



School of Integrative Biology

University of Illinois at Urbana-Champaign

news

summer 2008

Renewable energy

Initiative will put Illinois at forefront of farm bioenergy production

by Diana Yates and Gary Beaumont

Stephen P. Long, Robert Emerson professor of Plant Biology and Crop Sciences, has been named leader of the University of Illinois' component of the Energy Bioscience Institute (EBI). This \$500 million research program was announced February 1, 2007, by the energy company British Petroleum (BP). Illinois joins the University of California, Berkeley, and Lawrence Berkeley National Laboratory in forming the EBI, with UC-Berkeley taking the lead.

On the Urbana-Champaign campus, 340 acres of farmland will be used to study the production of plants for biofuels. The research team will explore potential benefits of using corn crop residues, switchgrass, *Miscanthus* (*Miscanthus x giganteus*, a hybrid grass that can grow 13 feet tall), and other herbaceous perennials as fuel sources. The initiative will explore how adequate supplies of high quality plant biomass can be sustainably produced and used in



Miscanthus at maximum biomass, topping 11 feet, shown with Emily Doherty for contrast. Photo by S. Long.

facilities that convert biomass to fuels.

"The proposal from UC-Berkeley and its partners was selected in large part because these institutions have excellent track records of delivering 'big science'—large and complex developments predicated on both scientific breakthroughs and engineering applications that can be deployed in the real world," said BP group chief executive John Browne. "This

program will further both basic and applied biological research relevant to energy. In short, it will create the discipline of energy biosciences. The Institute will be unique in both its scale and its partnership between BP, academia, and others in the private sector."

Previous support from the Illinois Council for Food and Agricultural Research enabled Illinois scientists

continued
on page 6



This newsletter is published by the School of Integrative Biology, University of Illinois. Subscriptions are free.

School of Integrative Biology

Fred Delcomyn, Director
University of Illinois
at Urbana-Champaign
286 Morrill Hall
505 S. Goodwin Ave.
Urbana, IL 61801 USA
phone: 217/ 333-3044
fax: 217/ 244-1224
email: sib@life.illinois.edu

Departments and Programs

Animal Biology

Ken N. Paige, Head

Entomology

May R. Bernbaum, Head

Plant Biology

Evan H. DeLucia, Head

Ecology, Evolution, and
Conservation Biology

Jeffrey D. Brawn, Director

Physiological and Molecular
Plant Biology

Stephen Moose, Director

To make a gift to the School,
contact:

Dr. Kathy Carter, Director of
Advancement
University of Illinois
286 Morrill Hall
505 S. Goodwin Ave.
Urbana, IL 61801 USA
phone: 877/ 265-4910 (toll free)
email: kacarter@illinois.edu

www.life.uiuc.edu/sib/



In this my last column as Director of the School of Integrative Biology, I think it is worthwhile to reflect on how far we have come since the decision to split the School of Life Science (SOLS) into molecularly and organismally oriented units. There was, of course, the obvious challenge of reallocating financial and other resources of SOLS to two new units. The most important activity for both Schools, however, was to develop and articulate a new course of study based on the areas of biology in which each School would concentrate. For the School of Integrative Biology, that meant developing a curriculum that would allow students to gain familiarity with the diversity of plant and animal life on the planet, how this diversity came to be, and how the organisms that represent this diversity interact.

Remarks from our graduating seniors on the University's survey suggest that we have been successful in this goal. Although the biology general curriculum is no longer available, the IB major provides our students with the broadest possible training in the biological sciences. Our core courses in Form and Function, Ecology, Genetics, and Evolution, coupled with selected courses in molecular genetics or biochemistry, prepare students for any kind of career in biology—from the medical professions to advanced study and intensive research in a specialized field.

As we move forward, we continually seek to improve the value of what we offer. We improve value by encouraging more students, through our advising office, to be engaged in learning about the careers for which the discipline of integrative biology prepares them.

We also improve value by making sure that prospective (and even current)



students have a positive impression of integrative biology and are fully aware of its breadth and scope.

We can do this in part by presenting an informative website that is at the same time attractive, easy to use, and helpful. Any user, from an alumnus who graduated decades ago to a high school junior looking ahead to college biology, should find something interesting and valuable on our site. It should also, of course, be useful for current faculty, staff, and students. We have been engaged in the process of designing and developing such a site for over a year now, and although it may not be ready by the time you receive this newsletter, it won't be long! I think you'll be quite pleased with the result. If you would like to receive an email notification when it goes live worldwide, just send a message to sib@life.illinois.edu.

When you check out the site, look especially at the link *For Alumni*. Here you will find a variety of features that will help you keep up with former classmates and professors.

It has been a privilege to serve the University of Illinois and its biological science community as Director of the School of Integrative Biology. I know the School will be in good hands under the new leadership of Evan DeLucia.

—Fred Delcomyn

Major new facility opens on campus

After six years of planning and construction, the \$75 million, 186,000 square-foot, state-of-the-art Institute for Genomic Biology (IGB) facility was officially dedicated in March 2007. The facility will ultimately house up to 400 researchers in systems biology, cellular and metabolic engineering, and genome technology.

The design of the new building facilitates collaboration between researchers and provides space to advance technology transfer, education, and engagement with partners in genomic biology. State funds were used for construction and provide for daily operation of the facility, while research programs are supported largely through funding from the federal government, corporations, and foundations. There are currently nine research themes housed at the IGB, as well as the Energy Biosciences Institute (*see cover story*).

Integrative Biology faculty and affiliates are involved with three of these major research themes.

Genomic ecology of global change. This theme group is examining how changes in networks of genes affect ecosystem metabolism when challenged by elements of global change, how information obtained from genomes and metabolomes may be used to predict the effect of environmental changes on ecosystem function, and how this information can be formulated into an overarching framework of mathematical



The Institute of Genomic Biology, looking at the west side grotto.

modeling. The team includes **Donald R. Ort** (theme leader, Plant Biology, USDA/ARS), **May R. Berenbaum** (Entomology), **Hans J. Bohnert** (Plant Biology), **Evan H. DeLucia** (Plant Biology), **Andrew D.B. Leakey** (Plant Biology), and **Stephen P. Long** (Plant Biology). Affiliated are **Elizabeth A. Ainsworth** (Plant Biology, USDA/ARS), **Steven C. Huber** (Plant Biology, USDA/ARS), **Ray R. Ming** (Plant Biology), and **Raymond E. Zielinski** (Plant Biology).

Genomics of neural and behavioral plasticity. This theme group examines “neurogenomic decision-making systems” in a diverse array of animals, both in the lab and in the field. This team includes **Gene E. Robinson** (theme leader, Entomology), **Kimberly A. Hughes** (Animal Biology), and **Hugh M. Robertson** (Entomology). Also affiliated with this theme are **Berenbaum**, **Sydney A. Cameron** (Entomology), **Rebecca C. Fuller** (Animal

Biology), **Andrew V. Suarez** (Animal Biology), and **Charles W. Whitfield** (Entomology).

Molecular bioengineering of biomass conversion. This theme group is using a horizontal research strategy to address fundamental challenges along the entire biomass chain—from feedstock input to conversion processes, and ultimately production, recovery, and utilization. **Bohnert** is one of the team members.

Other research themes are bio-complexity; business, economics and law of genomic biology; host-microbe systems; mining microbial genomes for novel antibiotics; precision proteomics; and regenerative biology and tissue engineering.

The IGB at the University of Illinois was established in 2003. Its goal is to advance life science research and stimulate bioeconomic development in Illinois. Harris A. Lewin, professor of Animal Sciences, is the director.

Govindjee, professor emeritus of Plant Biology, received a Lifetime Achievement Award from the Rebeiz Foundation for Basic Research and the Communication Award from the International Society of Photosynthesis Research.

Kimberley A. Hughes, associate professor of Animal Biology, was selected to serve as a member of the Genetic Variation and Evolution Study Section, Center for Scientific Review for the National Institutes of Health. Study sections review grant applications submitted to the NIH national advisory council or board and survey the status of research in their fields of science.

Donald R. Ort, professor of Plant Biology and USDA/ARS, received the Charles F. Kettering Award by the American Society of Plant Biologists in recognition of his excellence in the field of photosynthesis. In addition to investigating plant responses to global atmospheric change, he has been a leader in the development of the open-air, gas-concentrating field system, SoyFACE, that fumigates large areas of crop plants with enriched levels of carbon dioxide and/or ozone. Ort was also named an Inaugural Fellow of the American Society of Plant Biologists, recognizing his distinguished and long-term contributions to plant biology and his service to the society.

Stephen P. Long, Robert Emerson professor of Plant Biology and Crop Sciences, was awarded an honorary doctor of science degree from Lancaster University, one of the United Kingdom's top twenty universities. He has served on committees for research on global climate change for the European Union Cooperation in Science and Technology initiatives, the United Nation Environment Program, the U.K. Natural Environment Research Council, and the U.S. Department of Energy.

Sydney A. Cameron was promoted to associate professor in Entomology, and **Feng Sheng Hu** was promoted to full professor in Plant Biology.



Stewart H. Berlocher, professor of Entomology, was chosen for his contributions to the understanding of evolution and speciation, particularly sympatric speciation in phytophagous insects.



Stephen P. Long, Robert Emerson professor of Plant Biology and Crop Sciences and deputy director of the Energy Biosciences Institute, was recognized for his contributions to the understanding of the physiological responses of natural and agronomic ecosystems to global change.

New AAAS Fellows of the American Association for the Advancement of Science



Steven C. Huber, professor of Plant Biology and Crop Sciences, plant physiologist with the Agricultural Research Service of the U.S. Department of Agriculture, and affiliate of the Institute for Genomic Biology, was honored for seminal research in plant carbon and nitrogen metabolism, regulation of carbon/nitrogen metabolism, and regulation of carbon/nitrogen interactions by protein phosphorylation.



Sydney A. Cameron, associate professor of Entomology and affiliate of the Institute for Genomic Biology, was selected for her contributions to evolutionary biology, particularly the innovative use of molecular systematics to provide important new insights into the evolution of bees.



Ken N. Paige, professor and head of Animal Biology, was selected for his seminal work on overcompensation in plants and pioneering work on the application of molecular genetic techniques to enhance understanding of ecological and evolutionary processes.

Robinson named Swanlund Chair



Gene E. Robinson was recently named Swanlund Chair, the highest endowed title at the University of Illinois. Robinson is professor of Entomology, director of the Bee Research Facility, director of the Neuroscience Program, and leads research on neurogenomics at the

Institute for Genomic Biology. He has authored or co-authored more than 200 publications, pioneered the application of genomics to the study of social behavior, and heads the Honey Bee Genome Sequencing Consortium. Robinson has been honored as a University Scholar (1993), Fulbright Fellow (1996), Guggenheim Fellow (2003), G. William Arends professor of Integrative Biology (2002-2007), and is a fellow of the Animal Behavior Society (2006). He is also a member of the American Academy of Arts and Sciences (2004) and the National Academy of Sciences (2005). He joined the faculty in 1989.

Robinson joins 15 other scholars, including **May R. Berenbaum**, head of Entomology, who have been appointed as a Swanlund Chair in the past. This endowment was made possible by a gift from alumna Maybelle Leland Swanlund, who received a degree in library studies from Illinois in 1932 and who died in 1993. She provided a \$12 million endowment for chairs to attract leaders in the arts and sciences at the University and to recognize current faculty members who have made exceptional contributions in their fields. The awards are for five years and may be renewed.

New degrees, name, and mission for graduate program

When the School of Integrative Biology (SIB) was created in 1999, the graduate program in Ecology and Evolutionary Biology (PEEB) was also established to provide an interdisciplinary home for graduate training in ecology, evolutionary biology, and related fields. The program quickly grew, attracting faculty from twelve departments and five colleges and from scientists at the Illinois Natural History Survey. SIB and its member departments; the College of Liberal Arts and Sciences; the College of Agricultural, Consumer, and Environmental Sciences (ACES); and the Environmental Council generously provided resources toward research and training opportunities for students.

The program's faculty received "Top 10" rankings nationally and in its first seven years, over 50 outstanding students were recruited. Through 2007, the program graduated 18 Ph.D. and 11 M.S. students.

At its inception, PEEB was established as a "graduate option" for a biology degree. Although the University has a long tradition of excellence in graduate training in ecology and evolutionary biology, it had never offered graduate degrees in these fields. Moreover, our society has developed an increasing awareness of the significance of environmental and conservation issues—a trend leading to greater demand in public and private sectors for students with advanced degrees in ecology, evolution, and conservation biology.

To take maximum advantage of the breadth of faculty expertise and student interest, and recognizing that there is a seamless progression from ecology and evolution to contemporary issues in conservation biology, a new graduate degree-granting program that integrates these disciplines was established in 2007. The program in Ecology, Evolution, and Conservation Biology (PEEC) provides graduate

students with advanced conceptual, technical, and practical knowledge in ecology, evolution, and conservation biology, and prepares them for careers in academia, government, and private sectors. In addition to developing a high degree of proficiency in analytical and quantitative methods, students become thoroughly conversant with modes of inquiry and content of these disciplines. Because of the interdisciplinary nature of many issues in these areas, training and coursework are flexible and promote broad interdisciplinary interactions.

PEEC provides a visible interdisciplinary and conceptual home for graduate training in fields where expertise is dispersed across campus. Weekly seminars, workshops, annual student symposia, and faculty meetings promote the common objective of providing excellent graduate training.

Renewable energy

continued from p. 1

to pioneer research in the use of Miscanthus as a bioenergy crop. This grass is a front-runner in the effort to find an economical and environmentally friendly fuel source. Illinois will also work with its partners in EBI to explore the economic and environmental impact of the process—from farmland to fuel consumption. Understanding and reducing the environmental impacts of biofuel production will be a key focus.

“This will place us at the forefront of farm bioenergy production,” said Long. Long, who also has appointments at the National Center for Supercomputing Applications and the Institute for Genomic Biology, will lead the EBI initiative at Illinois as the deputy director. Laboratories and offices for the Illinois operation are in the new Institute for

Baling Miscanthus.

Genomic Biology facility on Gregory Drive in Urbana.

The research conducted by EBI is in five areas: feedstock development, biomass depolymerization (breaking down plant material for use in biofuels), fossil fuel bioprocessing (converting heavy hydrocarbons to cleaner fuels) and carbon sequestration (removing or preventing increases in atmospheric carbon), socioeconomic systems (social and economic issues related to these new technologies), and biofuels production. Discovery and development research centers at each site will support the scientific divisions.

In addition to feedstock development and socioeconomic research,

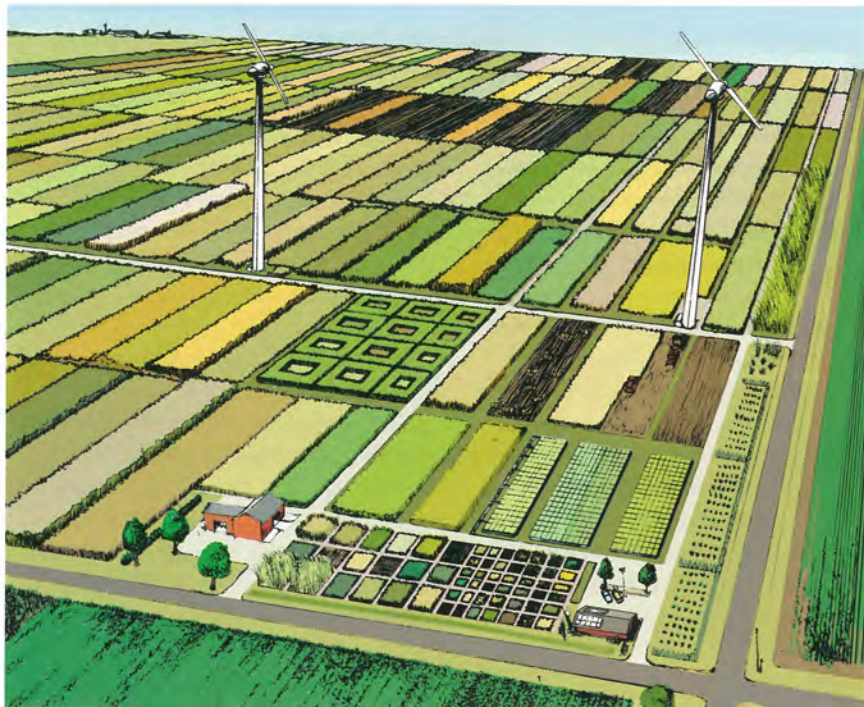


Illinois will work with the other research institutions on biofuels production. UC-Berkeley will lead this part of the project, with Illinois joining the search for the most efficient use of microbes to harvest the energy in plants for biofuels.

U of I Chancellor Richard Herman thanked BP for engaging the two universities in what he called a noble enterprise. “This exciting venture allows two of the country’s greatest public universities to work together to develop renewable energy—an initiative that will play a critical role in the success and security of our nation,” Herman said. “Addressing the problems facing society is the business of our institution. The scientists leading this important work are continuing Illinois’ rich heritage of paradigm-changing discovery and innovation.”

Reprinted with permission from the University of Illinois News Bureau. This article first appeared in *Inside Illinois* on February 1, 2007.

Artist’s rendering of 340-acre biosciences farm for the Urbana-Champaign campus proposed as part of the Energy Biosciences Institute. Image courtesy of S. Long.



Pittendrigh

Named Kearns, Metcalf, & Flint Endowed Chair in Entomology

The Department of Entomology and the School of Integrative Biology warmly welcome Dr. Barry Pittendrigh to the University of Illinois. He is the inaugural Chairholder of the C. W. Kearns, C. L. Metcalf and W. P. Flint Endowed Chair in Insect Toxicology in the Department of Entomology. It looks like his career will have its peak here, due to the generosity of Dr. Roy J. and Mary Lou Barker of Tucson, Arizona.

“I knew that I wanted a career in research,” said Roy Barker, who received his Ph.D. in Entomology from Illinois in 1953. He had a career of working in research labs for the USDA and industry, endeavoring to perpetuate the Department of Entomology’s legacy of research, teaching and mentoring. After “retiring” from the ASDA and lab work, he had a successful consulting business in biological control of insects, mainly in field work.

“I knew I wanted a career in academic research” said Dr. Barry Pittendrigh who began his entomological education at the University of Regina, in Saskatchewan, Canada. After receiving a MS in Entomology from Purdue University, he attended the University of Wisconsin, Madison for his PhD. He was a Max Planck Fellow in Germany, returning to Purdue in 2000 to begin his academic career.

The opportunity to become the Kearns, Metcalf and Flint endowed chairholder in Insect Toxicology attracted him to Illinois. “This opportunity at Illinois, will afford me the ability to provide my current and future Illinois students with the opportunity to pursue projects and creative ideas in entomology that would otherwise not be possible without such an endowment. I am extremely excited to be here at Illinois and very grateful to the Barkers for making this possible.”

“I have long admired the world-class research that has been conducted in the Department of Entomology here at the University of Illinois, and I feel very fortunate to have joined such an excellent group of people. The Barker’s exceptional gift will allow my laboratory team to work with some of the top people in the area of insect molecular biology and genomics. Additionally, I feel it is a great honor to have my laboratory’s name associated with such giants in entomology as Drs. Kearns, Metcalf, and Flint.”

Dr. Pittendrigh’s laboratory at Illinois will be focused on understanding how insects “resist” pesticides, and other challenges they face in their environment. “We are using what we learn from how insects deal with the world around them (at the molecular level) to determine the “Achilles’ heel” genes and proteins. These are genes and proteins that, when



inhibited, make the target insects susceptible to environmental stresses that they can otherwise withstand. From this knowledge, we hope to develop strategies to control insects (and their ability to become resistant to current control strategies) by targeting their natural defenses to the challenges that they normally experience in their environment.”

Again we welcome Dr. Barry Pittendrigh to the University of Illinois, and we say, “Thank You,” to Roy and Mary Lou Barker for their gift and their desire to see the Department of Entomology continue its legacy of excellence in research, teaching and service. They say, “Giving while living means knowing where it’s going.”

Where have all the honey bees gone?

Studying the cause of colony collapse disorder

by Reed Johnson

Honey bees are essential for the production of more than 90 food crops. But beginning in 2006, there was a drastic reduction in their numbers. What was happening to the honey bee colonies?

May R. Berenbaum and **Gene E. Robinson**, professors of Entomology, are using the results of the recent sequencing of the honey bee genome to find clues to help explain and prevent what is now termed “colony collapse disorder.”

In October 2006, Dave Hackenberg, a professional migratory beekeeper, took 400 colonies of honey bees from Pennsylvania to spend the winter in the warmth of central Florida. A month later, he found that many of the bees were gone. If hives were still inhabited, they contained only the queen and some younger bees. The older foraging bees, which specialize in gathering nectar and pollen, had disappeared. Only nine of those 400 colonies survived. In the months following this inexplicable loss, 23% of U.S. commercial beekeepers experienced similar losses, with affected operations losing an average of 45% of their colonies.

Beekeepers are accustomed to losing bees and colonies—bees may experience food shortages or die from exposure to extreme cold; they often suffer from viral, bacterial, and fungal infections, as well as attack by parasitic mites and exposure to insecticides.

However, these new losses were more serious and more sudden, and their cause more mysterious, leaving many beekeepers frightened for their livelihood.

Soon beekeepers, beekeeping organizations, and university and government researchers began to search for the cause of the collapse. A number of hypotheses have been advanced: new diseases, genetically modified crops, global warming, sunspot activity, and cell phones have been suggested as possible causes. Also a class of insecticides, similar to nicotine, has been suspected, because low doses of these compounds are known to alter honey bee behavior and might disrupt the sophisticated navigational system used by bees to find their way back to the hive after foraging.

Using methods originally developed for the identification of human pathogens, scientists have identified Israeli acute paralysis virus (IAPV) in the few bees remaining in colonies depopulated by colony collapse disorder. Although all collapsing colonies had IAPV, it is too soon to say that this virus is the sole cause of the disorder.

Australian bees also carry IAPV—in fact, Australian bees imported beginning in 2004 may well have introduced IAPV to the U.S.—but colony collapse disorder has never been observed in Australia. In Israel, IAPV infection causes a



suite of symptoms in bees, but it differs from the symptomatology of colony collapse disorder in the U.S.

Berenbaum and Robinson are using whole genome microarrays—“gene chips”—to compare gene expression in the guts of the bees remaining in collapsing colonies with those of bees collected prior to the introduction of IAPV. Since the gut is the principal site of detoxification in bees and other insects, exposure to toxins should be recorded in the genome in the form of changes in expression of detoxification genes in the gut.

Their labs also are comparing guts of American honey bees with the those of Israeli bees known to be infected with IAPV, but without the symptoms of colony collapse. Results of this research will help them look for differences in American bees that might connect IAPV infection to colony collapse disorder.

Personality plus?

Looking at reasons for differences in animal behavior

Are individual differences in behavior in animals the result of differences in their genetic blueprints, or are they due to differences in life experiences? This is the fundamental question asked by **Alison M. Bell**, assistant professor of Animal Biology. To investigate this question, Bell has chosen to study behavioral differences, or “animal personality,” in the threespined stickleback, a small freshwater fish found in northern rivers.

Studies have shown that some sticklebacks are quite aggressive while others are rather docile, even under the same circumstances. Such differences in behavior between different animals are puzzling from an evolutionary viewpoint. Ideally, individuals should be able to change their behavior according to the immediate circumstances, so that in a particular context all animals should behave quite similarly.

Consistent differences in behavior between different fish, even in similar circumstances, suggests that individuals may not be as behaviorally “plastic” as they should be—they might not be able to change their behavior as much as we thought.

After graduating with a B.A. from the University of Chicago, Bell embarked on her studies at the University of California, Davis. For her doctoral research, she followed the development of

behavioral similarities in sticklebacks from two different populations.

She found that in a population of sticklebacks frequently attacked by predators, individual differences in behavioral reactions to predators were genetically correlated with aggressiveness towards other sticklebacks. In other words, some sticklebacks reacted aggressively both to predators and to other sticklebacks.

However, in a population that was under little or no attack, aggressiveness against predators was not correlated with aggressiveness against other sticklebacks. Fish that were aggressive toward predators were not necessarily the same ones that were aggressive toward other sticklebacks.

These results suggested that the evolutionary selective pressure represented by predation might bring about a genetic tendency for aggressiveness that was independent of the object of the aggression. To test this hypothesis, Bell measured natural selection by predators on the aggressiveness of the fish and found that exposure to predators induces the behavioral aggressiveness against predators and other sticklebacks via both genetic and plastic responses.

In her postdoctoral work, carried out as an NSF Fellow at the University of Glasgow, and then as an American Association of



University Women Postdoctoral Fellow at UC-Davis, Bell measured two aspects of stress response—the release of cortisol, a stress hormone, and the turnover of monoamines in the brain. She found that individual differences in the stress response system of sticklebacks were related to individual differences in aggressive behavior, but that different behaviors were associated with different neurotransmitters. The next question is whether there is an underlying link between behaviors in populations that are under strong predation pressure, a link that is missing in low-predation populations.

Since joining the faculty in 2006, Bell has taken advantage of new genomic tools for sticklebacks, including a complete genome sequence, to dissect the genetic correlates of individual differences in behavior. For example, she is using quantitative trait locus (QTL) genetic mapping to identify regions of the genome that are associated with individual differences in boldness and aggressiveness. In addition, her lab is using whole-genome microarrays to identify differentially expressed genes between very bold and very timid individuals.

The environmental impact on ecosystem goods and services

How do plants respond in natural and agricultural ecosystems to global climate change and abiotic stress? How does the genome regulate plant ecological strategies? These are two questions addressed by **Andrew D.B. Leakey**, assistant professor of Plant Biology and the Institute for Genomic Biology. Combining molecular, biochemical, physiological, ecological, and modeling tools, he assesses plant performance in manipulative field experiments and in controlled environmental chambers. This research will enhance understanding how the environment today and in the future impacts ecosystem goods and services, including biodiversity, productivity, water cycling, and food supply.

An interest in linking information from multiple scales of biological organization to improve our understanding of mechanisms is reflected in two current projects funded by the U.S. Department of Energy's National Institute for Climate Change Research.

In collaboration with Tracy Twine, University of Minnesota, Leakey is using a dynamic global vegetation model, Agro-IBIS, to predict changes in carbon, water, and energy cycling by major U.S. agroecosystems as they respond to climate change. This research aims to evaluate for the first time the combined effects of changing

carbon dioxide concentration, ozone concentration, temperature, and precipitation on agroecosystems. The modeling will be combined with data from experiments investigating the physiological mechanism of soybean, maize, and wheat responses to climate change using Free-Air Concentration Enrichment facilities. FACE is a method of growing plants under simulations of future conditions in the field, without using chambers or greenhouses, and therefore provides the best tests of future crop performance.

The second project is based at the Illinois' SoyFACE facility. Planted in 60 million hectares, the soybean-maize agroecosystem is the largest single ecosystem type in the continuous 48 states and dominates the Midwest. These two crops use different types of photosynthesis—the soybean is a C₃ plant and maize is a C₄ plant.

Leakey's previous research demonstrated that, while elevated carbon dioxide concentrations directly stimulate photosynthesis in soybeans, and therefore its growth and yield, the same is not true for maize. Growing at elevated carbon dioxide concentrations reduces only the water use of maize, which can help reduce drought stress.

He is now investigating under field conditions the ecological and physiological mechanisms of



soybean and maize responses to the greater incidence of drought and elevated carbon dioxide concentrations expected to occur in 2050.

He will also use microarrays and metabolomics to broadly screen the molecular and biochemical responses of soybeans to elevated carbon dioxide concentrations and drought. New mechanistic information is emerging, including increased gene expression for components of respiratory metabolism. Increased respiratory metabolism supports greater energy production and greater synthesis of sugars and amino acids, which allow the plant to osmoregulate better.

Before joining the faculty in August 2007, Leakey was a Fulbright Scholar and a postdoctoral associate at Illinois. He earned his Ph.D. from the University of Sheffield, U.K., in 2002 for work on the ecophysiology of tropical rain forest tree seedlings.

Does form follow function?

Discovering how developmental mechanisms drive morphologic diversification



Karen E. Sears, assistant professor of Animal Biology and the Institute for Genomic Biology, is interested in the developmental mechanisms that drive morphologic diversification. She combines traditional embryological and paleontological approaches with modern developmental genetic and morphometric techniques to gather data from fossil and living mammals.

Historically, our understanding of patterns of morphologic evolution has come from the comparative anatomical study of living organisms and those preserved as fossils. By applying data from additional sources, such as developmental genetics, to the study of morphologic evolution, she is able to go a step further and examine the processes responsible for these patterns. This allows Sears to address large-scale questions such as: How do developmental

changes lead to morphologic innovations? How do developmental mechanisms bias the direction of morphologic evolution? How do different genetic mechanisms contribute to morphologic evolution?

A fundamental component of

Sears' research is expanding what she learns from model organisms into a comparative approach incorporating non-model organisms. Mammals are an ideal group to study evolution and development because they not only possess a great variety of developmental modes, adult morphologies, and a good fossil record, but also include one of the best-studied model organisms, the mouse.

In addition to the mouse, Sears uses a variety of species in her study of development, including bats, kangaroos, possums, artiodactyls, and moles. With this comparative approach, Sears has made several discoveries. The evolution of marsupial mammals (kangaroos, possums, and their kin) has been constrained relative to that of their eutherian cousins (humans, bats, whales, cows, etc.)

because of their mode of reproduction. And changes in a few key genes might be responsible for the rapid evolution of flight in bats.

Since coming to Illinois in October 2007, Sears continues innovative research into marsupial and bat evolution and development. In addition, she is collaborating with several Illinois scientists to study topics ranging from the developmental mechanisms behind the evolutionary reduction of mammalian digits to the genetic architecture of mammalian limbs to mammalian digit regeneration.

Sears also maintains her interest in paleontology and is currently working on a series of projects involving developmental and evolutionary mechanisms responsible for the evolutionary transition from a "reptilian" to a "mammalian" morphology that occurred gradually over a 100-million-year time span, from about 300 to 200 million years ago.

Sears earned her Ph.D. from the University of Chicago's Committee on Evolutionary Biology in 2003. She conducted postdoctoral research in the lab of Lee Niswander, a leader in the field of developmental biology, at Memorial Sloan Kettering Cancer Center, Manhattan, New York, and the University of Colorado Health Sciences Center, Denver.

SIB Enhancement Awards for 2007-2008

made possible through the generous gifts
of alumni and friends to the SIB Annual Fund

Silvia Remolina, doctoral student in Animal Biology—to present poster at *Biology of Ageing* Symposium in Saltsjöbaden, Sweden

Tim O'Connor, undergraduate in Integrative Biology, **Bill Wills**, doctoral student in Animal Biology, **Shelly Gareiss**, undergraduate in Integrative Biology, **Brad Cosentino**, **Claire Baldeck**, **Catherine Bechtoldt**, **Elena Lobo**, doctoral students in PEEC, and **Katherine Chi**, doctoral student in Plant Biology—to participate in Organization for Tropical Studies (OTS) Study Abroad Program courses, Costa Rica

Zachary Johnson and **Michelle Harris**, undergraduates in IB Honors—to attend marine biology course in Curaçao

Neeraj Ajoshi, undergraduate in IB Honors—to support undergraduate internship in Geneva, Switzerland

Caroline Nalezny, undergraduate in Integrative Biology—to participate in a summer course in South Africa

Erik Connelly, undergraduate in IB Honors—to participate in an ecology project in Taiwan

Derek Meyer and **Norah Prior**, undergraduates in Integrative Biology—to support research in Uganda

Josephine Chambers, undergraduate in IB Honors, and **Josephine Rodriguez**, doctoral student in Entomology—to support field research in Costa Rica

Pamela Ziolkowski, undergraduate in Integrative Biology—to attend study tour to South Africa

Emilie Bess, doctoral student in PEEC—to attend Applied Phylogenetics Workshop, Bodega Bay Marine Research Facility, Bodega Bay, CA

Clare Casteel, doctoral student in Plant Biology—to present invited paper at the International Congress of Entomology, Durban, South Africa

George Hickman, doctoral student in Plant Biology—to attend Flux and Modeling Course in Colorado

Kate Loskowski, doctoral student in Animal Biology—to attend Stickleback Molecular Short Course, Stanford University

Merla Hubler, undergraduate in IB Honors—to support volunteer work with Proworld Service Corps, Cuzco, Peru

Thanks to the School of Integrative Biology Enhancement Fund, in September 2007 I was able to attend the 4th Key Symposium *Biology of Ageing*, in Saltsjöbaden, Sweden. The Key Symposium is hosted by the *Journal of Internal Medicine* and the Royal Swedish Academy of Sciences in honor of Professor Axel Key, a member of the Swedish Academy of Sciences and chairman of the Karolinska Institute in the 19th century. I was invited to present a poster at this meeting entitled, “Caste specific aging differences in the honey bee, *Apis mellifera*,” which received a good deal of attention. I had the opportunity to interact with leading scientists in the field of aging and listen to a broad spectrum of talks, encompassing such themes as the effects of caloric restriction in lifespan; the role of oxidative stress, reactive oxygen species, and mitochondrial dysfunction in aging; aging in natural populations; aging at the cellular level; diseases of aging; telomeres, telomere length, and longevity; and insulin signaling and its role in lifespan determination.

In addition to learning about the recent advances in the field, the trip was also a good opportunity to learn about the educational system in other countries with respect to obtaining a doctoral degree and pursuing academic opportunities in Europe. The symposium organizers were very kind in planning a trip to

Stockholm, where we had the opportunity to visit the Nobel Museum and learn the history of Alfred Nobel and the Nobel Prize. We also visited the Vasa Museum, home of a restored royal warship that sank in 1628. This was a good chance to learn about the history of Sweden and the day-to-day life of Vikings.

I would like to thank the School director, the Animal Biology department head, my advisors, and of course the generous donors to the Enhancement Fund, for this phenomenal academic and cultural experience.

—Silvia Remolina

2008 School of Integrative Biology Student Awards

Undergraduate Student Awards

Integrative Biology Distinction Award: Daniel R. Scholes

Helen E. Hess Award: Katerina Starostin

Harriett Long Award: Derek J. Meyer

Undergraduate Entomology Research Award: Allison C. Mooney

Integrative Biology Open House Poster Awards. 1st Place: Neeraj N. Joshi; *2nd Place:* Zachary V. Johnson

Procter and Gamble Company Undergraduate Student Research Award: Daniel R. Scholes

Graduate Student Awards

Robert Emerson Memorial Grant: Heather M. Hines (Entomology), Victoria E. Wittig (Plant Biology)

Francis M. and Harlie M. Clark Summer Grant: Corey E. Tarwater (Ecology, Evolution, and Conservation Biology)

Francis M. and Harlie M. Clark Research Support Grant: Devi Annamalai (Plant Biology), Michael R. Allen (Ecology, Evolution, and Conservation Biology), Cassandra M. Allsup (Ecology, Evolution, and Conservation Biology), Kelly M. Andersen (Ecology, Evolution, and Conservation Biology), Claire A. Baldeck (Ecology, Evolution, and Conservation Biology), Moni C. Berg-Binder (Animal Biology), Kevin Bilyk (Animal Biology), Katherine Chi (Plant Biology), Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology), Jenny M. Cordes (Plant Biology), Clark A. Danderson (Plant Biology), Mary Ann Feist (Plant Biology), Indrajit Kumar (Physiological and Molecular Plant Biology), Elena Lobo (Ecology, Evolution, and Conservation Biology), Molly B. McNicoll (Plant Biology), Ann Marie Ray (Entomology), Silvia C. Remolina (Animal Biology), Matthew L. Richardson (Ecology, Evolution, and Conservation Biology), Josephine J. Rodriguez (Entomology), Eric R. Scott (Ecology, Evolution, and Conservation Biology), Madhura H. Siddappaji (Animal Biology), Sigrid D.P. Smith (Ecology, Evolution, and Conservation Biology), Pimonrat Tiansawat (Plant Biology)

John G. & Evelyn Hartman Heiligenstein Outstanding Teaching Assistants. Integrative Biology Introductory Biology Courses: Carolyn M. Barrett (Ecology, Evolution, and Conservation Biology); *Integrative Biology Core Courses for IB Majors:* Jinelle Hutchins Sperry (Ecology, Evolution, and Conservation Biology); *Integrative Biology Honors Concentration Courses:* Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology)

Animal Biology Summer Stipend Awards: Emma L. Berdan, Jennifer M. Duggan, Ashley M. Johnson

Edwin M. Banks Memorial Award: Kate L. Laskowski (Animal Biology)

Odum-Kendeigh Research Awards: James E. Peters (Animal Biology), Madhura H. Siddappaji (Animal Biology), Daniel P. Welsh (Animal Biology), Bill D. Wills (Animal Biology), Xuan Zhuang (Animal Biology)

Ellis MacLeod/DuPont Award for Outstanding Teaching by a Graduate Student in the Department of Entomology: Elizabeth E. Graham

Herbert Holdsworth Ross Memorial Fund Award: Clark A. Danderson (Plant Biology), Ann Marie Ray (Entomology), Scott M. Shreve (Entomology)

Philip W. Smith Memorial Fund Award: Jeffrey D. Lozier (Entomology)

Govindjee and Rajni Govindjee Award for Excellence in Biological Research: Kelly M. Andersen (Ecology, Evolution, and Conservation Biology), Cecile M. Sano (Plant Biology)

Harold C. and Sonja L. Labinsky Award: Devi Annamalai (Plant Biology), Clark A. Danderson (Plant Biology)

John R. Laughnan Award: Mary Ann Feist (Plant Biology), George C. Hickman (Plant Biology), Justin M. McGrath (Plant Biology), Victoria E. Wittig (Plant Biology)

Award for Outstanding Teaching in Plant Biology: Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology), Victoria E. Wittig (Plant Biology)

Program in Ecology, Evolution, and Conservation Biology Summer Research Grant: Cassandra M. Allsup, Kelly M. Andersen, Claire A. Baldeck, Carolyn M. Barrett, Catherine L. Bechtoldt, Bradley J. Cosentino, Nicole M. Davros, Brielle J. Fischman, Ian P. Kirwan, Elena Lobo, Ariane L. Peralta, Anne M. Readell, Matthew L. Richardson, Eric R. Scott, Sigrid D.P. Smith, Corey E. Tarwater

Program in Ecology, Evolution, and Conservation Biology Travel Grant: Michael R. Allen, Cassandra M. Allsup, Kelly M. Andersen, Douglas G. Barron, Catherine L. Bechtoldt, Michael P. Carey, Ian P. Kirwin, J. Dylan Maddox, Ariane L. Peralta, Matthew L. Richardson, Sigrid D.P. Smith, Jinelle Hutchins Sperry, Corey E. Tarwater

Graduate Students in Ecology, Evolution, and Conservation Biology Symposium Awards. Best Overall: John E. Drake (Ecology, Evolution, and Conservation Biology); *Best Talk by a Ph.D. Candidate:* Kelly M. Andersen (Ecology, Evolution, and Conservation Biology); *Best Talk by a Masters/Early Ph.D. Student:* Bradley J. Cosentino (Ecology, Evolution, and Conservation Biology)

Herbert Holdsworth Ross Memorial Fund Award: Clark A. Danderson (Plant Biology), Ann Marie Ray (Entomology), Scott M. Shreve (Entomology)

Philip W. Smith Memorial Fund Award: Jeffrey D. Lozier (Entomology)

Govindjee and Rajni Govindjee Award for Excellence in Biological Research: Kelly M. Andersen (Ecology, Evolution, and Conservation Biology), Cecile M. Sano (Plant Biology)

Harold C. and Sonja L. Labinsky Award: Devi Annamalai (Plant Biology), Clark A. Danderson (Plant Biology)

John R. Laughnan Award: Mary Ann Feist (Plant Biology), George C. Hickman (Plant Biology), Justin M. McGrath (Plant Biology), Victoria E. Wittig (Plant Biology)

Award for Outstanding Teaching in Plant Biology: Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology), Victoria E. Wittig (Plant Biology)

Program in Ecology, Evolution, and Conservation Biology Summer Research Grant: Cassandra M. Allsup, Kelly M. Andersen, Claire A. Baldeck, Carolyn M. Barrett, Catherine L. Bechtoldt, Bradley J. Cosentino, Nicole M. Davros, Brielle J. Fischman, Ian P. Kirwan, Elena Lobo, Ariane L. Peralta, Anne M. Readell, Matthew L. Richardson, Eric R. Scott, Sigrid D.P. Smith, Corey E. Tarwater

Program in Ecology, Evolution, and Conservation Biology Travel Grant: Michael R. Allen, Cassandra M. Allsup, Kelly M. Andersen, Douglas G. Barron, Catherine L. Bechtoldt, Michael P. Carey, Ian P. Kirwin, J. Dylan Maddox, Ariane L. Peralta, Matthew L. Richardson, Sigrid D.P. Smith, Jinelle Hutchins Sperry, Corey E. Tarwater

Graduate Students in Ecology, Evolution, and Conservation Biology Symposium Awards. Best Overall: John E. Drake (Ecology, Evolution, and Conservation Biology); *Best Talk by a Ph.D. Candidate:* Kelly M. Andersen (Ecology, Evolution, and Conservation Biology); *Best Talk by a Masters/Early Ph.D. Student:* Bradley J. Cosentino (Ecology, Evolution, and Conservation Biology)

Herbert Holdsworth Ross Memorial Fund Award: Clark A. Danderson (Plant Biology), Ann Marie Ray (Entomology), Scott M. Shreve (Entomology)

Philip W. Smith Memorial Fund Award: Jeffrey D. Lozier (Entomology)

Govindjee and Rajni Govindjee Award for Excellence in Biological Research: Kelly M. Andersen (Ecology, Evolution, and Conservation Biology), Cecile M. Sano (Plant Biology)

Harold C. and Sonja L. Labinsky Award: Devi Annamalai (Plant Biology), Clark A. Danderson (Plant Biology)

John R. Laughnan Award: Mary Ann Feist (Plant Biology), George C. Hickman (Plant Biology), Justin M. McGrath (Plant Biology), Victoria E. Wittig (Plant Biology)

Award for Outstanding Teaching in Plant Biology: Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology), Victoria E. Wittig (Plant Biology)

Program in Ecology, Evolution, and Conservation Biology Summer Research Grant: Cassandra M. Allsup, Kelly M. Andersen, Claire A. Baldeck, Carolyn M. Barrett, Catherine L. Bechtoldt, Bradley J. Cosentino, Nicole M. Davros, Brielle J. Fischman, Ian P. Kirwan, Elena Lobo, Ariane L. Peralta, Anne M. Readell, Matthew L. Richardson, Eric R. Scott, Sigrid D.P. Smith, Corey E. Tarwater

Program in Ecology, Evolution, and Conservation Biology Travel Grant: Michael R. Allen, Cassandra M. Allsup, Kelly M. Andersen, Douglas G. Barron, Catherine L. Bechtoldt, Michael P. Carey, Ian P. Kirwin, J. Dylan Maddox, Ariane L. Peralta, Matthew L. Richardson, Sigrid D.P. Smith, Jinelle Hutchins Sperry, Corey E. Tarwater

Graduate Students in Ecology, Evolution, and Conservation Biology Symposium Awards. Best Overall: John E. Drake (Ecology, Evolution, and Conservation Biology); *Best Talk by a Ph.D. Candidate:* Kelly M. Andersen (Ecology, Evolution, and Conservation Biology); *Best Talk by a Masters/Early Ph.D. Student:* Bradley J. Cosentino (Ecology, Evolution, and Conservation Biology)

Herbert Holdsworth Ross Memorial Fund Award: Clark A. Danderson (Plant Biology), Ann Marie Ray (Entomology), Scott M. Shreve (Entomology)

Philip W. Smith Memorial Fund Award: Jeffrey D. Lozier (Entomology)

Govindjee and Rajni Govindjee Award for Excellence in Biological Research: Kelly M. Andersen (Ecology, Evolution, and Conservation Biology), Cecile M. Sano (Plant Biology)

Harold C. and Sonja L. Labinsky Award: Devi Annamalai (Plant Biology), Clark A. Danderson (Plant Biology)

John R. Laughnan Award: Mary Ann Feist (Plant Biology), George C. Hickman (Plant Biology), Justin M. McGrath (Plant Biology), Victoria E. Wittig (Plant Biology)

Award for Outstanding Teaching in Plant Biology: Benjamin F. Clegg (Ecology, Evolution, and Conservation Biology), Victoria E. Wittig (Plant Biology)

Program in Ecology, Evolution, and Conservation Biology Summer Research Grant: Cassandra M. Allsup, Kelly M. Andersen, Claire A. Baldeck, Carolyn M. Barrett, Catherine L. Bechtoldt, Bradley J. Cosentino, Nicole M. Davros, Brielle J. Fischman, Ian P. Kirwan, Elena Lobo, Ariane L. Peralta, Anne M. Readell, Matthew L. Richardson, Eric R. Scott, Sigrid D.P. Smith, Corey E. Tarwater

Program in Ecology, Evolution, and Conservation Biology Travel Grant: Michael R. Allen, Cassandra M. Allsup, Kelly M. Andersen, Douglas G. Barron, Catherine L. Bechtoldt, Michael P. Carey, Ian P. Kirwin, J. Dylan Maddox, Ariane L. Peralta, Matthew L. Richardson, Sigrid D.P. Smith, Jinelle Hutchins Sperry, Corey E. Tarwater

Graduate Students in Ecology, Evolution, and Conservation Biology Symposium Awards. Best Overall: John E. Drake (Ecology, Evolution, and Conservation Biology); *Best Talk by a Ph.D. Candidate:* Kelly M. Andersen (Ecology, Evolution, and Conservation Biology); *Best Talk by a Masters/Early Ph.D. Student:* Bradley J. Cosentino (Ecology, Evolution, and Conservation Biology)

Please keep in touch...

Please let us know about your news, achievements, honors, career, etc. Also, include your degree, department or program, and year. Mail your news to Alumni News, School of Integrative Biology, University of Illinois, 286 Morrill Hall, 505 S. Goodwin Ave., Urbana, IL 61801; fax it to 217/ 244-1224; or email thelton@life.illinois.edu. We look forward to hearing from you.

Alumni

Jason A. Cohan (B.S. Teaching of Biology 1997) is a training specialist at Abbott Labs Pharmaceutical Research and Development in Lake County, Illinois. Jason lives in Lake County with his wife, Amy (B.S. Psychology 1996), and their beagle, Nikolas. He is also involved in science education outreach programs. He serves as a special awards judge at the Illinois Junior Academy of Sciences, North Suburban Regional project session, and served as a judge for the 2006 sanofi-aventis International BioGENEius Challenge at the BIO 2006 convention in Chicago.

Wayne H. Davis (M.S. 1955 and Ph.D. Zoology 1957) is a professor emeritus of Biology, University of Kentucky. He has authored three books, *Bats of America*, *Mammals of Kentucky*, and *Bluebirds and Their Survival*, all published by the University Press of Kentucky. Since retiring in 1993, Davis has been studying nest site requirements of bluebirds, house sparrows, and Carolina wrens.

Deaths

Helen E. Hess, 76, former assistant director of the School of Life Sciences, died April 2, 2007. She retired in 1991 after 31 years of service. Hess received a B.S. in Teaching of English from the University of Illinois in 1953 and her Ed.M. in education in 1966, also

from the U of I. She was preceded in death by one brother. She is survived by her sister, Nancy Long, Hoopeston, and several nephews and nieces.

Fakhri Bazzaz, 74, died February 6, 2008. Bazzaz earned his Ph.D. in Plant Biology at the University of Illinois in 1963 and went on to join the faculty of Plant Biology, later becoming department head and then acting director of the School of Life Sciences. He moved to Harvard University as Mallinckrodt Professor of Biology. An ecologist, Bazzaz was broadly interested in how plants adapt to natural and anthropogenic disturbances. He was among the first ecologists to recognize not only the spectre but also the complexities of rising atmospheric carbon dioxide and the threat it represents to the human population and the ecosystems upon which we depend. He was a renowned and beloved teacher and trained a generation of young scientists now at the leading edge of physiological, population, and community ecology. The author of eighteen invited chapters, six books and almost 300 publications, Bazzaz was awarded the College of Liberal Arts and Sciences' Alumni Achievement Award in 2003.

Gary Spezia advising an undergraduate student.

Staff

Jana Waite, assistant to the director, School of Integrative Biology, retired September 30, 2006, with 16 years of service at the U of I. Waite began her career at the University as assistant to the director of the School of Life Sciences. She worked throughout the reorganization of the School of Life Sciences and the establishment of the School of Integrative Biology. Before coming to the University she worked for 14 years in the Center for Aquatic Ecology, Illinois Natural History Survey.

Gary Spezia was awarded both the College of Liberal Arts and Sciences' and the Campus Award for Excellence in Advising Undergraduate Students this year. Spezia has been an advisor for 16 years, including eight years in biology.



A note from Dr. David Lincicome

I was a tutorial student in Zoology back in the 1930s. In 1934 I was taken out of most classes and put in a laboratory under a tutor. My assignment was to study the parasites of chickens, which I did. A friend asked me to accompany him to upper Wisconsin and Michigan to study fishes, but I declined as I had to earn enough money to pay my tuition. The friend then sent me two barrels of fish intestines packed in ice, and I spent the next two years studying the parasites of these fishes unbeknownst to my tutor. At the end of four years I submitted a manuscript describing the work on chicken parasites and a manuscript describing my study of fish parasites. My tutor then went to the dean of the Graduate School and recommended that I be awarded a Master's degree. The result was both B.S. and M.S. degrees in 1937.

During this period I also became interested in the group of parasites known as Acanthocephala. I was intrigued with the brain of these organisms, but a search of the scientific literature for information on the form and function of this organ yielded nothing. During this time I became impressed by the lack of experimental work in either the biochemistry or physiology of these organisms. As preparation for experimental work to come later in life, I took courses in biochemistry and chemistry.

Upon graduating from Illinois I accepted a teaching position at Tulane University Medical School, where I joined the Department of Tropical Medicine under the direction of Ernest Carroll Faust, who was an Illinois graduate with a doctorate under the direction of Henry Baldwin Ward, head of Zoology. There I pursued experimental work on the

cyclicality of elimination of the cysts of *Entamoeba histolytica*, the etiologic agent of amebiasis, which led to work on the periodic deposit of eggs of *Enterobius vermicularis*. The technique developed for diagnosis of this nematode is still in use today.

In the mid 1940s I gradually became aware that the field of parasitology was mostly descriptive. Something had to be done to develop biochemical and physiological work in the field. To this end, I pounded the streets of New York in search of scientific publishers who would listen to me. Fortunately, Kurt Jacoby of the Academic Press listened. I proposed to launch a scientific journal to be called *Experimental Parasitology (EP)* to provide a medium to encourage biochemical and physiological studies of parasites, the etiologic agents of some of the world's worst diseases. The first issue of this journal appeared October 1951. As of September 2007, volume 117 (No. 1) was printed. I edited the first 37 volumes of this journal.

After *EP* was launched, I recommended to Jacoby that a journal devoted to virology be published. His first reaction was to include virology in *EP*. I objected for I felt that the fields were different. Although Jacoby wanted me to edit the new journal *Virology*, I felt I was too involved in *EP* to do it justice. I did agree to set up its first editorial board. *Virology* has certainly met all my expectations. The first issue appeared in May 1955; as of October 25, 2007, volume 367 (No. 2) was published. Elsevier Company now publishes both journals.

The University's new Institute of Genomic Biology's theme on host-microbe systems struck me as very

similar to the experimental work I have done over many years, defining metabolic relationships and molecular exchanges between the rat and its trypanosome, *Trypanosoma lewisi*. I wonder whether those working in this theme are aware of this work. There are some remarkable interactions metabolically.

I have also been deeply involved in genetic conservation and have a series of papers published on dogs and sheep. As a result of this work, the American Livestock Breeds Conservancy awarded me its 2003 Genetic Conservation Award.

For the past three months I have spent several hours every day translating a manual from German into English. It is for the antique German tractor called the Bulldog, which the Diebold Foundation in Roxbury acquired for its Museum of Antique Tractors. My education has greatly expanded during this time!

In addition to this translational work I continue to teach a class in German on Saturdays at the Roxbury Senior Center, and on Wednesdays I spend the day giving individual lessons to piano students ranging in age from 68 to 91. And all are doing well.

With warm regards, I am

Sincerely,

David Richard Lincicome, Ph.D.,
BADM, DACAP, PAS

DeLucia named School director and Arends Professor



Evan DeLucia, professor of Plant Biology, has been named the School of Integrative Biology's second director. His appointment is effective October 1, following the retirement of Fred Delcomyn. DeLucia was the founding director of the Program in Ecology and Evolutionary Biology and currently is head of Plant Biology. After completing his B.A. at Bennington College, DeLucia completed an M.F.S. (1982) in forest ecology at Yale University and a Ph.D. (1986) in plant ecology and physiology at Duke University. He joined the faculty at Illinois in 1986, where he was recognized as a University Scholar in 1997. In 1994, DeLucia was a Bullard Fellow at Harvard University and in 2002 he was a Fulbright Fellow at Landcare Research in New Zealand. DeLucia is a member of the American Association of Plant Physiologists, the International Union of Forest Research Organizations, the Ecological Society of America, and an American Association for the Advancement of Science Fellow. He was elected Chair of the Physiological Ecology Section of the Ecological Society (1996-1998). He provides editorial services for several prominent journals, including *Ecology*, *Oecologia*, *Tree Physiology*, and *Global Change Biology*.

DeLucia studies the physiological ecology of vascular plants with an emphasis on environmental limitations to photosynthesis and resource allocation. He is interested in developing integrated models of light utilization by plants in different habitats, with an emphasis on woody plants. Over the last several years, a main thrust of his research has been to determine how elevated atmospheric carbon dioxide influences physiological processes and carbon fluxes in forest ecosystems. His laboratory provided the first estimate of the direct effect of elevated carbon dioxide on forest productivity and the ability of forests to sequester atmospheric carbon. His students are also exploring the potential influences of global change on plant-insect interactions and the effects of non-native species on ecosystem function.

DeLucia has also been named the G. William Arends Professor in Integrative Biology for his research achievements and extraordinary service to the University. G. William and Clair Mae Arends were generous supporters of the the University; contributing to WILL, Krannert Center for the Performing Arts, the College of Medicine, and the School of Life Sciences (currently the Schools of Integrative Biology and Molecular and Cellular Biology). Dr. Arends served in the Air Force during WWII, practiced medicine in Taylorville from 1949-1979, and served as a consultant for the Illinois Department of Public Aid and the Illinois Humanities Council beginning in 1979. He and Mrs. Arends were married in 1939, and she was a nurse in his office for 18 years. Dr. Arends died in 1997, and Mrs. Arends in 2000. The School is grateful to the Arends for their charitable trust that makes this professorship possible. DeLucia is the second Arends Professor, succeeding Gene E. Robinson.



School of Integrative Biology
University of Illinois at Urbana-Champaign
286 Morrill Hall, 505 S. Goodwin Ave.
Urbana, IL 61801

Non-profit Organization
U.S. Postage Paid
Permit No. 245
Champaign, IL 61820