Northern Illinois University • Department of Biological Sciences • 11th Annual Newsletter • Fall 2006

Professor J. Michael Parrish

In July, I bade a fond farewell to the Department of Biological Sciences and to Northern Illinois University as I moved to California to become dean of the College of Science at San José State University. I am very excited about the opportunities and challenges that the new position will provide, and am also looking forward to returning to my own roots in the Santa Clara Valley, as I grew up in nearby Palo Alto.

The department is being left in good hands, as Carl von Ende has graciously agreed to become acting chair, after serving in the role of director of graduate studies for a decade. I am confident that Carl's strong administrative, interpersonal, and academic skills will serve the department very well.

This summer, Raymond Alden became Northern Illinois University's executive vice president and provost. Professor Alden, who is a marine biologist, comes to Northern after serving in a similar position at the University of Nevada at Las Vegas. We are happy to welcome Professor Alden to the university, and to the department, where he has an appointment as a tenured full professor.

Looking towards the future, the department will be undergoing a process of strategic planning, to build on its many strengths, to assess how best to serve the needs of current and future students, and to train the biologists of the future. In closing, I would like to thank all of you for the roles you have played in making the Department of Biological Sciences such a stimulating place for learning about the earth's biota. I have enjoyed my 18 years at Northern, and will miss colleagues, friends, and students I have known here over the years.

Inside:

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Professor Carl von Ende

The announcement in June as the 2005-2006 academic year was wrapping up that Mike Parrish would be moving to San Jose State University required some quick adjustments by the college and the department, but also foreshadowed changes that will be occurring at the college and department over the next several years. Our new provost will be selecting a new dean of the College of Liberal Arts and Sciences during this next academic year. That new dean, in consultation with the department, will appoint a new chair of the department the following year. I will be the acting chair during this two-year interim. Fortunately, the responsibilities are not totally foreign to me, since I had to deal with aspects of them when graduate adviser. But daily I am learning new things about academic and administrative procedures on campus.

The department certainly appreciates Mike's efforts as chair over the past seven years, especially in increasing the exposure of the department both on and off campus. He was particularly effective in fostering interaction on campus with other departments, such as anthropology, geography, and geology. Professors Daniel Gebo (anthropology), Lesley Rigg (geography), and Reed Scherer and Melissa Lenczewski (geology) now have joint appointments in the Department of Biological Sciences, as well as in their home departments. Joint appointments increase the potential for collaboration by our faculty and provide opportunities for the training of graduate students whose research interests are interdisciplinary and fall at the edges of traditional departmental research boundaries. Our own John Mitchell has had a joint apointment in chemistry since 1976. Off-campus, Mike has promoted the continued association of the university with the Burpee Museum of Natural History in Rockford. He was instrumental in organizing a tyrannosaur symposium this past September at the Burpee Museum, cosponsored by the College of LA&S and the museum. About 30 specialists on *Tyrannosorus rex* from the U.S., Canada, Europe and Asia participated in the symposium. The department will continue to work to sustain and expand such collaborations in the future.

A goal during this interim period will be to conduct a department review, and to reflect on the undergraduate and graduate curriculum and training programs, in light of current and future goals and challenges in preparing students for careers in the biological sciences. The department expects to add several new faculty members in the near future to replace departed and retired former colleagues. This review will aid the department in identifying the research and teaching specializations for these new positions. ♦

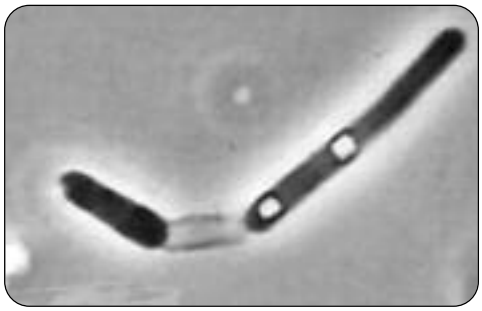
Grant funds Genetic sequencing of B. megaterium

by Professor Patricia Vary

Four students and six faculty from the Department of Biological Sciences at NIU went to The Institute for Genomic Research (TIGR—pronounced tiger) in Rockville, Maryland, May 14-17, 2006, to attend an intense two-day workshop on how to use the TIGR software programs to analyze the sequence of the bacterium *Bacillus megaterium*. The travel and workshop were financed by the $630,000 grant between Professor Patricia S. Vary of NIU and Dr. Jacques Ravel at TIGR. Faculty attending were Professor Vary (co-PI on the grant, whose laboratory has developed the genetics for *B. megaterium*), faculty members Mel Duvall, Michael Hudspeth, Rick Johns (co-director of the department's bioinformatics program), Shengde Zhou and Scott Grayburn (director of the department's sequencing facility). Also attending were bioinformatics students Chuck Leseberg, Sandhya Balasubramanian, Janaka Edirisinghe, and postdoctoral fellow Yamini Ranganathan. The preliminary sequencing of the more than 5 million bases has been completed at TIGR. Analysis of the sequence will be done mainly at NIU over the next year. Analysis will include assigning possible functions to approximately 5,000 genes. TIGR will be installing both the sequence and the software programs here at NIU. *B. megaterium* is a harmless soil bacterium, but related to *B. anthracis*, the cause of anthrax. A workshop is planned to train several other students and faculty at NIU this fall. In the second year of the grant, a workshop on genomics is planned for high school students and community college students in the area. A website will soon be available (www.bios.niu.edu/b_megaterium) so that those interested can follow the progress of the genome sequencing. ♦

left to right: Chuck Leseberg, Janaka Edirisinghe, Rick Johns, Pat Vary, Jacques Ravel, Yamini Ranganathan, Scott Grayburn, Sandhya Balasubramanian, Michael Hudspeth, Shengde Zhou, and Mel Duvall.

B. megaterium is an excellent expression host.



Above are cells carrying a potent insecticidal toxin gene from *B. thuringiensis* cloned into a *B. megaterium* vector derived from one of its plasmids.

There's a new face in the Greenhouse

by Chuck Faivre

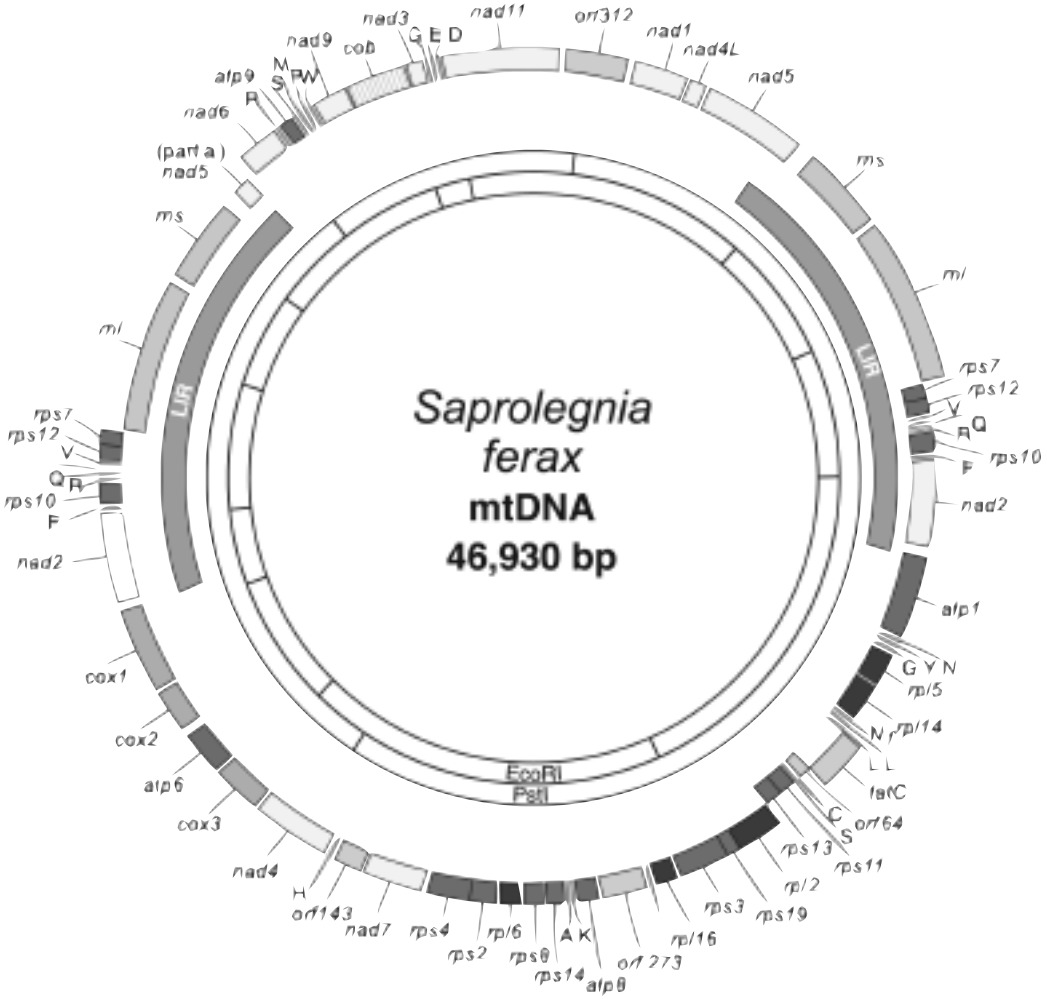
The plant sciences section is pleased to welcome Tammy Wilkerson to the greenhouse staff. Tammy joined our facility on January 9th. She is a recent graduate of Kishwaukee College's Horticulture Department and was employed in their greenhouse part time for the past year. This is not Tammy's first experience as an NIU employee. Prior to attending Kishwaukee, Tammy served for 10 years as a cook for NIU's Food Service department. Tammy's lifelong interest in anything to do with plants was not to be denied and she returned to school to earn her associate's degree in horticulture. ♦

Hudspeths' grant to sequence genomes

Joint Genome Institute Press Release

Deborah and Michael Hudspeth's project for DNA sequencing of 26 peronosporomycete mitochondrial genomes has been included in the Department of Energy Joint Genome Institute (DOE JGI) calendar for 2007. The project calls for the sequencing of ~1.5 X 10^6 nucleotides. A full listing of world-wide laboratories included in the calendar can be found at www.jgi.doe.gov/sequencing/cspseqplans2007.html.

The Web page includes the following from the link at www.jgi.doe.gov/sequencing/why/CSP2007/peronosporomycetes.html.



Why Sequence Peronosporomycetes?

This project entails the sequencing of 26 individual mitochondrial genomes that reflect the diversity inherent in the Peronosporomycetes, an economically important group of lower eukaryotes traditionally referred to as oomycetes. These "protistans" are ecological equivalents of fungi and share morphological, biochemical, and molecular characteristics with the chromophytic algae as members of the newly recognized kingdom Stramenopila.

This under-studied group of organisms continues to have a profound negative impact on agriculture and thus on the use of agricultural products as potential renewable energy sources. The affected crops include historical mainstays of the global food supply (e.g., maize and soybeans) as well as those that are becoming important as renewable fuel energy sources.

This project takes a broader than usual view of a sequencing project in that it is not designed to provide definitive data for a single organism, but rather to provide a more focused understanding of the diverse relationships within an economically important and poorly understood group of organisms. Results from this study should benefit all members of the scientific community involved with some aspect of stramenopile research. The definitive analysis of these mitochondrial genomes should permit a more robust analysis of the evolutionary relatedness between oomycetes, hyphochytriomycetes, and chromophytes. The more immediate economic application is the likely use of data for design of rapid identification assays to monitor infectious oomycete agents in aquaculture, to which molluscan and crustacean larval forms are especially susceptible.

Principal Investigators: Michael E.S. Hudspeth and Deborah S. S. Hudspeth (Northern Illinois University). ♦

NIU program gives high school students unique insights into human anatomy

by Tom Parisi — Feb. 6, 2006, issue of Northern Today

The use of cadavers in the study of the human body is a common practice in medical schools and health-related college curriculums. But a unique program using cadavers at NIU is providing intensive lessons in human anatomy to a new audience: high school students.

This February through May, more than 350 juniors and seniors from 11 high schools in the region spent a day or two at NIU studying prosected (pre-dissected) human cadavers.

The program, which has received glowing reviews from teachers and students alike, goes well beyond the average field-trip experience. Students spend at least a full day in the laboratory working their way through assignments tailored for their specific classrooms. Grades count back at the students' hometown schools.

“It's an experience like none other for high school students, and one that we hope will spark interest in pursuing careers in the health professions,” said Chris Hubbard, the NIU professor of biological sciences who teaches anatomy at the university and runs the outreach program for high school students.

“Students at the high schools flock to get into these courses,” he added. “They think it's cool.”

Since it was launched three years ago, enrollment in the short-course in human anatomy has more than doubled. It's so popular that Hubbard has received inquiries from as far away as Houston, Texas. Several area schools hoping to participate this spring had to be turned away.

NIU offers a master's degree program with a specialization in human anatomical science, designed to equip graduates to teach anatomy and physiology at the community college and high school levels. Two graduates of that program came up with the idea of bringing their high school students to NIU, and Hubbard later expanded the outreach effort.

“Our goal was to provide instructional resources that are otherwise unavailable in high schools,” Hubbard said. “We also wanted to give students a unique inquiry-based course that places the responsibility for learning on them. When students learn by doing, the science classroom becomes an exciting challenge.”

High school science teachers see multiple benefits of the program.

“I think it's good exposure for kids that are thinking about going into a health field,” said Sharon Olson, a biology teacher at Wheaton Warrenville South High School. She brought her Advanced Placement Biology class to NIU for the third consecutive spring.

“In order to spark that future nurse or doctor, oftentimes it is that practical hands-on experience that does it for them,” Olson said. “They come away saying, ‘Yeah, I know this is what I want to do now.' I had students say that last year. I've also had one or two over the years who said, ‘I don't think I could do this.' Either way it’s good.”

Prior to the short course, high school teachers attend a lab orientation, view the facilities and then develop a syllabus suitable for their classroom needs. When students arrive, they don protective eyewear and rubber gloves and spend one to two days rotating through five different work stations, including three with cadavers.

“When the students first come in, they're sort of standing there wondering what they've gotten themselves into,” Hubbard said. “But it's not the macabre setting that people might imagine.

“We explain that few students, aside from those pursuing health-related degrees, have an opportunity to learn about the human body in this way,” he added. “We stress that this will be a positive experience, and that they must treat the cadavers with respect. When we finally whisk off the sheets, there's not much reaction at all. Once they put on the gloves, the reticence is gone.”

In addition to Hubbard, NIU graduate students and Dan Olson, who directs the anatomy lab, man the laboratory stations, providing introductory information and answering student questions.

The cadavers are prosected in such a way that organs are removable for study. “If we're examining the respiratory system, for example, we might remove a lung and hand it around,” Hubbard added. “The students are amazed, and when learning about anatomy, it's important for them to not only recognize different organs but also to understand what they feel like.”

Hubbard said he is looking into ways of possibly expanding the program, but it would require more personnel and more cadavers. The NIU Department of Biological Sciences has maintained its own body donor program since 1990. Like other programs across the country, NIU is experiencing a severe shortage of donors. ♦

> “In past years, high school students visiting NIU for the short course have performed dissections, but this year we simply don't have enough bodies,” Hubbard said, adding that NIU programs in physical therapy and physical education both use the cadaver laboratory as well. “Most of our donations come from people in this region, and they must specifically sign up with us.”

More information on the body donation program is available online at www.bios.niu.edu/body_donation.html.

Dinosaur documentary
features NIU Ph.D. student, faculty

Northern Today, July 20, 2006

"*The Mystery Dinosaur,*" a documentary that premiered on July 24, on The Science Channel, tells the story of Jane, a pristine dinosaur skeleton unearthed in southeastern Montana by a group of mostly amateur fossil hunters from the Burpee Museum of Natural History in Rockford, where the dinosaur is now prominently displayed. The documentary featured interviews with an NIU student and faculty member.

Mike Henderson, curator of earth sciences at the Burpee and a Ph.D. student in geology at NIU, led the Montana expeditions that discovered the dinosaur and brought its skeleton back to Rockford. In the director's cut version of the documentary screened in Rockford earlier this summer, Henderson is prominently featured, while NIU Foreign Languages and Literature Professor Bill Harrison also has a speaking role.

Harrison was one of two members of the 2001 expedition who spotted the toe bone of Jane jutting from a butte. In addition to teaching Spanish and Portuguese at NIU, he is a student of paleontology.

Jane was built to kill. Twenty-two feet long and 7 1/2 feet high at the hip, the dinosaur during its day tipped the scales at about 1,500 pounds. It had 72 serrated teeth.

Created by Chicago husband-and-wife filmmakers Dave and Kathy Monk of Brave New Pictures, the documentary also includes footage of NIU geologist Reed Scherer and biologist Michael Parrish. Both worked on Jane as advisers, helping to decode the fossil's secrets. NIU alumnus and world-renowned dinosaur hunter Paul Sereno also is interviewed in the documentary.

Jane's discovery is of particular interest to paleontologists. Some scientists have argued that the specimen represents the discovery of a rare pygmy version of *Tyrannosaurus rex*, dubbed Nanotyrannus. Supported by other scientists, the Burpee Museum has concluded the dinosaur is a juvenile *T. rex*.

The story had great appeal to TV executives, according to Dave Monk.

"Most of these people were amateurs, going out in the field for the first time, just hoping to bring back something for their museum," he said. "They came back with one of the rarest dinosaurs on the planet."

While Jane's pedigree is still debated, much is known about the dinosaur. It lived 66 million years ago and died at the age of 11 years."I think the balance of evidence favors the interpretation of Jane as a juvenile *T. rex*, although that's not universally accepted," Henderson said. "But that's what science is all about—discovery and debate." ♦

Paul Sørensen Appointed Adjunct Curator of Botany for the Burpee Museum of Natural History

The Collections and Research Committee of the Burpee Museum of Natural History voted to extend to Professor Paul Sørensen the position of adjunct curator of botany for the museum. Sørensen is a professor emeritus and the curator of the herbarium for the NIU Department of Biological Sciences. His knowledge of local flora and his experience as curator of the herbarium at NIU qualify him as the ideal person to guide the growth and development of the museum's herbarium collection.

The museum has benefited from Sørensen's botanical knowledge of in numerous ways. Most recently, he served as lead consulting scientist in assisting the museum staff in planning, development, and installation of the "Windows to Wilderness" exhibition, which continues to benefit general visitors and school groups more than two years after the exhibit opened to the public. The task of improving the herbarium collection and elevating it to the next level in terms of its quality, depth and diversity couldn't be placed in more capable hands. ♦

Attention Alumni:

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DEGREE/YEAR RECEIVED/INSTITUTION

Mail to: Department of Biological Sciences
Northern Illinois University
DeKalb, IL 60115

2005-2006 | Publications

(faculty, staff, undergraduate and graduate student names are in bold)

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Layman Lecture Series

Renowned evolutionary biologist W. Ford Doolittle of Dalhousie University in Halifax, Nova Scotia, came to Northern Illinois University to present the annual Layman Lecture Series this summer.

Doolittle serves as the Canada Research Chair in Comparative Microbial Genomics at Dalhousie University and is a fellow of the Royal Society of Canada, the American Academy of Microbiology and the National Academy of Sciences. He leads a research group that focuses on the evolution of genes and genomes. Widely published in professional journals, his work has broadly contributed to the study of the cell evolution.

Doolittle presented a seminar, titled "Uprooting the Tree of Life." He also led a second more technical seminar, titled "Population Metagenomics of Extremophilic Bacteria and Archaea."

The Layman Lecture series is endowed by David Layman, an NIU alumnus who taught high school biology in Chicago public schools for nearly 40 years. The lecture series invites speakers to campus to discuss timely and compelling topics in biology. ♦

Nerodio | 2006

by Professor Richard King

- The 2006 annual spring Lake Erie watersnake census (Nerodio 2006) occurred from 30 May - 11 June 2006.
- Twenty-five field workers (Table below) participated for anywhere from one day to the entire two weeks of the census.
- In total, data were collected for more than 1,450 Lake Erie watersnake captures.
- Especially noteworthy were the recaptures of two Lake Erie watersnakes, initially marked 9 and 10 years ago (in 1997 and 1996). These snakes, both males, were adults when initially marked. Their recapture extends the maximum observed survival of adult Lake Erie watersnakes to 10 years. 1996 represents the first year that watersnakes were marked using passive integrated transponder (PIT) tags and the first year of Lake Erie watersnake field work following a three-year hiatus (1993, 1994, 1995). Thus, it is possible that adults sometimes survive even longer than 10 years, as may be documented in future annual censuses.
- Mark-recapture data collected during Nerodio 2005 and Nerodio 2006 will be used to update estimates of Lake Erie watersnake population size based on data collected from 1980 – 2004 (King, Queral-Regil, and Stanford, 2007, Herp. Monographs, in press). ♦

Participant	Affiliation
Rich King	Northern Illinois University
Kristin Stanford	Northern Illinois University
Peter Jones	Northern Illinois University
Jesse Ray	Northern Illinois University
Abbey Pattishall	Lehigh University
Matt Close	Lehigh University
Chuck Gunn	Area resident
Kent Bekker	Toledo Zoo, Bowling Green State University
Eric Knightley	Ohio State University
Kelsey Reider	Ohio State University
Jen Cline	Maryland State Police (formerly NIU)
Ben Warner	Mount Vernon College
Tyler Lawson	Baldwin Wallace College
Allison Sacerdote	Northern Illinois University
April Sidoti	Baldwin Wallace College
Tim Herman	Toledo Zoo, Bowling Green State University
Maria Tumeo	Toledo Zoo
Chad Waffen	Area resident
Norm Damm	Northern Ohio Association of Herpetologists
Andy Avram	Lake County Metroparks
Greg Kremer	Area resident
Megan Seymour	U.S. Fish and Wildlife Service
Matt Thomas	Ohio State University, F. T. Stone Laboratory
Karyn Tremper Allman	U.S. Fish and Wildlife Service
Phil Allman	Ohio University

2006 Faculty | Department of Biological Sciences

- **Neil Blackstone**—Evolution of Development and Complexity. neilb@niu.edu
- **Jozef Bujarski**—Plant Molecular Biology; Molecular Virology. jbujarski@niu.edu
- **Ana Calvo**—Microbiology; Molecular Biology; Fungal Genetics. amcalvo@niu.edu
- **Sonya Conway**—Endocrinology; Neuro-Endocrine Control Systems. sonya@niu.edu
- **Melvin Duvall**—Molecular Phylogenetics and Evolution. mel-duvall@niu.edu
- **Kenneth Gasser**—Cell Physiology. kgasser@niu.edu
- **Richard Hahin**—Nerve and Muscle Physiology; Biophysics. hahin@niu.edu
- **Stuart Hill**—Pathogenic Microbiology. sahill@niu.edu
- **Gabriel Holbrook**—Plant Physiology; Plant Biochemistry. gholbrook@niu.edu
- **Christopher Hubbard**—Endocrine Cell Signaling and the Effects of Growth Factors on Cell Growth and Metabolism. chubbard@niu.edu
- **Michael Hudspeth**—Molecular Biology; Organelles; Mycology; Fungal Plant Pathogens. mykes@niu.edu
- **Mitrick Johns**—Plant and Animal Molecular Genetics; Bioinformatics. rjohns@niu.edu
- **Barbara Johnson-Wint**—Development; Matrix Modelling and Remodelling; Gravitational Biology. barbara-johnson-wint@niu.edu
- **Bethia King**—Behavioral Ecology; Evolution; Entomology. bking@niu.edu
- **Richard King**—Evolutionary Ecology; Herpetology. rbking@niu.edu
- **David Lotshaw**—Cell Physiology; Ion Channels and Signal Transduction. dlotshaw@niu.edu
- **Long Mao**—Bioinformatics; Plant Genomics/Functional Genomics. lmao@niu.edu
- **R. Meganathan**—Microbiology; Microbial Physiology; Biochemistry; Genetics and Molecular Biology. meganathan@niu.edu
- **Peter Meserve**—Population and Community Ecology; Biogeography; Biology of Birds and Mammals. pmeserve@niu.edu
- **Jon Miller**—Cellular Physiology; Invertebrate Immunology. jsmiller@niu.edu
- **John Mitchell**—Cell Physiology; Molecular Biology. jmitchell@niu.edu
- **Virginia Naples**—Anatomy; Functional Morphology; Mammalogy; Forensic Anatomy; Vertebrate Paleontology. vlnaples@niu.edu
- **Neil Polans**—Genetics; Mapping and Evolution of Complex Traits; Plant Systematics. npolans@niu.edu
- **Thomas Sims**—Self-incompatibility in Petunia; Molecular Biology. tsims@niu.edu
- **Joel Stafstrom**—Developmental Botany; Cellular/Molecular Biology. stafstrom@niu.edu
- **Ronald Toth**—General Botany; Economic Botany; Creation/Evolution Debate. t80rxt1@wpo.cso.niu.edu
- **Carl von Ende**—Population and Community Ecology; Aquatic Ecology; Plant Ecology. cvonende@niu.edu
- **Linda Yasui**—Radiation Biology; DNA Damage and Repair in Chromatin. lyasui@niu.edu
- **Shengde Zhou**—Microbiology. szhou@niu.edu

Emeritus/Adjunct Faculty

- **Jack Bennett**—Genetics; Population and Behavior Genetics.
- **Anne Berg** *(visiting professor)*—Epidemiology of Epilepsy.
- **W. Elwood Briles**—Avian Immunogenetics.
- **Thomas Conway**—Immunology; Histocompatibility Antigens; Monolonal Antibodies.
- **Elon W. Frampton**—Microbiology; Molecular Biology; Virology.
- **James Grosklags**—Mycology.
- **Arnold Hampel—**Molecular and Cellular Biology; Biochemistry.
- **Laszlo Hanzely**—Developmental Biology.
- **Kenneth Harmet**—Plant Physiology.
- **Darryl Lynch**—Microbiology.
- **Lowell Nicolaus**—Ethology.
- **Michael Parrish**—Vertebrate Paleontology; Functional Morphology; Systematics; Paleoecology.
- **K.V. Prahlad**—Developmental Biology.
- **Robert W. Pearson**—Environmental Biology; General Biology.
- **Charles Rohde**—Mite Biology.
- **O. Arne Schjeide**—Cell Biology; Animal Ultrastructure.
- **Paul Sørensen**—Plant Taxonomy; Systematics; Ecology; Conservation.
- **Marvin J. Starzyk** Aquatic/Pathogenic Microbiology; Microbial Ecology.
- **Patricia Vary**—Microbial Genetics; Molecular Biology; DNA Replication.
- **Jerrold Zar**—Physiological Ecology; Biostatistics; Environmental Biology.

Alumni Profile | Professor. Thomas J. Near

by Professor Richard King and Professor Michael Parrish

Thomas J. Near (B.S. 1993, M.S. 1995, Ph.D. 2005) came to NIU as an undergraduate in the CHANCE program. Through this program, NIU seeks to identify and nurture undergraduate students not meeting traditional admission criteria but who demonstrate strong motivation and potential for success through special talents, significant activities and accomplishments, leadership potential, personal commitment, and goal orientation.

Tom clearly found his place at NIU and excelled as a double-major, earning a B.A. in history and a B.S. in biological sciences in 1993. In the summer of 1992, Tom participated in a National Science Foundation Research Experience for Undergraduates project with Professor Richard King. This project began with three weeks of field work in Ohio, Michigan, and Ontario, collecting snake tissue samples for molecular genetic analysis. Tom clearly enjoyed this experience and was both energetic and personable throughout long hours under sometimes harsh conditions. It was also at this time that Tom started conducting undergraduate research with Professor Steve Nadler (now at the University of California, Davis). It was in Nadler's lab that Tom first learned the molecular genetic and analytical techniques that he has used so successfully in his career. Tom stayed at NIU for two more years, earning a master's degree in biological sciences in 1995 under Nadler's guidance, focusing on evolutionary relationships among parasitic nematode worms.

After leaving NIU, Tom entered the Ph.D. program in Ecology, Ethology, and Evolution at the University of Illinois Urbana-Champaign. It was here that Tom's interest in fish emerged and he completed his Ph.D. in 2000, conducting molecular evolutionary research on a variety of fish species native to the central and southern U.S. This work continued during postdoctoral appointments at the Center for Population Biology and the Department of Evolution and Ecology at the University of California, Davis, from 2000-2003.

In 2003, Tom accepted a position of assistant professor in the Department of Ecology and Evolutionary Biology at the University of Tennessee. More recently, he accepted a joint position as assistant professor in the Department of Ecology and Evolutionary Biology and Curator of Fishes of the Peabody Museum at Yale University. Needless to say, this is a remarkable achievement for someone in such an early stage of his academic career.

Tom's academic accomplishments are stellar. He has already assembled an extensive publication record consisting of dozens of original peer-reviewed research papers in a wide range of highly visible and critically acclaimed journals. Several recent papers, published in the *Philosophical Transactions of the Royal Society: Biological Sciences, American Naturalist, and Evolution*, describe innovative new analytical techniques that Tom has developed to better calibrate molecular evolutionary data using fossil data. We anticipate that these techniques will greatly increase the value of the large molecular genetic data sets that are now routinely generated in biology.

Tom also has a reputation as a valued colleague and teacher. He was an active participant in formal and informal activities within the Department of Biological Sciences while at NIU. At the University of Illinois, he was ranked as Outstanding Teaching Assistant. Although undergraduate life may be a distant memory, many of us can still name a single professor who made a lasting impact on our lives. We expect that as Tom's academic career progresses, he will be that one professor for many students. ♦

Kristin Stanford (*Ph. D. student, R. King lab*) contacted Discovery Channel's *Dirty Jobs* host Mike Rowe about her own job, catching Lake Erie watersnakes, making them regurgitate, and studying what comes up. Kristin was joined by Mike Rowe and his film crew for a day of filming this summer. The show airs on Tuesday nights at 8 p.m. The "snake barfing" episode is due to air sometime in September, so be on the lookout for our own student and her "dirty job!" ♦

left: Kristin Stanford, Mike Rowe, and film crew on site.

above: Mike and Kristin in the lab.

Facility improvements

by Professor Richard Becker

The past year was a particularly good year for upgrades and improvements to the biology teaching and research infrastructure. A much needed upgrade to the biology student computer lab has just been completed in time for fall courses. The lab now sports a structured cable management system and new Pentium IV class PCs with flat screen LCDs. Alumni donations to the department were key in bringing this renovation to fruition. Replacement of the antiquated cage washer in our animal facilities is underway funded via a joint endeavor between the department and the Division of Finance and Facilities. Other improvements included procurement of a new set of Nikon microscopes for our bacteriology/microbiology courses, and addition of a growth chamber to our plant growth chamber facility. Substantial

capabilities were added to the department microscopy facility via upgrades to our confocal imaging system as well as acquisition of a research grade light microscope with digital imaging capability. Last but not least, a new state-of-the-art high pressure liquid chromatography system was acquired, which will enhance our ability to separate and identify a wide range of biomolecules. ♦

News From the Bujarski Molecular Virology Laboratory

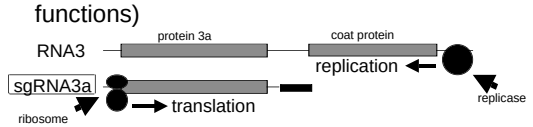
Discovery of a novel 5' subgenomic RNA in brome mosaic bromovirus.

by Professor Jozef Bujarski

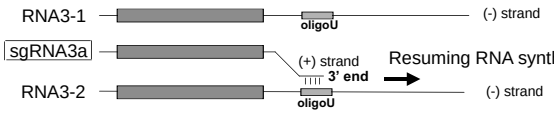
Our ongoing research program concentrates on molecular mechanisms of genetic RNA recombination in single-stranded RNA viruses, by using brome mosaic bromovirus (BMV) as a well-characterized model system. Our data demonstrated some time ago that promoters of RNA replication could serve as recombination hot spots. Specifically, an internal promoter of subgenomic (sg) RNA synthesis in a dicistronic genomic BMV RNA3 has been found to support efficient homologous crossovers. Recently we have observed the accumulation of a novel subgenomic RNA in the BMV infected tissue. After close characterization, it turned out that these molecules (designated as sgRNA3a) represented the 5' half of BMV RNA3 and are translationally active. Most importantly, sgRNA3a can serve as a molecular primer that secures frequent recombination events at the sg promoter. We are now concentrating on the molecular mechanisms of these events. This discovery has implications for better understanding of factors that control RNA recombination, and also sets up a novel view over the strategies RNA viruses have available to translate their proteins from 5'-proximal open reading frames (ORFs), namely, in order to avoid a conflict between RNA replication and translation processes, RNA viruses make nonreplicating 5' sg RNAs to translate proteins from 5' ORFs whereas full-length genomic RNAs serve as replicating (and recombining) reservoirs of genetic information. ♦

Putative Functions of sgRNA3a

- In translation (separation of translation from replication functions)



- In recombination (the 3' end of sgRNA3a re-hybridizes to another RNA3 template and re-primes RNA copying)



Grants Awarded | 2006

Professor	Grant	Funding Agency	Amount
Berg, A.	Long-Term Outcomes of Childhood Epilepsy	*U.S. Department of Health and Human Services*	842,218
Blackstone N.	Collaborative Research: Assembling the Tree of Life - An Integrative Approach to Investigating Cnidarian Phylogeny	*National Science Foundation*	99,577
Bujarski, J.	RNA Recombination at the Subgenomic Promoter in Brome Mosaic Virus: Relationship with Transcription	*National Science Foundation*	150,000
Bujarski, J.	Genetic Link Between RNAi/PTGS and Viral RNA Recombination	*U.S. Department of Health and Human Services*	217,500
King, R.	Continued Education and Outreach Toward the Implementation Recovery of the Lake Erie Watersnake (Nerodia sipedon insularum)	*Ohio Department of Natural Resources*	50,463
King, R.	Lake Erie Watersnake Monitoring: Use of Artificial Hibernacula	*Ohio Department of Natural Resources*	10,921
King, R.	Effects of Habitat Restoration on Herpetofauna of MacArthur Woods	*Lake County Forest Preserve District*	24,492
King, R.	Protecting Lake Erie Coastal Amphibians and Reptiles through Public Stewardship	*Department of the Interior*	8,000
King, R.	Lake Erie Watersnake Recovery Plan Implementation	*Ohio Department of Natural Resources*	41,110
King, R.	Lake Erie Watersnake Recovery Plan Implementation	*Department of the Interior*	40,912
Meserve, P.	LTREB: A Long-Term Investigation of the Interplay of Biotic vs. Abiotic Factors in a Chilean Semiarid Community	*National Science Foundation*	60,000
Mitchell, J.	Antizyme-mediated Inhibition of polyamine transport	*U.S. Department of Health*	6,943
Vary, P.	Subcontract: Microbial Genome Sequencing of Bacillus megaterium QM B1551	*The Institute for Genomic Research (TIGR)*	41,168
Department Total			1,593,304

Departmental News

Faculty:

Professor Richard Becker - *Presented/Abstracts:*

- Frieders, D. Y. Ranganathan, R. Becker, R. Meganathan; 2006. *Methylotetracoccus bentleyi* gen. nov., sp. nov., A Novel Facultative Methylotroph. Ann. Meet. Amer. Soc. Microbiol. Miami, Florida.
- Restaino, L., E.W. Frampton, W.C. Lionberg, and R.J. Becker. 2005. A New Chromogenic Plating Medium for the Isolation and Identification of *Enterobacter sakazakii*. Ann. Meet. International Association of Food and Milk Sanitarians (IAFMS). Chicago, Illinois.

Professor Ana Calvo - *Presented/Abstracts:*

- American Society for Microbiology 106th General Conferences. Elucidation of regulatory mechanisms controlling sclerotial development and aflatoxin biosynthesis in *Aspergillus flavus* by Functional Genomics. Orlando, Florida, May 21 - 25, 2006.
- VIII International Conference of Fungal Genetics. The *FvveA* gene regulates filamentous growth and conidiation pattern in *Fusarium verticillioides*. Vienna, Austria, April 8-11, 2006.
- VIII International Conference of Fungal Genetics. *VeA* subcellular localization is dependent on light in the filamentous fungus *Aspergillus nidulans*. Vienna, Austria, April 8-11, 2006.
- Invited Speaker. III Aspergillus meeting. *VeA* subcellular localization is dependent on light in the filamentous fungus *Aspergillus nidulans*. April 8, 2006.
- Speaker. XXVIII Annual Aflatoxin Elimination Workshop. Production of Cyclopiazonic acid, Aflatrem and Aflatoxin is regulated by *veA*, a gene necessary for sclerotial formation in *Aspergillus flavus*. North Carolina. October 24-26, 2005.

Professor R. Meganathan

- Frieders, D.,Y. Ranganathan, R. Becker, R. Meganathan. 2006. *Methylotetracoccus bentleyi* gen. nov., sp. nov., A Novel Facultative Methylotroph. Abstracts of the general meeting of the American Society for American Society for Microbiology. Abstract # R-092.
- Ranganathan, Y., D. Frieders, R. Meganathan. 2006. Evidence For Plasmid Mediated Carotenoid Biosynthesis From A Novel Facultative Methylotrophic Soil Isolate. Abstracts of the general meeting of the American Society for American Society for Microbiology. Abstract # I-107.
- Royan, S.V., and R. Meganathan. 2006. Regulation of the *E. coli* Ubiquinone (Coenzyme Q) Biosynthetic Gene *ubiG*. Abstracts of the General Meeting of the American Society of Microbiology, Abstract #. K-118.

Professor Jozef Bujarski

- Patent Application: Bujarski J. and Wierzchoslawski R. 2006. METHOD OF PRODUCTION AND APPLICATION OF THE RNA POLYMERASE PROTEIN FROM BROME MOSAIC BROMOVIRUS.
- Presented, "Mechanisms of RNA recombination in RNA viruses." 2nd Conference of the Polish Society of Plant Molecular Biology. September 2005. Poznan, Poland.
- Presented,"Using *Arabidopsis* Gene-knockout Lines for Testing the Role of RNA interference (RNAi/PTGS) Genes in the Infectivity and RNA Recombination of Brome Mosaic Bromovirus." XII International Congress On Molecular Plant Microbe Interactions. Merida, Mexico, December 2005.
- Invited speaker"Mechanisms of homologous recombination at the subgenomic promoter in brome mosaic virus" Workshop on Plant RNA Viruses, S.R. Noble Foundation, Ardmore, OK, March 2006.
- Presented,"Role of a novel sgRNA3a in homologous recombination of brome mosaic bromovirus." University of Barcelona, Spain, June 2006.

Professor Linda Yasui

- Arlene Lennox, S. Gutting, C. Andorf, L.S. Yasui. The DNA Damage Response Induced by Fast Neutron Irradiation. 2nd International Workshop on Fast Neutron Therapy. Essen, Germany. Sept. 2006.
- Invited Speaker: "Imaging radiation-induced γH2AX foci." Microscopy and Microanaysis meeting (64th MSA, 40th Micro Beam Analysis Society, 39th International Metallographic Society, 33rd Microscopical Society of Canada). Chicago, IL Aug. 2006.
- K. Mork, T.P. Jones, L.S. Yasui. Detecting DNA double strand breaks. Argonne National Lab Undergraduate Symposium and CSUI. Nov. 2005.
- L. S. Yasui, K. Chen, K. Wang, T.P. Jones, J. Caldwell, D. Guse, A.I. Kassis. 2006."Using Hoechst 33342 to target radioactivity to the cell nucleus." Joint Radiation Research Society and ASTRO meeting, Denver, CO. Oct. 2005.

Former NIU Biology professor Wayne J. McIlrath, 84, of DeKalb and Lee, Ill., died Friday, March 24, 2006, at home.

Born Oct. 18, 1921, in Laurel, Iowa, he was the son of R. Kenneth and Mamie Lee McIlrath. His early years were spent in Laural, Gilman and Newton, Iowa. A graduate of the University of Northern Iowa, he received his master's and doctorate degrees in biological sciences from the University of Iowa.

He served 4 1/2 years of active duty as a military educator and retired as a colonel after 36 additional years in several research and development units of the Army reserve.

For most of Wayne's adult life, he was a professor and researcher in the field of plant physiology. He was a faculty member at University of Iowa, Texas A&M, University of Chicago and Northern Illinois University. He was dean of the graduate school at NIU from 1964-1973 and taught in the biological sciences department from 1973 until his retirement in 1987. After retirement from NIU, he coordinated the DeKalb County Master Gardener program for a number of years.

He is survived by his wife of 63 years, Mary Wilson McIlrath; three daughters, Janet Rosenberg, Peggy James and Nancy McCabe; two sons-in-law, Michael McCabe and Larry Nordstrom; four grandchildren, Eli Dawson, Maren Rosenberg and Erin and Michaela McCabe; a brother, George (Donna) McIlrath; and a sister-in-law, Helen McIlrath.

Graduate Students:

Mike Rowe, the star of the Discovery Channel's show "Dirty Jobs," (Tuesdays at 8p.m. central) and his crew joined Kristin Stanford (Ph. D. student, R. King lab) to film a day of snake catching and snake barfing (to see what they eat) on Thursday, Aug. 17.

News | continued...

Andrea Previtali and Lazaro Guiñazú had a baby girl, Luz Sienna Guiñazú, at Provena Mercy Hospital in Aurora on August 7, 2006. Andrea is an RA on Professor Meserve's grant this fall, will be graduating in December with a Ph.D., and will be starting a post-doc at the University of Utah, Salt Lake City, in January 2007.

Theresa Wusterbarth (R. King and Duvall labs, Ph.D.'06) has taken a job as anatomy/physiology instructor at Northeast Wisconsin Technical College in Green Bay, Wisconsin.

Tommy Krebs (M.S. 06, von Ende lab) has accepted a position with an environmental consulting firm in Atlanta, GA.

Alumni:

Mary Crowe (Ph.D. '94, B. King lab) became director of the Office of Undergraduate Research at the University of North Carolina-Greensboro this spring.

Colleen Lynch (M.S. '94, B. King lab) has begun work on a Ph.D. at University of South Dakota, working on conservation genetics and restoration of a dragonfly in IL and WI. She will also stay on as a consulting population biologist at Lincoln Park Zoo.

"Palani" Palaniappan (Ph.D., '92, Meganathan lab) has been appointed vice president, Research and Development, Labeling and Detection Technologies at Invitrogen Corporation.

Jason Martina (B.S. 04, M.S. 06, von Ende lab) has entered the Ph.D. progarm in Plant Biology at Michigan State University. He will work with Merritt Turetsky on the biogeochemical and ecological impacts invasive species have on Michigan wetlands, with an emphasis on the Great Lakes coastal wetalnds.

Staff:

Christopher L. Baker, 32, of Dixon, Ill., died Tuesday, Sept. 6, 2005, at home. Born June 26, 1973, in Sterling, he was the son of Carthel and Kathleen (Shaw) Baker. He spent several years as an in-home caregiver for the elderly, before he joined the staff of the Department of Biological Sciences Greenhouse facility. ♦

Annual Picnic

The Department of Biological Sciences kicked off the new fall semester with the annual picnic to welcome new graduate students on August 24, 2006. ♦

Awards...

2006 Honors Convocation • April 27, 2006

- **Department Honors** - Gabrielle Geddes, Christine Hunsicker, Kyle Mork
- **Charles E. Montgomery Award** - Leslie Oldham
- **David Layman Scholarship** - Randi Williams
- **Exemplary Student Teacher Award** - Christine Brown, Kate Konkel
- **Mortar Board** - Ashley Anderson, Christine Nagel, Jonathon Clifford, Tara Salley
- **Phi Sigma Graduate Research Award** - Thynn Thane
- **Phi Sigma Undergraduate Research Award** - Kyle Mork, Brett Donkin
- **PMBC Graduate Research Assistantship** - Joseph Dertien, Rachel Moreno
- **PMBC Undergraduate Research Fellowship** - Matthew Long
- **Dean's Award** - Owais Malick
- **Harvey A. Feyerherm Award** - Tarik Alshaikh
- **George L. Terwilliger Award** - Jennifer Kubic, M. Andrea Previtali
- **Sidney Mittler Award** - Sandhya Royan
- **University Fellowship** - Julie Heldt
- **Outstanding Graduate Teaching Assistant Award** - Theresa Wusterbarth
- **Dissertation Completion Award** - Thynn Thane
- **Alumni Award** - Christopher Jones
- **Jerrold H. Zar Scholarship Award** - Brad Lindstrom
- **Cancer Federation Scholarship Award** - Timothy Patrick Jones
- **NIU at Oxford 2004 Biological Sciences Scholarship** - Paula Bartel, Samantha Fischer
- **August M. Gorenz Award** - Gabrielle Geddes, Ashlee Williams
- **Marguerite Key Research Award** - Janet Truckenbrod
- **University Fellowship Award** - Jason Martina
- **University Fellowship Award** - Gabrielle Geddes, Ashlee Williams

Above, left: **Professor Tom Sims** presented **Thynn Thane,** Ph.D. student, Mitchell lab, with the Dissertation Completion Award. right: **Professor Jozef Bujarski** presented **Joseph Dertien**, Ph.D. student, Duvall lab, with the PMBC Graduate Research Award.

Degrees Awarded | 2005-2006

Undergraduate Degrees

August 2005

Button, Max Yevgenievich
Hanson, Bryan Wayne
Kamien, Richard
Miller, Tiffany Lauren
Presler, Megan Mulligan
Volintine, Georgene Marie
Weber, Cailin Elizabeth

December 2005

Ahmed, Christianne Marie
Anderson, Suzanne
Ayala, Wendy Guadalupe
Barrick, Kelsey Anne
Bowers, Justin John
Bradley, Ashley Lauren
Hinton, Michael Allen
Hudson, Brandy Nicole
Hunsicker, Christine Ellen
Iverson, Andrew Glenn
Jennette, Jessie Marie
Kolzow, David Wayne
Lapapa, Joseph Nicholas
McClure, Randle Vincent
Pappachen, Kalpana
Patel, Tina G.
Saunders, Shavonne Kelley
Smith, Jessica Christi
Sullivan, Carl James Gregory
Szerszen, Leanne Terese
Tokarz, Thomas
Toonen, Joseph Anthony
Zarr, Rebecca Ann

May 2006

Althoff, Eric Scott
Borresen, Jennifer Wiseman
Burmeister, Bettisue
Carley, Ryan Jason
Dalton, Conor R.
Denning, Damon Paul
Donkin, Brett Thomas
Driessen, Shannon Ann
Endre, Andrea Ruth
Geddes, Gabrielle Christine
Hilby, Daniel James
Hoambrecker, Sandra Mary
Johnson, Jennifer Elizabeth
Karczynski, Elizabeth Kathryn
Kopparthi, Ashwin T.
Koster, Sarah Marie
Luketich, Samantha Jolene
Malick, Owais Mohammad
Marchand, Gerard Willie
Martin, Brett
Martinez, Robert Luis
Mattson, Jeremy Gene
Mcestes, Ashley Marilyn
Modaff, Erika Lee
Mork, Kyle Corso
Nicholson, Jessica Marie
Oldham, Leslie Mcgrath
Patel, Avani N.
Pepper, Robert Joseph
Petersen, Renee Elyse
Pitsch, Jennifer Nicole
Pittluck, Michelle Louise
Plonczynski, Katrina Josephine
Rabjohn, Matthew James
Richards, Stacy Lynn
Schuette, Erica Lynn
Scruggs, Manda Renee
Shackle, Helen M.
Shah, Aekta Satish
Shahbain, Hanan A.
Simpson, Derek Richard
Stevens, Joshua Lee
Swagger, Mittina D.
Teepe, Michael Roger
Thoss, Dana L.
Vandevoorde, Kristen Anne
Weaver, Christopher Scott
Wheeler, Patricia Michelle
Whipple, Scott James
Williams, Ashlee Lyn

Graduate Degrees

August 2005

Ervin, Autumn J. (M.S.)
Robinson, Jace W. (M.S.)
Pantaleo Lea R. (M.S.)*
Sorkin, Boris (Ph.D.)

December 2005

Robbins, John S. (M.S.)
Voss, Stacie L. (M.S.)
Yu, Nanjia (M.S.)

May 2006

Bridges, Demetrius A. (M.S.)
Doolen, Joseph F. (M.S.)
Ruback, Patricia A. (M.S.)
Brown, Leith I. (M.S.)*
Rio, Jennifer M. (M.S.)*
Connelly, Rhykka L. (Ph.D.)
Robins, James H. (Ph.D.)

**M.S. with specialization in Human Anatomical Sciences*

Phi Sigma Honors Society

Research Symposium

by Professor Kenneth Gasser

The Phi Sigma Biological Honor Society sponsored the annual student research symposium in the Department of Biological Sciences on Saturday April 8, 2006. Research results were presented by 10 undergraduate and 24 graduate students. The projects represented the diversity of departmental interests and included the influence of an El Nino event on small mammal populations in Chile, redox signaling in hydroids, exocytosis physiology in the pancreas, DNA repair mechanisms, molecular genetic studies of development in a filamentous fungus, polyamine regulation and the role of antizyme, genetic exchange and evolution in the tropical Guayacan tree, mating behavior in parasitoid wasps, biochemistry of photosynthesis, ecology of Lake Erie watersnakes, role and regulation of DRG G-proteins in *Arabidopsis*, predation patterns of the freshwater backswimmer *Notonecta undulata*, characteristics of the mitochondrial genome in the genus *Pythium*, and many others. The event was attended by approximately 100 students, friends, faculty, and staff. As always, the Department of Biological Sciences is indebted to Phi Sigma for their hard work and sponsorship of this important and educational event. Special thanks go to Phi Sigma members Jessica Nicholson, Brett Martin, Leanne Szerszen, and Gabrielle Geddes for their work in organizing the symposium. Pictured at right (top) Thynn Thane, graduate research award; (bottom) Kyle Mork, undergraduate research award, presented by Phi Sigma president Jessica Nicholson. ♦

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