITY OF IOWA



Table of Contents

- 1 Research & Teaching
- 2 Letter From the Chair
- New Faculty
- 3 New Technology
- Moving the Greenhouse
- 4 Teaching Lab Profile
- Faculty Activity
- 5 Staff Profile
- 6 Research & Teaching
- 7 Lepidodendron Tree Fossil
- 8 Undergraduates Awardees
- Teaching Lab Profile
- 9 Honor Roll
- 10 Faculty Speaker Invitations
- 11 Alumni News
- Obituaries
- Alumni Questionnaire



One Third of the Graduate Students in the Department of Biological Sciences. From The Left: Robbin Eppinga, Jason Caldwell, Arthur Pightling, Banoo Malik, Sara Sheeley, Kari Ann Lee, Angela Cordle, Shannin Zevian, Paulina Mena, Song Yi, Wei-Hua Lee, Wei Wu, Jie Huang, Shenglan Li, Tetyana Nosenko, Shengda Lin, Joshua Strable, Shaun Grosskurth, Lindsey Pingel, Kelley Foreman, Christina Freisinger, Shannon Jaacks, Raheel Ahmed, Xuxuan Wan

Research and Teaching

The Inseparable Functions of the University

"The University of Iowa seeks to advance scholarly and creative endeavor through leading-edge research and artistic production; to use this research and creativity to enhance undergraduate, graduate, and professional education, health care, and other services provided to the people of Iowa, the nation, and the world." This statement from the Iowa Promise, a strategic plan for The University of Iowa very concisely relates the importance of our research programs to our ability to adequately and appropriately fulfill our responsibilities to our undergraduate and graduate students.

We have 27 active research programs supporting 55 graduate students in our department participating in "leading-edge" research. Our faculty members support these research programs and most of the students through application to federal agencies such as the National Institutes of Health and Human Services, and the National Science Foundation, and from private foundations such as the March of Dimes, and the American Cancer Society. These extramural funds contribute over 6 million dollars per year in research funds, and for every one dollar of direct research funding the university

reaps 47 cents in operating costs, so the research itself and much of the infrastructure – facilities and services – that is required to support the programs is paid for through the efforts of the individual faculty members.

In this issue we focus on **Neurobiology** which, together with Cell & Development, Genetics and Evolution, comprise the four research specializations in which our graduate students can obtain their degrees. The Neurobiology group includes 9 faculty members: Michael Dailey, Jeffrey Denburg, Daniel Eberl, Steven Green, Alan Kay, Jack Lilien, Barbara Stay, Joshua Weiner and Chun-Fang Wu. Our neurobiology group focuses on cellular and molecular analysis of the nervous system, with a particular emphasis on the formation and function of connections between nerve cells (neurons). Each neuron in the nervous system connects with hundreds to thousands of other neurons through the extension of highly branched processes of two distinct types: long axons, which are principally for output, and shorter dendrites, which are primarily for inputs. The contacts, called synapses, are highly complex multifunctional yet modifiable structures that transmit information. Synapses also change



From the Chair



Jack Lilien, Ph.D.

The Results Are In!

In the last newsletter I alluded to our extensive “Self Study” and the impending review of our department by a group of 3 external and 2 University of Iowa professors. The “Self Study” was a careful assessment of our strengths and weaknesses in all areas and the external and internal reviewers received this document far ahead of the actual visit. During the visit the reviewers evaluated our undergraduate programs, the course offerings, and student evaluations of our courses.

We were gratified by the response of the reviewers to the changes we have made in our programs at both the undergraduate and graduate levels. They noted that the faculty had shown a sustained commitment and dedication to development of the department in new and positive directions. They particularly felt that our new undergraduate major tracks were a positive addition and that extending these emphasis areas to graduate programs and research foci was a sound basis on which to organize and focus the faculty. They were also very impressed with the quality of the new faculty we have hired over the last 5 to 10 years. Every one of these new professors has received excellent undergraduate teaching reviews and has developed an extramurally funded research program.

Our success is certainly a tribute to the efforts of our faculty, but we could not have come this far without the commitment of the University and the College of Liberal Arts and Sciences to our development. They have made a tremendous investment in us, making possible our growth and success. We hope that you will also continue to invest in our development.

I conclude with a quote from the written report of the review committee. “The future of the department should be one of optimism and excellence.”

Sincerely,

Jack Lilien, Ph.D.
Professor & Chair



Lilach Hadany, Ph.D.

New Faculty

Dr. Lilach Hadany is an evolution biologist. A native of Israel, she received her Bachelors degree in Biology at Tel Aviv U., as part of the university’s Interdisciplinary Program for the Fostering of Excellence. Her Ph.D. was earned in the School of Mathematical Sciences under the direction of Professors Ilan Eshel (Tel Aviv U.) and Uzi Motro (Hebrew U.). She joined our faculty and the Carver Center for Comparative Genomics within the Department of Biological Sciences in August, 2005 after a three-year postdoctoral sojourn in the laboratory of Marcus Feldman at Stanford U.

Dr. Hadany’s main research interest is variation in nature, specifically the evolution of mechanisms that generate variation. Her aim is to understand how natural selection shapes such well-recognized mechanisms as recombination, sex, mutation, migration, out-crossing and polyandry, as well as more subtle mechanisms such as senescence and stress-related death. For example, stressful environments would be expected to induce a higher generation of variation than mild ones. What drives the generation of variation in populations, individuals in populations, and even within an individual during a lifetime? She studies these questions using theoretical modeling together with experiments and analysis of empirical data. Understanding the role of variation in evolution she feels is key to predicting the repercussions of, for example, human-generated rapid changes in environments, increased life span, global transmission of pathogens and efficient global transportation that increases migration and out-crossings in humans and other animals.

Her other interests include study of 2nd-generation effects of fitness on recombination in *Drosophila*, the evolution of male-biased mutation and sibling competition in relation to the evolution of female multiple mating.

Dr. Hadany’s domestic partner, Tuvik Beker, founded a Silicon Valley company, Soligence, that specializes in computer modeling. His positions there are Vice President for Product Design and Chairman of the Board of Directors. Dr. Beker received his Ph.D. degree from Hebrew U. of Jerusalem in the field of neural computation.

New Technology

To adapt to the growing number of students exploring computational and statistical approaches to issues in Biology, the Department undertook expansion of the existing computer classroom this May. The new facility will accommodate an increasing number of students as the fields of bioinformatics and computational biology grow to encompass students from many disciplines.

The expansion of computer based research came with the revolutionary announcement of the completion of the first eukaryotic model organism. The availability of genetic data challenged scientists, who were accustomed to thinking about one gene at a time, to begin thinking globally about biological questions thus giving rise to the field of “Genomics”. The field of Genomics could not have emerged without the simultaneous growth and maturation of computers. Early in the process, neither computational power nor computational methods were in place to handle the data generated. The marriage of biology and computer science that came from the effort to generate and understand genome sequence data is known as “Bioinformatics”.

The University of Iowa’s Department of Biological Sciences offered one of the first courses in Genomics/Bioinformatics in 1997. As the genome sequences of ever more complex organisms were completed, including the completion of the human genome itself in 2000 the need to learn more about Genomics/Bioinformatics was apparent. Demand for the course increased every year, as the fields of bioinformatics and computational biology grew and encompassed students from many disciplines. In the fall of 2001, the course was officially expanded to better serve the needs of this increasingly diverse student body. The “Introduction to Bioinformatics” course was made a capstone requirement for Biology majors in the Genetics & Biotechnology track, and a year later became a required course in the Computational Genetics subtrack of the Genetics Ph.D. program.

In 2003 Biological Sciences began co-sponsoring a second course in Bioinformatics called “Statistics of Bioinformatics: Analysis of Microarray Data”. Like “Intro to Bioinformatics” the new course is multi-disciplinary and expected to continue to grow in popularity. The new facility accommodates more students, providing state of the art computational methodologies for our courses.



Ray Tallent, Ken Snyder

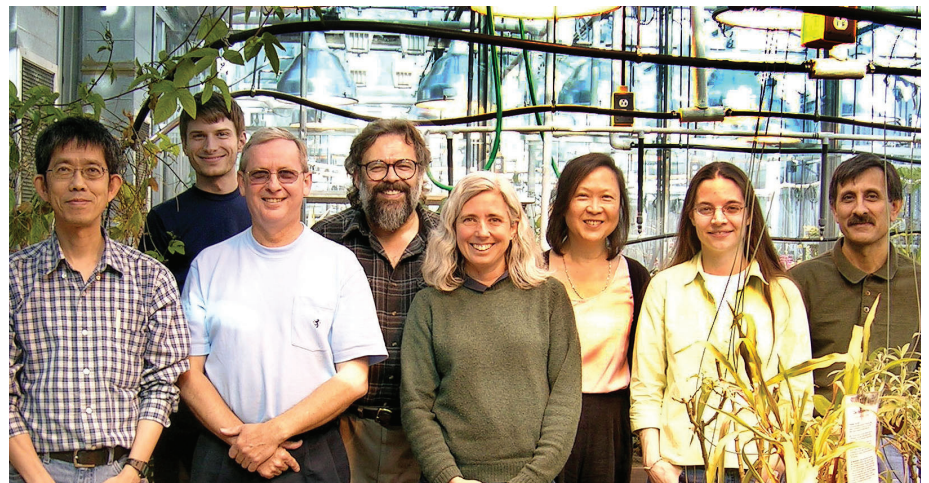
Moving The Greenhouse

In the fall of 2002, Ken Snyder, greenhouse supervisor, heard rumblings about a proposed Chemistry Building (CB) renovation that would require dismantling the 2700 square foot greenhouse. It was at this point that he began to inventory the greenhouse plants and prepare for a move that could only be done in warm weather. He knew this would take several months and possibly years to complete.

The BBE greenhouse is much smaller at 1700 square feet; the number of plants in the collection became an issue of concern. The Oakdale facility was an option, but had to be prepared to house plants; preparation included a general cleanup, installation of a watering system, and storage of production materials. One of the most difficult decisions involved which plants to move to BBE and which to take to the Oakdale facilities. The plants are harvested for use in several biology classes so effective planning and coordination with lab coordinators and faculty members became essential. Ken thought this would be a good time to hone and possibly add diversity to the

collection. Ken contacted Vander Vier Botanical Gardens in Davenport, Iowa, where he was able to trade some of the larger specimens for some specimens not currently in the collection, thus saving some specimens that would otherwise have been lost. Ken and Ray spent much of the summer of 2003 moving plants from CB to BBE, and Oakdale as well as trips to Vander Vier in Davenport. The CB greenhouse had no elevator and all items had to be moved in small quantities. Ken and Ray also had a few plant giveaways to help them decrease the overflow of the collection.

Ken was officially told that the move would take place in January of 2004; thankfully, Ken and Ray had already moved much of the collection, with plans to finish the move by the summer of 2004. The move has been successful, due to careful planning and foresight. Ken now coordinates tours of the BBE greenhouse for groups and individuals as requested, and is planning to do the same at the Oakdale facility.



Ming-Che Shih, Joshua Strable, Jonathan Poulton, Jeffry Schabillon, Erin Irish, Chi-Lien Cheng, Angela Cordle, Karim Gasimov



Teaching Lab Profile

Two months before the beginning of each semester, John Stefaniak is busy preparing for “The Big Show”. The Big Show refers to the coordination of biology teaching labs which teach 1,000 students in 40 labs. This is just for 3 classes: Principles of Biology I and II and Introduction to Animal Biology. The challenge requires excellent timing and coordination with teaching faculty of all necessary supplies for the labs. John’s position requires the ability to be flexible when problems arise. Knowledge of the resources available and the limits placed on those resources is very important for the efficient running of the labs all semester. John not only handles the resources for the labs but also listens to student concerns and troubleshoots any problems that may arise during the semester. John’s attitude is to look at the entire process as one big show.

Another of John’s talents is music. He has been playing bass fiddle since junior high school, and played throughout the Midwest while living in Milwaukee. When John came to Iowa City with his wife and three children, so she could attend graduate school here, he found it necessary to expand his repertoire from rock and roll to other forms of music, including country and jazz. On occasion, he played jazz with the late Writer’s Workshop director, Frank Conroy. Being the consummate teacher, he also taught music lessons at the Iowa City Guitar Foundation.

In his spare time John keeps himself busy working on the restoration project of the Englert Theatre in downtown Iowa City; his 1962 Mercedes and 1973 Volvo sports cars; and his house. John and wife Mary purchased a 1920’s farmhouse, which they have taken down to the support beams and restored. How does he manage to do all of this? His answer is that he doesn’t own a television.

Faculty activity

New Grants

W.J.O. Ballard awarded 3 grants, a 4 year grant from Brown University, “Nuclear-Mitochondrial Fitness Interactions in *Drosophila*”; a 1 year grant from the American Kennel Club, “Collection of Baseline Data for the Australian Cattle Dog Project 2020” and a 3 year grant from NSF, “Mitochondrial metabolism and Oxidative Efficiency in *Drosophila*”.

D. Bhattacharya awarded a 5 year grant from NSF, “Collaborative Research: AOTL: Assembling the Tree of Eukaryotic Diversity”.

J. Comeron awarded a 3 year grant from the Carver Foundation, “Carver Trust”.

S. Green awarded a 1 year grant from AHRF, “Role of JNK signaling in the death of spiral ganglion neurons after hair cell loss”.

J. Lin awarded a 4 year grant from Case Western, “Tropomyosin in the Antiangiogenic Activity of HKa”.

J. Logsdon awarded a 2 year grant from NSG, “Origins and Molecular Evolution of Meiosis” and a 3 year grant from NSF, “Collaborative Research: AOTL: Assembling the Tree of Eukaryotic Diversity”.

R. Malone awarded a 1 year grant from NSF, “Cell Progression Through Meiosis: A Signal from Recombination to the First Division”.

B. McAllister awarded 2 grants, a 4 year grant from NSF, “Genome Arrangement and Adaptive Evolution”; a 3 year grant from the Carver Foundation, “A Comparative Genomic Analysis of the Tempo and Mode of Sex Chromosome Evolution”.

J. Miller awarded a 3 year grant from NSF, “Collaborative Research: Phylogeny and Evolution of American Taxa of *Acacia* Subgenus *Acacia*”.

D. Slusarski awarded a 6 year grant from the American Cancer Society, “Mechanisms of Wnt/Calcium Antagonism of Beta-Catenin Activity”.

B. Stay awarded a 3 year grant from NSF, “Occurrence and Function of A-Type Allatostatins in the Termite *Reticulitermes flavipes*”.

C. Stipp awarded a 2 year grant from the March of Dimes, “Molecular Mechanisms of TM4SF2 Involvement in Non-Syndromic X-Linked Mental Retardation”.

J. Weiner awarded 2 grants, a 2 year grant from E. Matilda Ziegler Foundation, “The Role of ALCAM-Mediated Adhesion and Signaling in the Development of the Choroid and the Integrity of Ocular Structure”; a 1 year grant from the Edward Mallinckrodt Foundation, “The Role of Gamma-Protocadherins in Neuronal Survival”.

C.-F. Wu awarded 5 year grant from NIH, “The Developmental Biology of Cell Motility”.

New Appointments

as Panelists, Editors and Society Officers, etc.

J.W.O. Ballard was appointed to the National Institute on Aging RO3 Study section panel in 2004.

D. Bhattacharya was appointed to the NSF research grant panel on the Microbial Genome Sequencing Project, and to the editorial boards of *J. Molecular Evolution* and of *Botanica Marina*. Last year he also chaired the Darbaker Prize Committee, Botanical Society of America.

D.F. Eberl lectured and gave an electrophysiological practicum for the Neurobiology of *Drosophila* course at Cold Spring harbor, NY.

J. Frankel joined the Board of Scientific Advisors of the NIGMS/NSF Tetrahymena Genomic-Sequencing project.

G.N. Gussin has been appointed to a third consecutive three-year term to the editorial board of *J. Bacteriology*.

E. Irish was appointed to the editorial board of the *Amer. J. of botany* and to the Advisory Board of the Leopold center for Sustained Agriculture. She also served on a site visiting team for the NSF Plant genome Program.

B.F. McAllister was appointed a faculty member in the Faculty of 1000, Evolutionary/Comparative Genomics.

M.C. Shih has recently been appointed a panel member to the NSF’s Program on Graduate Research fellowships.

C.-F. Wu was appointed a member of the Ralph W. Gerard Prize Selection Committee, Society of Neurosciences, and an ad hoc member of the Advisory Committee on Life Science Institutes, Chinese Academy of Science, Shanghai, China.

Staff profile



Tom Koepfel joined the Department as our new Administrator in May. Tom has been with the University for 20 years, 19 of those with the Iowa Memorial

Union. There Tom managed Guest & Event Services, the Iowa House Hotel and most recently Marketing & Design. Tom has a BBA in Management and is working on his Masters in Organizational Leadership at St. Ambrose University. Tom and wife Barbara Herring have three teenagers; Maria is a sophomore at Loras College, and Josh & Emily are both at Iowa City High School. Welcome Tom!



Karla Daniels, Diana Kruse, Rachel Jorgenson, Karen Jensen, Les Jenkins, David Soll, Phil Gibson, Julie Collins, Nicole Kohler.



Ming-Che Shih, Ph.D. has accepted the position of Director of the Carver Center for Comparative Genomics (CCG). As chair he will work to recruit new faculty and expand

the research portfolio of center members. The administrator of the Genomics Center is Joseph Miller, Ph.D. Dr. Miller also oversees the operations of the DNA sequencer and functional genomics/microarray facility in the CCG. He has been managing the day to day operations since its conception in April of 2003. The Center collaborates regularly with the University of Iowa College of Medicine working with many faculty in interdisciplinary fields. As a result, the CCG has built a reputation on local, national and international levels within the scientific community.

The Development Studies Hybridoma Bank (DSHB) is housed within the Biological Sciences Department. The DSHB was initiated in 1986 by the Institute of Child Health and Human Development (NIH) to bank hybridomas and distribute monoclonals to the general scientific community in order to facilitate research. The Mission of DSHB is tri-fold. One is to keep the price of the monoclonals low so researchers can test multiple monoclonals without commitment of significant funds, then continue to utilize those of interest without worry of expense. Two is to relieve scientists of the time and expense of distributing monoclonals they had developed. Three is to assure the scientific community that monoclonals with limited demand would still remain available. We have strived over these many years to remain true to our mission. Since 1996 we have been completely self-sufficient, requiring no funds from NIH, and have been able to keep prices extremely low. The price of a 1 ml sample of supernatant will still cost only \$25, approximately one-tenth the average commercial price. The

DSHB continues to respond immediately to queries by customers concerning product quality and application. It has begun a two year plan to recline the major 200 lines for optimum antibody production and higher supernatant titers. It has also continued a program to generate monoclonal antibodies against the phosphorylated and unphosphorylated states of a variety of cytoskeletal and regulatory molecules. In addition, the DSHB provides antibodies used in Chlp-chip technology (c-myc), cell growth studies (BrdU) and stem cell identification protocols (SSEA-1, SSEA-3, SSEA-4 and FORSE-1). The DSHB now banks over 6—hybridoma cell lines. Last year the DSHB filled over 7,100 orders for researchers world-wide. The DSHB continually welcomes new monoclonal antibody contributions; investigators find this the most cost-effective means of making their antibodies available to the research community. The Bank is directed by Dr. David R. Soll. To contact DSHB: e-mail: dshb@uiowa.edu or visit the website: <http://www.uiowa.edu/~dshbwww/>

Anita Kafer, Chloe Allgood



The Interdisciplinary Ph.D. Program in Genetics has moved to the Department of Biological Sciences. Biology faculty member Debashish Bhattacharya has assumed the leadership of the Interdisciplinary PhD Program in Genetics. This

is one of the largest interdisciplinary programs at the University with over 50 faculty members and 40 graduate students. We are pleased to welcome Anita Kafer (left), the program administrator, and Chloe Allgood (right), whose time is split between offices on the third floor of BB and Medlabs in the College of Medicine.

Long Term Staff

This year we have had an unusually large number of service awards for long term members of our staff. Long term staff members are:

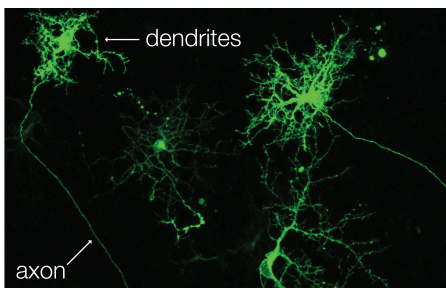
Diana Kruse	(10 years)
Edward Voss	(20 years)
Kuen Chan	(25 years)
Les Jenkins	(30 years)

Thank you for your hard work and dedication to our department! We also said goodbye to Ed Voss who worked in Professor David Soll's lab for his entire 20 years with the Department. He decided to retire to work on Mathematics and other hobbies.

Research and Teaching

Continued from cover

with time, depending on patterns of neural activity. We know that all people have the same senses and that we all perceive and react similarly to simple physical stimuli in our environment. However, we also know that peoples' responses to more complex situations are not identical; we all possess different memories and often act differently according to our different past experiences. Sadly, we also know that disease or disability can adversely affect our perceptions, behavior or memory. All this is reflected in the connectivity among neurons. The general patterns of connections are highly stereotyped, largely the same from one individual to the next, as are the trajectories and branching patterns of the axons and dendrites of each type of neuron. Yet the number, position, structure, and function of connections differ in detail among individuals. Neurological diseases and trauma destroy or alter neural connections and often kill the neurons themselves. The work-a-day concern of the neurobiologists in our department is the molecular machinery behind the formation of these patterned connections during development and their function in the mature nervous system. We are also concerned with the dynamic changes in these connections, which appear to be the cellular basis of learning and memory. These are challenging problems in that they



Ganglion cells in the intact neural retina of the chicken eye labeled with Green Fluorescent Protein.

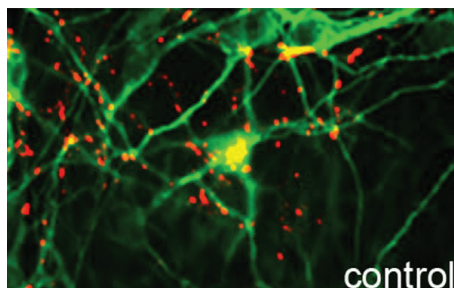
involve unraveling the molecular details of the nervous system — the most complex system in the known universe! However, solving these problems has great rewards in the basic understanding of our own behavior and how it can be affected by experience or by disease.

Our group investigates these problems in several different systems, a few highlights follow: **Jack Lilien** uses the neural retina of the eye to investigate questions about how axons and dendrites find their way

to their target partners. In the eye it is the retinal ganglion cells that receive visual input at their dendrites and convey that information to the brain via their axons. Above is a picture of one such ganglion cell, notice the long axon which will travel all the way to the visual centers of the brain and the bushy arbor of dendrites onto which contacts from the cells carrying information from the photoreceptors are made. Jack's lab investigates the details of the molecular machinery within growing axons that mediates their navigation to correct targets.

Jeffrey Denburg also studies the molecular machinery that guides axons to their targets. He is also studying how axon branches "talk to each other"; what happens at the terminal of one axon branch affects how other axon branches behave and the cross-talk is very rapid. Jeff is attempting to define the cellular mechanisms through which this type of cross talk occurs.

Joshua Weiner is the newest member of the neurobiology group, having joined the Department in August of 2004. Josh's lab investigates how the molecules that mediate adhesion between cells are critical for many stages of nervous system development, including neuronal migration, axon pathfinding, and synapse formation. A particular focus is on how the differential binding of members of families of adhesion molecules might control which partners a given neuron "chooses" to make synapses with, a central problem in understanding the patterns of connectivity. His laboratory uses transgenic mouse lines in which these adhesion molecules are deleted, truncated, or tagged with fluorescent proteins. With



Spinal cord neurons (green) cultured from mutant mice lacking one of the members of an adhesion molecule family (right) make many fewer synapses (red) than do control neurons (left). The mutant mice die shortly after birth and are unable to move, consistent with severe synaptic defects.

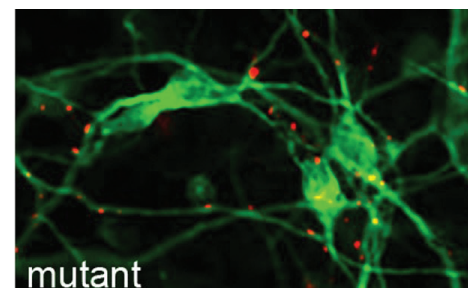
these tools, he can track the localization of the molecules and infer their functions by examining the phenotypes of animals in which they are mutated.

Alan Kay's research concerns an intriguing feature of synapses, namely that they release several very different types of molecules when active. In addition to the better-known neurotransmitters, essential for transmission of information, synapses release substances with more obscure yet crucially important roles. One such

substance is ionic zinc. This metal ion associates with several important structural proteins and enzymes in the synaptic space between nerve cells but its role in synaptic function remains something of a mystery. Alan has been studying the role of zinc in normal synaptic transmission and in a number of different pathological states like epilepsy, Alzheimer's disease and stroke where it may play a decisive role in the pathology.

Michael Dailey studies the hippocampus, a region of the forebrain involved in memory and learning. One focus of Mike's studies is the role of non-neuronal glial cells in synaptic function and in response to neural trauma. Another focus is the molecular machinery underlying dynamic changes in synapses. Such changes occur normally during the establishment of connections in the developing brain and in response to activity in the mature hippocampus, but occur aberrantly in diseases such as epilepsy. Several proteins with crucial roles in activity-dependent modifications of synaptic function become localized at synapses during developmental maturation of the neuron. Mike, together with Steven Green and others at UI, is investigating how these become localized at synapses, how they function in synaptic modifiability, and how their concentration and function at the synapse changes after epilepsy or stroke. A better understanding of these processes could lead to more effective treatments for such nervous system disorders in humans.

Steven Green primarily studies the auditory system, which is especially suitable for investigation of the role of synaptic



activity in regulating neuronal survival and synapse formation. Neurons of the cochlea transmit auditory information to the brain. They receive input from the auditory sensory "hair" cells. The loss of hair cells results in silencing of neural activity in the cochlea with consequent loss of synapses and neuronal viability. Steven investigates the molecules in the neurons that mediate these responses to neural activity or its loss. These function similarly in the brain, the basis of a shared interest with Mike

Lepidodendron Fossil

What (besides a dinosaur or Godzilla) is millions of years old, grew to be over 75 feet tall, weighs more than 16 tons, and is covered with scales?

In 1978 a spectacular *Lepidodendron* fossil (scale tree) was discovered by UI professor Jeffrey Schabilion in an abandoned strip mine near Pella, Iowa. Approximately 280 million years ago (long before the time of the dinosaurs) such trees grew in a tropical coastal swamp that existed in what today is central Iowa. Ancient storms and flooding resulted in portions of the swamp being buried under many feet of mud and fine sand. Most of the buried swamp plant remains were eventually compressed and reduced to coal. Incredibly one of the large scale trees was individually buried in the flood sediments and eventually exposed on the surface of a 15 ft X 12 ft X 3 ft block of stone. With the assistance of the Iowa

National Guard this block, weighing more than 16 tons, was removed from the strip mine and delivered to the UI for study. Because of the extraordinary completeness of that specimen it has been possible to make a very detailed reconstruction of the appearance of the living scale tree and to use that information in developing the UI Natural History Museum's diorama which gives visitors a glimpse of what life was like in Iowa's ancient coal swamps.

Initially, Professor Schabilion explored the possibility of housing the large scale tree specimen permanently displayed at the UI or at the Des Moines Botanical Center, or Coralville's new rain forest project. Eventually it was the Smithsonian Institution in Washington DC that agreed to provide a permanent home for the specimen. On June 3rd it began the journey to the Smithsonian where it will receive additional study and preparation before being put on public display. See the Biological Sciences website for more pictures of the fossil and preparation to move the fossil at: <http://www.biology.uiowa.edu/news.php>



Small *Lepidodendron* Fossil



Moving the big fossil to Smithsonian



UI faculty member Jeffrey Schabilion and Smithsonian Representative Pete Kroehler

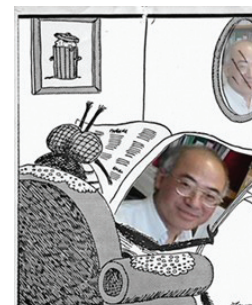
Dailey. Most deafness is the result of loss of hair cells so Steven's studies of cochlear neurons in rats and mice are relevant to deafness and, especially, to the cochlear implant, a highly effective neural prosthesis that directly stimulates cochlear neurons and is currently the only treatment for deafness.

Daniel Eberl also investigates the auditory system but with an emphasis on a basic question of hearing: how do auditory sensory cells convert sound vibrations into the electrochemical language of the nervous system? His work makes use of the fruit fly *Drosophila melanogaster*. Fruit flies can hear and, in fact, use rhythmic sound — a song sung by vibrating wings — as part of their courtship ritual. While fly "ears" differ structurally from those of vertebrates, they

share many of the same molecules and operating principles. The powerful genetic tools available with the *Drosophila* system provide a means to speed discovery of the mechanisms by which sound is perceived and analyzed. Indeed, *Drosophila* has always been the premier organism for genetic approaches because of its short generation time and the ease of keeping huge stocks of flies in the laboratory. Lest you question the relevance of the lowly fruit fly to human behavior; it is one of the great accomplishments of contemporary biology to have discovered that the genes that are responsible for a process in one organism are most often responsible for similar processes in all other animals, including humans.

Chun-Fang Wu has been instrumental in

developing the fruit fly, *Drosophila*, as a model system for studying the genes and therefore the proteins that underlie specific types of behavior. His work cuts to the very core of the nature versus nurture controversies. Chun-Fang's current



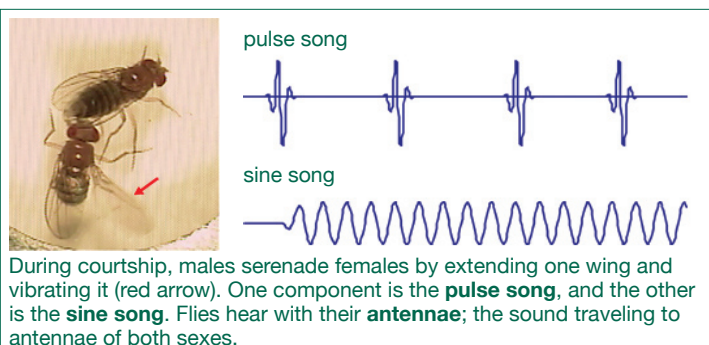
Dr. Wu and one of his behavioral fly mutants

research involves a combination of electrophysiological, anatomical, cell biological, genetic and behavioral techniques to get at the neuronal pathways that are responsible for specific behaviors.

His work also uses these tools to investigate basic mechanisms that allow information to flow along the axon and between neurons at synapses.

Barbara Stay is the senior member of the neurobiology group having had an active research laboratory for over 30 years. Barbara has been studying the connection, or crosstalk between the endocrine system and the nervous system in insects. She discovered a neuropeptide synthesized in the brain, allatostatin, which inhibits juvenile hormone synthesis. Juvenile hormone plays a central role in the regulation of reproduction and larval development in insects; high juvenile hormone limits progress through development, and in adult females cyclical amounts of the hormone regulate the reproductive cycle.

<http://www.biology.uiowa.edu/faculty.php>



During courtship, males serenade females by extending one wing and vibrating it (red arrow). One component is the pulse song, and the other is the sine song. Flies hear with their antennae; the sound traveling to antennae of both sexes.



Teaching Lab Profile

Each semester is variable with new and different challenges for Dr. Brenda Leicht, Lecturer and laboratory coordinator for the last 9 years in Biological Sciences. Brenda holds a Ph.D. in Genetics from Indiana University, with prior teaching experience at Penn State University.

Brenda coordinates Human Biology labs and the investigative labs of Cell Biology and Genetics and Biotechnology. Along with coordinating the lab materials, Brenda is also an Adjunct Professor teaching Human Biology and the Genetics and Biotechnology Lab. Brenda is responsible for having all prep and research materials ready for multiple labs, including materials for labs that require live organisms. She enjoys working with the variety of faculty members in the department, which changes based on her class assignment. Her role allows for flexibility, giving her the ability to come in at night to prepare the lab materials for the next day when necessary. Brenda and her husband, Dr. Kevin Leicht from the Department of Sociology, have two active children.

In the fall of 2004, Brenda took on the role of mentor for undergraduate teaching assistants, a new initiative in the Department. The goal of the program is to guide undergrads through one semester of teaching instruction, to be followed by a semester actually performing the role of lab instructor. This provides a valuable and practical set of skills for future instructors. Each summer Brenda takes advantage of development opportunities to science instructors, bringing back new information and techniques to share with the Department. This keeps our curriculum up to date with current teaching methods.

Brenda is a valuable asset to our teaching mission and a pleasure to work with; she has enthusiastically taken on any assignment requested of her. Her contribution is valued by students, faculty and the many TA's with whom she interacts daily.

Undergraduate Research Achievement Awardees

The Collegiate Scholar Awards are presented by the College of Liberal Arts and Sciences to undergraduate students who have achieved at the highest level during their years at The University of Iowa. The Department of Biological Sciences is pleased to announce that two of its graduating seniors, namely, Ms. Kija Heintz (Dailey Laboratory) and Ms. Jessica Middlemis-Brown (Blumberg Laboratory), were selected to receive these prestigious awards in 2005.

Robbie Prize

The Robbie Prize is given annually to an undergraduate senior Biology major who demonstrates excellence in course work and research, and who is preparing for a career in science. The award was established in 1969 with a bequest from the family of James P. Robbie (B.A., '64 in Zoology and Mathematics) in his memory. The award carries a prize of \$300 which includes a supplement from the Biology Department Development Fund.

The 2005 Robbie Prize was won by Ms. Jessica Middlemis-Brown, who graduated with High Distinction in December 2004 with a B.S. degree in Biology and a minor in Psychology. During her undergraduate career, Jessica undertook several independent research projects in behavioral neuroscience in the laboratory of Dr. Mark Blumberg (Department of Psychology). Data from one study that focused on behavioral responses to sleep deprivation in infant rats were presented as a poster at the International Society for Developmental Psychobiology meeting in 2004. Her research culminated in two publications in Behavioral Neuroscience (as first and second author, respectively) and one in Developmental Psychobiology (as third author). In Fall 2005, Jessica will begin graduate studies in evolutionary ecology at the University of Michigan, where she will work with Dr. Earl Werner, an authority on larval amphibian communities.

Evelyn Hart Watson Scholarship

The Evelyn Hart Watson Scholarship, part of a bequest to the Department from Mrs. Watson's estate, is awarded to a freshman Biology major with exceptional promise. It carries an award of \$500, renewable for three additional years assuming satisfactory progress towards an honors degree.

The 2005 Evelyn Hart Watson Scholarship will be shared between two worthy recipients. Mr. Adam Althaus graduated from Bishop Heelan High School, Sioux City, IA, in May 2004. Ranked top of his senior class of 149 students, he has achieved a 4.04 grade point average in his freshman year at UI. Ms. Sandra Imoehl is a May 2004 graduate of Oelwein Community High School, Oelwein, IA, where she graduated top in her class of 101 students. In her first year at UI, Sandra has achieved a 3.99 grade point average.

Clifford W. Hesselstine Scholarship

The Clifford W. Hesselstine Scholarship in Biology is awarded annually to an outstanding senior Biology major who has done noteworthy research, and/or is intending graduate work, with microorganisms. The award is a prize of \$1000.

Mr. Nicholas Lyons has been awarded the Clifford W. Hesselstine Scholarship in Biology for 2004-2005. Now entering his senior year with a 3.92 grade point average, Nicholas is undertaking research in the laboratory of Dr. Robert Malone on the genetics of meiotic recombination in yeast (*Saccharomyces cerevisiae*). His work focuses on the SPO11 gene, one of ten genes whose protein products are believed to play key roles in delaying the first division of meiosis, allowing time for recombination intermediates to be resolved before homologous chromosomes are pulled apart.

Honor Roll

of 2004 Contributors

This honor roll gratefully recognizes graduates, faculty, and friends who contributed \$100 or more in 2004 to the Department of Biological Sciences through The University of Iowa Foundation, the University's preferred channel for private support. Contributors are listed alphabetically. A (PC) follows the names of those who qualified for membership in the College of Liberal Arts and Sciences Dean's Club Patrons Circle by contributing \$2,500 or more to any area in the College of Liberal Arts and Sciences in 2004. Contributors of \$1,000 to \$2,500 in 2004 qualify for the College of Liberal Arts and Sciences Dean's Club, which is indicated by a (DC) following their names.

Allhiser, Carin L., Appleton, WI
Allhiser, John N., Appleton, WI
Arens, David E., Des Moines, IA
Arens, Marsha L., Des Moines, IA
Bagnara, Joseph T., Tucson, AZ
Bagnara, Mary Louise, Tucson, AZ
Baker, G. E., Peoria, AZ
Barch, Abram M., East Lansing, MI (DC)
Barch, Stephanie H., East Lansing, MI (DC)
Bibb, Brenda J., Kingston, RI
Bibb, Harold D., Kingston, RI
Brown, Susan E., Iowa City, IA
Buffo, Jeffrey J., Cedar Rapids, IA
Burns, Elizabeth A., Grand Forks, ND
Cairns, J. Scott, Mercer Island, WA
Roy J. Carver Charitable Trust, Muscatine, IA (PC)
Cech, Annette M., Des Moines, IA
Cech, Robert F., Des Moines, IA
Cherwin, Jerrold L., Arlington Heights, IL
Cherwin, Jessica M., Arlington Heights, IL
Chouinard, Scott W., Medford, MA
Dahl, Carol A., Mercer Island, WA
Dale, Edwin, Athens, GA (DC)
Decker, Marlene L., Chicago, IL
Decker, Robert S., Chicago, IL
Dingus, Jane, Mount Pleasant, SC
Easton, Douglas P., Tonawanda, NY
Edwards, Kevin B., Milwaukee, WI
Foulkes, Kathryn M., Rock Island, IL
Foulkes, Robert H., Rock Island, IL
Frankel, Anne W. Koopmans, Iowa City, IA (DC)
Frankel, Joseph, Iowa City, IA (DC)
Fribourgh, Cairdenia M., Little Rock, AR
Fribourgh, James H., Little Rock, AR
Gussin, Gary N., Iowa City, IA

Harbour, Laurel J., Leawood, KS (PC)
Hemesath, Timothy J., Natick, MA
Herman, Michael A., Manhattan, KS
Hildebrandt, John D., Mt. Pleasant, SC
Hill, Hazel D., Bloomington, MN
Holbrook, Mark A., Iowa City, IA
Howar, John W., Twin Falls, ID
Howar, Linda D., Twin Falls, ID
Jaeger, Erich B., Emeryville, CA
Jefson, Jerry A., Lafayette, IN
Johnson, Gwen M., Moorland, IA
Johnson, James L., Moorland, IA
Kaung, Hue-Lee, Lyndhurst Mayfield, OH (DC)
Kirchner, Frederick R., Peru, NY
Kirshbaum, Thomas H., Birmingham, AL. (PC)
Kleopfer, Lynn L., Columbia, MO
Kollros, Jerry J., Iowa City, IA (PC)
Kroeger, Linda, Manhattan, KS
Lansing, Jeanne G., Cary, NC
Lansing, Timothy J., Cary, NC
Lawson, Jeffrey H., Durham, NC
Lin, Jenny Li-Chun, Iowa City, IA (DC)
Lin, Jim Jung-Ching, Iowa City, IA (DC)
Lynch, Carol Becker, Boulder, CO (DC)
Lynch, G. Robert, Boulder, CO (DC)
Magrane, Diane M., Potomac, MD

Mather, Marilyn Fontaine, Peru, NY
Maxson, Linda, Iowa City, IA (DC)
Maxson, Rick, Iowa City, IA (DC)
Mintz, Beatrice, Elkins Park, PA (DC)
Mohler, Bobby A., Waldport, OR
Mohler, James D., Waldport, OR
Ostedgaard, David Lee, Iowa City, IA
Ostedgaard, Lynda S., Iowa City, IA
Reynolds, W. Ann, Key West, FL (PC)
Rice, David R., Jacksonville, FL (PC)
Rice, Joan E. Sorensen, Jacksonville, FL (PC)
Ring-Easton, Rosellen, Tonawanda, NY
Sampsell, Bonnie M., Chapel Hill, NC
Schardein, James L., Chelsea, MI
Schmidt, Jean M., Mesa, AZ
Sedar, Jean Dimmitt, Cherry Hill, NJ
Segal, Harriet F., New York, NY
Segal, Sheldon J., New York, NY
Shimkat, Judy, Fort Dodge, IA
Sjolund, Richard D., Solon, IA
Sjolund, Rina, Solon, IA
Smith, Blanche, Los Angeles, CA
Smith, Phillip M., Sr., Los Angeles, CA
Stransky, Donna Jean, Waco, TX
Stransky, Frank W., Waco, TX
Sullivan, Anne L. S., Coralville, IA
Sullivan, Michael J., Coralville, IA
Vander Zwaag, Barbara A., Kelseyville, CA
Vander Zwaag, Benjamin H., Kelseyville, CA
Von Eschen, LeAnn K., Columbia Heights, MN
Wang, Hwei-Gene Heidi, Hamden, CT
White, Carolyn M., Arlington Heights, IL
Williams, Norman E., Iowa City, IA (PC)
Yen, Kwang-Mu, Thousand Oaks, CA
Zallek, Chris, East Peoria, IL
Zinser, Roger A., Grand Forks, ND

Graduate Friends & Alumni Fellowship Fund

This new fund has been created to provide support for our graduate students, a critical component to our success. Salary and tuition costs exceed \$26,500 annually for each student; in order to attract and retain the best and the brightest, we need your help to meet this growing expense. Your generous donations are greatly appreciated.

Faculty Speaker Invitations

J.W.O. Ballard Gave two invited international presentations, to the International Congress on Aging, Aussois, France, and at the U. of New South Wales, Australia. In addition, he gave talks at the 2004 Evolution Meeting, Fort Collins, CO; Iowa State U.; and Integrated DNA Technologies, IA.

D. Bhattacharya Presented symposium talks overseas, "Updating the tree of life", in: A genomic and Phylogenetic Perspective on Algal Evolution, Geneva, Switzerland, organized an NSF-sponsored Gordon Conference on Marine Microbes, Roscoff, France and gave the paper, "Plastid-based phylogeny of photosynthetic eukaryotes" and a talk at the XVII International Seaweed Symposium, Bergen, Norway. He also spoke at the NSF MGSP Annual meeting, Arlington, VA, U. of Maine School of Marine Sciences, the U. of Texas, Austin, the NOAA-National Ocean Service, Charleston, SC, and the annual meeting of the Society of Protozoologists, Bryant College, RI.

M.E. Dailey spoke at the Federation of European Neuroscience Societies Forum 2004, Lisbon Portugal, "Dynamics of spine and synapse formation in live developing hippocampal tissue slices". Other talks, "Microglia on the move: The dynamics of microglial activation and cell-cell interactions in live brain tissue slices", to the annual meeting of the Amer. Assoc. of anatomists, Washington, D.C.; to the Dept. of Pharmacology, Physiology and Therapeutics, U. of North Dakota.

D.F. Eberl presented the talk, "The sound of one wing flapping: Mechanisms of Hearing in *Drosophila*", to the W.M. Keck Center for Behavioral Biology, N.C. State U., Raleigh, NC.

S.H. Green co-organized the 1st Williams Conference on Tissue Engineering the

Inner Ear, Ann Arbor, MI and gave one of the talks. Also, he was invited to speak to the dept. of Physiology and Biophysics, U. Washington, Seattle, WA, "Mechanisms by which neural activity promotes neuronal survival but inhibits synaptic maintenance". The same topic was presented at the Assoc. for Research in Otolaryngology (Symposium on Neurotrophin-Induced Neuro-Protection), Daytona Beach, FL and to the Dept. of Biochemistry, Weizmann Institute of Science, Rehovot, Israel.

S. D. Hendrix presented a talk at the national 14th Annual Prairie Invertebrate Conference.

A.R. Kay was invited to give talks at the U. of Paris, University College, London U. and at a conference entitled, Zinc Signals 4 at Aarhus, Denmark.

J. Lilien spoke and was session chair at the Timberline Conference on Epithelial Polarity and gave a talk at the annual meeting of the Society for Cell biology and a Gordon Research Conference on cell adhesion.

J.J.-C. Lin presented talks on the Molecular Basis of Cell Motility, to the Dept. of Anatomy, National Yang-Ming U. Taipei, Taiwan and to the Rotary Club, Peikang, Yulin, Taiwan. Other talks, on a novel intercalated disc protein, Xin, in cardiac development and function, was given to the Dept. of Physiology, National Defense medical Center, Taipei, Taiwan, to the Boston Biomedical Research Institute, Boston and to the dept. of Cell and Developmental Biology, U. North Carolina, Chapel Hill, NC.

B.F. McAllister spoke on the subject of the *Drosophila virilis* genome at a meeting, *Drosophila* Comparative Genomics: Progress and Prospects, U. of Arizona, at the *Drosophila* Species Workshop, Tucson

Stock Center, U. of Arizona and at the *Drosophila* Comparative Genome Analysis Workshop, Harvard U. Also, he gave a talk, Evidence for adaptive variation affecting the maintenance of polymorphic chromosomal arrangements in *Drosophila Americana*, Colorado State U. Fort Collins.

M.C. Shih was a speaker and session chair at the International Workshop on Comparative Genomics of Domesticated Organisms, Beijing, China, and the International Workshop on the Application of Biodiversity to Biotechnology, Pinh-Tung, Taiwan.

D.C. Slusarski presented a talk in the symposium, Calcium Function in Development and Disease, Hong Kong.

D.R. Soll was the chair and speaker in the Opening Section of the ASM Candida meeting, and a speaker in the Summation Section, Austin, TX. He also gave talks to the Institute of Physics and Biology, Rockefeller U., NY, and to the Pasteur Institute's, Imaging Facility and the Molecular Mycology unit, Paris, France.

B. Stay spoke at the Eighth International Conference on Juvenile Hormone, Lake Tahoe, CA. She also gave a talk to the Dept. of Biology, University of Minnesota at Duluth.

C.-F. Wu was Co-Organizer and Co-Chair of the symposium, Genetic Model Systems for Biomedical Research, at the 10th International Symposia and Workshops, Soc. of Chinese Bioscientists, Beijing, China. He also spoke at the 10th European Symposium on *Drosophila* Neurobiology, Neuchatel, Switzerland and the International Symposium on Genetic Model Systems for Neuroscience Research, Brain Research Center, University System of Taiwan, Taipei.

Obituaries

Anderson, George H., M.D., B.A. (Zool) '32
Apple, Richard L., B.A. (Zool) '69
Besser, Edward L., M.D., BA (Zool) '33
Burke, James C., Lt. Col., M.S. (Zool) '52
Davis, Clarence E., M.S. (Zool) '51
Eberhard, John F., M.S. (Zool) '51
Eigenbrodt, Glen L., M.S. (Zool) '51
Elmets, Harry B., M.D., B.A. (Zoology) '42
Eystone, Bernard L., B.A. (Botany) '35
Gaffron, Marie E., M.S. (Zool) '41
Hedberg, Christopher L., M.D., B.S. (Botany) '83
Hill, Aaron C., B.A. (Biol) '99
Hughes, Doran L., M.S. (Botany) '58
Jackson, William L, Jr., M.D, B.S. (Zool) '66
Johnson, Donald C., Ph.D. (Zool) '56
Kirkner, Frank J., Ph.D. (Zool) '31
Lobdell, Wentworth W., B.A. (Zool) '32
Spencer, William A., M.D., B.A. (Zool) '42
Wolcott, Lester E., M.D., B.A. (Zool) '47

Alumni NEWS

Farr, Marie L., Ph.D. (Botany), '57 has retired to Florida after a career in the U.S. Department of Agriculture.

Gammon, Gertrude E., (Kellogg), M.S. (Botany) '46 taught biology at the Eagle Grove (IA) High School and Junior College (1946-48) and then embarked on missionary work in Natal South Africa as a teacher in the Evangelical Teacher Training College, then the Franson Christian High School in Swaziland. After retirement and currently, Mrs. Gammon and her husband visit residents in Iowa care centers.

Hoffman, Glenn L., PhD (Zool.) '50 has moved to a retirement community in Bethlehem, PA to be near his son, Dr. G. Lyle Hoffman who is Head of Physics at Lafayette College. Dr. Hoffman, who studied at the UI with Prof. Owen Nolf, was formerly a research parasitologist with the U.S. Fish and Wildlife Service.

Kellogg (see Gammon)

MacIntosh, Susan, B.A. (Zool), '74 recently moved to Research Triangle Park, NC to continue her work for Bayer CropScience (BCS). She has just been promoted to Vice President of Regulatory Affairs in the BioScience Division which is the seed and biotechnology part of BCS. She leads a team of 40 people in 15 different countries, with a budget of more than \$12 million. Her background for this position after obtaining her degree included 10 years of work on insecticidal proteins. She moved into regulatory affairs just as transgenic plants were being commercialized.

Sehe, Charles T., Ph.D. (Zool) '57 is a naval veteran of WWII who survived the Pearl Harbor attack and served in the Pacific theatre, the Aleutian Islands campaign and the invasion of Europe. Under the G.I. Bill of Education, he attended North Central College (Naperville, IL) where his studies in zoology were guided by Prof. Warren Keck (PhD, UI '34). Upon graduation in 1950, he entered the UI as a graduate student, studying with, among others, J.H. Bodine and E. Witschi. To help with finances, he was a TA with Witschi, R.L. King, and J.J. Kollros and cared for the grasshopper colony of E. Slifer. He fondly recalls delivering three lectures in comparative anatomy for Kollros when the latter was down with mumps!! He conveys especially fond appreciation for Prof. Kollros' teaching, personal attitude and leadership of the Department of Zoology. Prof. Sehe retired in 1990 from the Biology Dept. of Mankato State U (Minn). Currently, he is conducting oral history interviews among WW II veterans for the National Veterans History Program.

KEEP IN TOUCH ALUMNI QUESTIONNAIRE

Name _____

Address _____

Business Address _____

Position _____

Professional Society meetings that you attend _____

Please send me more information:

- Alumni gatherings at meetings
- How I can help graduate recruiting
- Membership in the Alumni Advisory Board
- Department needs for private support
- Other (please specify)

News about you:

PLEASE SEND THIS PAGE IN THE ATTACHED ENVELOPE WITH ALL OF YOUR UPDATED INFORMATION TO DR. EUGENE SPAZIANI, THE UNIVERSITY OF IOWA, 143 BB, IOWA CITY, IA 52242-1324 OR EMAIL: Eugene-spaziani@uiowa.edu.



Lepidodendron (Scale Tree) fossil, donated to the Smithsonian - See page 7

Department of **Biological Sciences**

visit our website at: www.biology.uiowa.edu
or call us at 319-335-1050

NEWSLETTER

THE UNIVERSITY OF IOWA



THE UNIVERSITY OF IOWA
Department of Biological Sciences
143 Biology Building
Iowa City, IA 52242-1324

Nonprofit Organization
U.S. Postage
PAID
Permit No. 45
Iowa City, IA