

Winter 2012

Biology News, Winter 2012

University of Northern Iowa. Department of Biology.

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Greetings from the Biology Department

We are pleased to once again bring you news from the Department of Biology. Our alumni, students, faculty and staff have had another successful year. This past fall, the Department claimed 728 majors, with more than 150 students earning degrees in Biology over the last academic year. As such, Biology is the second largest major on campus, and in our minds, the best major on campus!



We continue to hear from our alumni, but I would like to hear from more of you. We are very proud of your accomplishments and want to learn of them. In addition, we hope that your time spent at UNI and the Department of Biology was beneficial in your life and career. If this is the case, please let us know as we use this information to build arguments for increased funding and support of our Biology programs.

Our students continue to amaze us with their accomplishments, insights, and passion for biology. Several of our students are competing well on the national stage, being invited to selective programs and meetings. Over the past five years, more than 80 of our graduates have matriculated from medical programs at Des Moines University. Additionally, the Student Nature Society, a student organization housed in the Department of Biology was named the Student Organization of the Year, quite an accomplishment given that there are over 300 hundred such organizations on campus. Finally, Katie Berge, a Biology/Philosophy and Religions double major was the student speaker at the 2011 Spring Commencement ceremonies.

We were fortunate to hire three new individuals this past academic year. Joining our Department are Dr. Mark Sherrard, a plant physiologist/ecologist, Dr. Kim Cline-Brown, an instructor overseeing much of our liberal arts core courses for non-majors, and Mrs. Joan Smothers who is our new full-time academic advisor. We are very pleased to have these individu-

als join us. Our faculty continue to win awards for outstanding teaching and scholarship. They are active in seeking funds to support both teaching and research and this support benefits a large number of students. We were recently successful, as a department, in securing funding from the Roy J. Carver Charitable Trust to purchase modern microscopy equipment for use in teaching and research. The faculty also persist in creating opportunities for our students to participate in activities beyond UNI. Our first Taiwan student exchange program was very successful and we are beginning our second year of this program. Our students have also traveled to the Gulf Coast area of the United States to perform research where the Deepwater Horizon oil spill occurred.

Finally we continue to look for ways to financially assist our students. In that vein, the faculty have developed and supported an Alumni & Faculty Undergraduate Research Fund to help deserving undergraduate students. We are hopeful that some of you will support this fund. One can start small, contributing one dollar per year for each year since the date of their graduation from UNI. These funds go solely to supporting undergraduate students majoring in Biology. To contribute, you simply need to fill out the form on page 13 and return to UNI Foundation Financial Services, 1223 W. 22nd Street Cedar Falls, IA 50614-0239 or contact Cassie Luze at cassie.luze@uni.edu or 319-273-6360.

Bev Schomaker, Sandi Ingles, and I continue to enjoy working on the newsletter and we hope that you find it informing and entertaining. We look forward to hearing from many of you.



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Focus on UNI Biology Alumni

◆ Lisa Volesky ('02)

Lisa Volesky was named the 2011 recipient of the NABT Ecology/Environmental Science Teaching Award for not only her classroom curriculum, but for her dedication to getting students outside.



Lisa graduated from the University of Northern Iowa in 2002 with a BA in Biology with a minor in Chemistry. She has been teaching for Chicago Public Schools for eight years, and currently teaches at Northside College Preparatory High School, one of the highest performing high schools in the state of Illinois.

Growing up in rural Iowa, Lisa has a deep connection to nature. She likes to be outside, where utilizing and learning about the natural world drives the design of her ecology and environmental science curriculum. "I hope to make urban students more knowledgeable and active participants in the world around them by using the outdoors as a classroom, bringing nature into the classroom, and creating connections to the larger environmental community" said Lisa upon learning about the award. Exposing students to the living world that is around them is one of the hallmarks of her teaching, and makes Lisa so deserving of this award.

Lisa was honored by her colleagues at the NABT Award Luncheon in Anaheim.

◆ Kathryn (Katie) Berge ('11)

Katie Berge, a double major in Biology and the Study of Religions with a minor in Chemistry, was the student speaker at the spring 2011 UNI Commencement. Katie's message to her fellow graduates was to "Remember who you are. You are an Iowan and a UNI graduate. Use this to better the world around us." After graduation, Katie received an internship in Washington D.C. in the office of Senator Tom Harkin and is now employed there on a permanent basis.

◆ Cody Thompson ('04)

"As far as my time at UNI, I really benefited from working in the laboratory with Jim Demastes. He really turned me onto research and got me pointed towards graduate school.

I also took a couple of classes from him that I now teach at Texas Tech: Mammalogy and Natural History of Vertebrates. Both of these courses, as well as the undergraduate research opportunities, have shaped my personal research and teaching philosophy.

I graduated from Fort Hays State University in Hays, Kansas with my Master's in Biology in 2008. Under the direction of Drs. Elmer Finck and Jerry Choate, I studied the genetics of the hybrid zone between 2 species of short-tailed shrews in Iowa and Missouri. Since then, I have been at Texas Tech working on my Ph.D. My dissertation again is looking at a hybrid zone; however, the species of choice is ground squirrels. The dynamics are slightly different than the shrews, partly because the hybrid zone appears to have formed twice: once in the past and once within the past 100 years. My dissertation advisor is Dr. Robert Bradley.

I have been fortunate with my success, and I think it can be attributed to the strong education I received at UNI. It certainly is a place where you can be more than just a number, and people know you by your first name."

◆ Dr. Tom Hennessey ('69)

Tom Hennessey is a professor in the Department of Natural Resource Ecology and Management (NREM) of the Division of Agricultural Sciences and Natural Resources at Oklahoma State University and was named the 2011 Carl Alwin Schenck Award recipient by the Society of American Foresters. Dr. Hennessey was presented the award during the 2011 SAF National Convention in Honolulu, Hawaii.

The Carl Alwin Schenck Award recognizes devotion and demonstrated outstanding performance in the field of forestry education. Dr. Hennessey is known for encouraging students to think critically and for being an excellent field instructor. He has a reputation for seizing teachable moments whenever they occur, including "mini field trips" that breathe life and provide visual reinforcement to theoretical material presented in the classroom environment.

Dr. Hennessey has been an OSU faculty member since 1976, directing fundamental research programs investigating how water stress and soil nutrient deficiencies affect tree growth and wood formation. He has secured more than \$1.5 million in competitive grants and contracts to support his research projects over the years. His reputation as a forestry researcher has led to his being invited to speak internationally in France, Sweden, Finland, North Africa and even Estonia prior to the fall of the Iron Curtain.

Focus on UNI Biology Alumni

◆ Chase Anderson ('83)

"I am a 1983 UNI graduate from the Biology Education program at UNI where I also earned minors in Earth Science and Coaching. Although my career has taken me somewhat away from Biology and the sciences, I reflect fondly on my time at UNI at the Biology Research Center and the other buildings where I took Biology, Chemistry, and Earth Science classes. UNI is a great school and I remain appreciative of how it helped prepare me for a launch into a career in education...almost 30 years now! After spending four years teaching science, I have been holding a number of school administration positions including: Montessori Administrator, middle school assistant principal and principal, high school principal, and assistant superintendent. Currently, I am in my third year as the Superintendent of Schools for the Wayzata Public Schools in the Minneapolis area.

Thank you for carrying on the great tradition of the UNI biology department!"

◆ Ted Wilson ('94)

"I am a 1994 graduate and thought I would reconnect with my alma mater. I came across a biology newsletter in a stack of papers I was saving and it sure did trigger many wonderful memories. I am currently an Associate Professor of Biology at Briar Cliff University in Sioux City, Iowa. My true love is of course insects, which wasn't fully realized until I took entomology at UNI. My experiences at UNI helped me obtain a M.S. and a Ph.D. in entomology from Iowa State. My doctoral research evaluated the fitness of corn rootworm beetles that survived on Monsanto's Bt corn.

I know many of the current biology faculty at UNI. I had Virginia Berg's plant physiology course. I still remember her analogy of a plant acting like a straw drawing the water from the soil to the air; it really helped because those vapor gradient equations were tough! One of the first classes I took was from Dorothy Brecheisen, General Biology in 1990. I couldn't imagine putting up with that many freshmen at one time in one room!

I still have the textbook from Dr. Seager's Organic Evolution class on my shelf, *Process & Pattern in Evolution* by Avers. It's bright red and really sticks out. The conversations he led on evolution were certainly inspirational. Some of my favorite labs were with fruit flies in Genetics. It was my first time rearing and homogenizing fruit flies. I still have flashbacks of my graded exams, there were A LOT of marks. I was thankful for every 1/16th of a point I got.

The field trips in Dr. Pontasch's limnology course were unforgettable, I naturally love jumping into streams and this class really let us do that. There were many firsts in that class as well, first helgramite, first time on a pontoon boot, first time measuring stream flow and collecting organisms from the bottom of stream.

So please keep the newsletters coming and sign me up for any future publications, I enjoy hearing what is going on.

Thanks for the great experiences!"

◆ Nick Goetsch ('00)

"I became a physician because I love people, thinking, learning, and serving others. I also want to make the Cedar Valley a healthier place to live. I came to UNI knowing I wanted to pursue a medical career. I left UNI with Panther blood in my veins and the gut feeling that I would be back. I chose to attend Des Moines University-Osteopathic Medical Center to pursue my dream of becoming a physician. While living in Des Moines, I constantly felt drawn back to the Cedar Valley - the community I love! I served as Chief Resident at the Northeast Iowa Family Medicine Residency Program in Waterloo. I moved on to join Iowa Health System Internal Medicine group before branching off as our own clinic, Waterloo Family Medicine, which I love! In addition, I fill my time with family activities, covering Allen Memorial Hospital Emergency Room, mentoring pre-med/med/ARNP students, volunteering my services at UNI athletic events and at my church, Orchard Hill, which includes leading a weekly high-school small group, and completing coursework for the Iowa Health System Physician Leadership Academy, a master's program in leadership. It was such an honor to be named one of Cedar Valley Business Monthly's 20 Under 40 recipients of 2009. You will usually find me working over lunch, in a valiant effort to determine the next step to improve my patients' health and well-being (and to get home at a decent time)! This work ethic, which I honed during my studies and research at UNI, has served me well, both personally and professionally. Overall, I consider my wife and two sons to be my biggest accomplishments in life - and I can only hope that Panther blood is a dominant trait! My UNI advisor, Ken Nuss, shared a great deal of wisdom with me during my time at UNI which I reflect on to this day."

Let us hear from you. . .

Let us know what you have been up to.
You can email us at david.saunders@uni.edu or return this form to:

Department of Biology
University of Northern Iowa
Cedar Falls, IA 50614-0421

First Name _____ Last Name (maiden) _____

Address _____

City _____ State _____

Email: _____

Please share any news about you or your family to be included in the next Biology Newsletter.

Science Teacher Pays it Forward

Life in teacher-land is demanding in many ways, from the day-to-day teaching to meeting state curricular guidelines to keeping abreast of pedagogy and content knowledge. No one knows this better than someone with over 35 years of teaching experience. This veteran teacher also knows that constant updating is necessary and that there is a real positive in having a day away from school to recharge your teaching and learning batteries.

Warren Bromann knows ALL of this! Warren taught mostly high school biology, though since most of his teaching career was in mid- to small-sized schools he taught the gamut of science subjects at one time or another. Mr. Bromann availed himself of professional development

offered by the University of Northern Iowa science departments by attending content Update Conferences in the late 1980s and throughout much of the 1990s. He enjoyed not only learning about new ideas in science, but also networking with other science teachers. He was a regular at the Biology Update Conferences and missed them when they were discontinued.

Fast-forward a few years to Warren's retirement. He remembered the conferences and felt new science teachers replacing his generation were disadvantaged by not having the Update Conference opportunity. Warren sought to solve that problem by gifting funds to the UNI Foundation in 2010 to sponsor a "Science

Educators Content Symposium", providing support that includes mileage and substitute teacher pay for the participants as well as marketing and materials costs.

The first symposium was held on March 25, 2011, focusing on teaching biological evolution and chemical safety. The second symposium, a Biology Update Conference, will be held this spring on March 30. Warren's intent is to initiate an annual update conference for science teachers. The Biology Department is grateful for the gift that will keep on giving in the form of increased teacher quality. Department faculty are also pleased to respond with conferences that allow us to re-establish networking with biology teachers and to facilitate collegial networking among them.

~ Warren Bromann is truly paying it forward!

Reconnect with the Department of Biology

Whether it has been decades since you were last a UNI student or just last year, we invite you to reconnect with the students, faculty and staff in the Department of Biology and make an impact.

- 1) **Employment opportunities** – Does your company hire biology majors? Full-time positions, part-time positions, summer internships, whatever your needs might be, we'd like to make students aware of the career opportunities available to them with your organization.
- 2) **Job shadowing and informational interviewing** – Many biology majors are at UNI as the first step to their goal of professional or graduate school. In order for them to confirm their interest in their major area of study, we encourage them to job shadow and participate in informational interviews. If you are willing to meet with a student for 30 minutes or half day let us know.
- 3) **Host a student organization** – The Department of Biology has 15 different student organizations who invite professionals to campus to speak to clubs, as well as visits and tours of organizations. If you are willing to speak to a student group, or host a group of students we can connect you with some bright and motivated students hoping to follow your path.
- 4) **Faculty as consultants** – Department of Biology

faculty members are actively engaged in research. If their area of interest matches yours, we can connect you to discuss mutual challenges and strategies. You can find information on faculty research at: http://www.biology.uni.edu/about_facstaff.html

- 5) **Micro contributions** – You may have heard of micro lending or micro financing. The Department of Biology is building on the concept. Biology Alumni funds can be pooled together to make a huge impact with a small donation. We have students in need of scholarship funding, or paid research opportunities which would benefit both the student and faculty members. Now you can contribute to the success of students, faculty and the department by being a part of collective resources. Through UNI Foundation, biology alums can give small amounts that add up to make a big difference! If 100 alums gave \$50 we could fund several undergraduate scholarships or research opportunities and the students would feel an immediate and huge impact.

If any of these opportunities are a fit for you or if you have other ways you'd like to partner with the Department of Biology, please contact Dr. David Saunders at 319-273-2456 or Joan Smothers at joan.smothers@uni.edu or 319-273-2010 as a first step.

Faculty and Staff News

Taiwan exchange program – year one a success!



Biology spent the same four weeks in Taipei, Taiwan, working in the research laboratories in the Institute of Neuroscience and taking a course in Mandarin Chinese. In addition to research and course work, UNI students visited cultural sites and national parks in Taipei and around Taiwan.

The overall experience for the UNI Biology and NCCU students was life changing and the number one comment from each participant was they wanted to stay longer! This summer the program has been expanded to include students majoring in Biology and Psychology and the program will last 6 weeks, from July 1 through August 10th.

The first exchange program between National Chengchi University (NCCU) and the University of Northern Iowa was a rousing success. The concept of the program is that students from each university take language and culture courses and participate in research. Seven students and a faculty member from NCCU came to the UNI campus on July 6 and spent four weeks interacting in the Department of Biology research laboratories and taking classes through the Cultural and Intensive English Program. Eleven students from the Department of



Dr. Steve O’Kane and Dr. John Ophus receive Dean’s Awards

Dr. Steve O’Kane received the 2010-2011 Dean’s Award for Superior Achievement in Research, while Dr. John Ophus received the 2010-2011 Dean’s Award for Superior Teaching in the Liberal Arts Core.

Dr. O’Kane joined the UNI Department of Biology in January of 1996. Steve has been engaged in scholarly activity and his intensity for the pursuit of research knowledge has been relentless, with 35 peer reviewed publications since his arrival at UNI. Steve’s research lab involves both undergraduate and graduate students. Steve has supported his research through a number of small externally funded grants that have totaled over \$50,000 over the past twelve years. In addition, Steve received the 2002-2003 Prem Sahai Distinguished Scholar Award that provided additional funding for his research. Steve’s work is well known and respected throughout the botanical academic community. He has discovered more than a dozen new species of plants in the Mustard family. Because of Steve’s expertise in the Mustard family, in 2009 a newly discovered species of this group found in

Argentina was named *Physaria okanensis* in his honor. Additionally, Steve was recently asked to be the keynote speaker at the Colorado Native Plant Society Annual Meeting, further securing his recognition as an expert in his field.

Dr. John Ophus teaches a number of Liberal Arts Core courses for the Department of Biology, including Life: The Natural World, as well as two other courses that can serve as the liberal arts core for Biology majors (General Biology: Cell Structure and Function), and teaching majors (Inquiry Into Life Science). John’s student evaluations for the past five years have been outstanding and this is particularly telling given that the size of the courses he teaches run from about 50 to 180 students.

John’s goal in the Liberal Arts Core courses is to have students gain an appreciation for Biology and to diminish their “fear” of science. From John’s student evaluations, it would seem that most of the students with whom he comes into contact in these courses have indeed gained an appreciation and comfort level with Biology.

Faculty and Staff News (Continued)

Field Research in the Northern Gulf of Mexico



During June and July 2011, Dr. Carl Thurman and three undergraduate field assistants (Kelsey Hampton, Morgan Rilling, and Janelle Woodin) travelled over 4000 miles to collect fiddler crabs along the shore of the northern Gulf of Mexico (GOM). During their expedition, they collected fiddler crabs and soil samples at 40 locations over a 500 mile span of

coast between Gulf Co., Florida and Galveston Bay, Texas. On the trip, they encountered a total of seven species of fiddler crabs. In addition they collected habitat water, soil, and “tar ball” samples at sites where the

crabs were found. The group produced 25 new distribution records.

Upon return to UNI, the crab catch, soil, and tissues were sorted, preserved, and stored. Some soil samples and “tar balls” were analyzed by Morgan Rilling and Dr. John Bumpus (UNI Chemistry & Biochemistry) for hydrocar-

bon content using gas chromatography. Crude oil from the 1989 Exxon Valdez spill was used as a standard to identify hydrocarbon residues.

While on the three-week field expedition, Dr. Thurman gave seminars about his research at The Gulf Coast Research

Laboratory, Ocean Springs, MS, Texas A&M University-Galveston, Texas A&M - College Station, and The Natural History Museum, University of Kansas. Janelle Woodin and Morgan Rilling gave poster

presentations about their work in the GOM at the UNI Summer Undergraduate Research Symposium.



Biology receives grant from Roy J. Carver Charitable Trust

The Department of Biology received \$358,502 from the Roy J. Carver Charitable Trust to support a Microscopy and Image Analysis Facility. Funds will be used to purchase three specialized microscopes and the associated image analysis equipment so that our students are exposed to modern biological techniques and are able to remain current and competitive in their chosen disciplines. A high quality fluorescence stereomicroscope and imaging system will be used for the detection of fluorescent probes in living specimens such as leaves and other plant and animal tissues. The resolution available will be sufficient to detect these probes in individual cells. For example, a biotechnology student could use this microscope to screen plant tissues to determine whether or not a gene of interest has been inserted successfully.

A high quality fluorescence compound microscope and imaging system will be used when greater magnification is required, such as the visualization of chromosomes. Both of these instruments will improve on existing facilities, providing enhanced image quality and increased availability.

A confocal microscope and imaging system, considered standard instrumentation in biological research, will also now be available at UNI. The advantages of this technology include the ability to optically section a specimen instead of having to prepare multiple, fixed thin sections manually, which are then viewed separately, as well as the capability to image both living and fixed specimens. The greatest benefits associated with confocal microscopy, however, are related to its uses with fluorescently labeled specimens.

Dr. Peter Berendzen receives State Wildlife Grant

Dr. Peter (Pete) Berendzen received a State Wildlife Grant (SWG), funding which is appropriated by the United States Congress for state non-game wildlife programs. This funding is granted for projects relating to species of greatest conservation need identified in Iowa's Wildlife Action Plan. The focus of the project is to use a multidisciplinary approach to provide the necessary information for better conservation of two species of native fishes in northeast Iowa. The study combines genetic and habitat data with ecological niche modeling to establish a framework for conservation efforts for *Moxostoma duquesnei* (black redhorse) and *Rhinichthys cataractae* (long-nose dace).

Faculty and Staff News (Continued)

Seed Grants from the UNI-Office of Sponsored Research

Dr. Carl Thurman (UNI), Dr. Peter Berendzen (UNI) and Dr. Melanie J. Hopkins (Field Museum of Natural History, Chicago) received a seed grant of \$15,000 from the Office of Sponsored Research. The study, entitled “Impact of an Oil Spill on Diversity in Keystone Coastal Species from the Gulf of Mexico”, proposed to examine the impact of the 2010 Deepwater Horizon oil spill on the diversity of fiddler crab species along the coast of the northern Gulf of Mexico. Since fiddler crabs are important for the health of coastal habitats, the award was granted to initiate a study of the recovery of the shores between Port St. Joe, Florida and Christmas Bay, Texas, one year after capping the well. For measures of diversity, the investigators are assessing species, morphological and genetic diversity both before and after the spill.

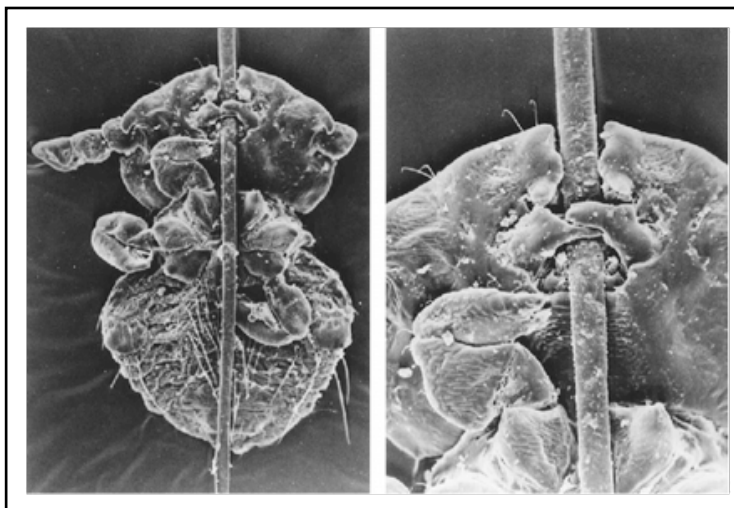
Dr. David McClenahan’s lab is currently using the Office of Sponsored Program’s Seed Grant money to measure the specificity of several P2X₇ receptor antagonists against the bovine P2X₇ receptor. This receptor is an adenosine-5'-triphosphate (ATP) -activated ion channel that, when activated, will allow movement of Ca²⁺ and other ions between the extracellular space and cytoplasm of a cell. It is Dr. McClenahan’s hypothesis that extracellular ATP, acting via the P2X₇ receptor, modulates some of the changes associated with lung function during the early stages of the bovine respiratory disease complex. Dr. McClenahan and his students are presently looking at the link between permeability changes in bovine lung epithelial cells and elevated levels of extracellular ATP. To determine whether

this link actually exists, a method to specifically block the interaction of ATP with this receptor is needed. Unfortunately, the older P2X₇ receptor antagonists were not specific for just this receptor, and thus, results using these antagonists were not always accurate or straightforward. Several newer antagonists have been introduced over the last several years that are very specific for the receptor in several animal species, but none of them had been tested against the bovine variant of the P2X₇ receptor. Dr. McClenahan’s current research involves determining the suitability of these newer antagonists for this purpose.

Dr. Jim Demastes and Dr. Theresa Spradling are using their seed grant to extend their 20-year study of a rapidly changing biological contact zone in a unique geological setting along the Rio Grande Rift Valley. Their past studies have shown that the geographic range of a mammalian parasite, a chewing louse species that lives on pocket gophers, has been expanding southward at a constant rate since 1929. Populations along the leading edge of an expanding range are of interest to people who study evolution, genetics, and past and present climate change. Chewing lice are particularly interesting insects, because they have coevolved with their mammalian hosts for several mil-

lion years. Funding from the seed grant makes possible preliminary field work and development of specialized genetic tools

UNI students are involved in this work. Sheree Harper’s master’s degree research focuses on the genetics of populations of a second species of chewing louse in this same geographic region. This November, she conducted field work in New Mexico with Jim and Theresa and was very successful in collecting specimens needed for her thesis. Biology undergraduate students, Courtney Calhoun and Alex Poppinga, are gaining research experience and are providing valuable help sorting lice under the microscope and extracting louse DNA. Preliminary data are promising and will be used to submit a proposal for long-term study of both chewing louse species to the National Science Foundation in January 2012.



The star of the show: A chewing louse grasping a pocket gopher hair (mouth parts shown in close-up on right).

for DNA fingerprinting, which will allow the first fine-scale examination of louse population dynamics.

Focus on UNI Biology Students

◆ **Kelsey Hampton** will present her work on “Intra- and Inter-specific Variations of Carapace Shape in Brazilian Fiddler Crabs (genus *Uca*),” at the National Conference on Undergraduate Research (NCUR) at Weber State University in Ogden, Utah, March 29-31. This is a study she has undertaken with colleagues at UNI, the Chicago Field Museum, and the Universidade de Sao Paulo. Kelsey has been analyzing the shape of the carapace in various *Uca* species across their geographic range along the Brazilian coastline. She has prepared 2500 photos for geometric analysis by overlaying 23 ‘landmarks’ on each, and has succeeded in completely analyzing the spatial relationships among these landmarks in four of the ten species.

The College of Humanities, Arts, and Sciences (CHAS) will sponsor Kelsey as she presents her original work. She was nominated by CHAS faculty who submitted letters of nomination extolling the merits of each student’s work and demonstrating its significance to existing and emerging research and scholarship in the student’s disciplinary field. Kelsey was selected from among 3,190 students who applied to the NCUR, and will travel to Utah this spring.

◆ **Susan Meerdink** has been selected as NASA Scholarship recipient at the University of Northern Iowa by the Iowa Space Grant Consortium (ISGC). Her research is titled “Taimyr Wild Reindeer Spatial Fidelity and Calving Grounds Dynamics in a Changing Climate”. Reindeer herds return to specific areas to calve each year with slight variations in location. The focus of Susan’s research is to determine how climatic parameters affect the year to year variability of calving grounds for reindeer in Taimyr, Russia. She will orally present the research at the Association of American Geographers Annual conference in New York City and the International Polar Year Conference in Montreal, Canada in the spring of 2012. This research project will culminate in Susan’s senior thesis and a publication in a peer reviewed journal.

◆ **Jack Kosmicki** once again received an internship with the Harvard-MIT Bioinformatics and Integrative Genomics (BIG) Health Sciences and Technology Summer Internship Program. Jack worked with Dr. Dennis Wall at the Center for Biomedical Informatics in the Harvard Medical School. While there, Jack worked with the Autism Diagnostic Observation Schedule-Generic (ADOS-G), one of the most widely used instruments for pre-diagnosis of autism. Unfortunately, children may wait as long as 13 months between an initial screening and diagnosis using current diagnostic tools. Jack worked on creating a shortened and readily accessible diagnostic exam that could improve on this time frame. He tested 16 different machine learning algorithms to construct a classifier out of the set of scores from the first module of the ADOS-G, and found that the alternating decision tree algorithm performed the best. His analysis indicated that 8 of the 29 items contained in the first module of the ADOS-G could diagnose autism with 100 percent statistical accuracy. Using just the 8 items would reduce the time needed to administer the test and speed up the diagnosis process. Jack and his team are currently summarizing

this research in a manuscript they plan to submit to Translational Psychiatry and Jack will be listed as the first author on this paper.

◆ **Jim Mason, Jarrett Pfrimmer, Ben Hoskch, and Drew Miller**

Will biofuel cropping systems using native prairie vegetation provide high-quality habitat for Iowa wildlife? This is the fundamental question being addressed by students working with Dr. Mark Myers on UNI’s Prairie Power Project. Master’s students Jim Mason and Jarrett Pfrimmer have been studying bird habitat use and community characteristics at an experimental prairie biomass production site in Black Hawk County since 2009. The pair have documented significantly greater bird abundance and diversity in high-diversity, forb-rich plots compared those comprised of low-diversity, grass-dominated plant communities. In 2011, Jarrett documented three grassland birds classified as “species of greatest conservation need” in Iowa successfully nesting in the biomass production plots. In May, Jim, a two-time recipient of the Myrle Burk Ornithology scholarship, presented his research at NatureServe’s Biodiversity Without Boundaries 2011 Conference in Nebraska City, Nebraska.

Undergraduate students Ben Hoskch and Drew Miller diligently monitored butterfly and plant community characteristics at the site while participating in the Department’s Summer Undergraduate Research Program. Ben and Jim are co-authors of a recent article published in Journal of Insect Conservation detailing this work. These students have been supported by funding from the Iowa Power Fund through UNI’s Tallgrass Prairie Center, the Iowa Science Foundation, and UNI’s Graduate College and Department of Biology.

◆ **Alex Poppinga** This summer Biology major Alex Poppinga will be conducting research thousands of feet above ground, from a special laboratory onboard NASA’s P-3 Orion. The P-3 aircraft was designed for studying Earth system processes such as atmospheric chemistry and oceanography, as well as satellite calibration/validation. Alex will be based in Palmdale, California, at NASA’s Dryden Aircraft Operations Facility, where the various research topics available to her include: evapotranspiration in the San Joaquin Valley, anthropogenic pollution in the Los Angeles basin, and remote sensing of the coastal ocean and near shore processes. To collect airborne data, Alex will be trained in the operation of the P-3 aircraft’s instruments, as well as the sampling and measuring of atmospheric gases and imaging land and water surfaces. She will develop her own, individual research project from the data collected and perform sample analyses in collaboration with faculty from the University of California at Irvine. At the end of the program, Alex will give a formal presentation on her research, which will be videotaped for future use by researchers and other interns. Alex is very excited for this opportunity to explore a fascinating avenue of science! We are very proud of Alex and happy to see our student continue to soar to new heights!

Student Clubs

Pre-Med Club



The Pre-Med Club tour Allen Memorial Hospital in Waterloo.

Pre-Med Club is one of the fifteen clubs available to students in UNI's Department of Biology. The mission of the Pre-Med Club (PMC) is to provide students interested in a career in medicine with a peer group that offers information, advice, support, speakers and social activities. It promotes members to take an active step in their pre-med education and participation in extracurricular activities in order for them to have the best opportunity to enter into medical school. The club holds monthly meetings in which local physicians and current medical students are invited to share their experiences in the field of medicine. Additionally, admissions representatives from medical schools are invited to club meetings to describe their program and explain their admission requirements.

One of the main goals of PMC is to distinguish and expose pre-med students to the two types of medical programs in the United States: allopathic medical (M.D.) programs and osteopathic medical (D.O.) programs.

In Fall 2011, PMC offered pre-med students many interesting events and activities. At the September PMC meeting, a local orthopedic surgeon shared his unusual and exhilarating stories

BIOLOGY CLUBS

- Biotechnology Club
- Microbiology Club
- Pre-Chiropractic Club
- Pre-Dental Club
- Pre-Medical Club
- Pre-Mortuary/Forensic Science Club
- Pre-Occupational Therapy Club
- Pre-Optometry Club
- Pre-Pharmacy Club
- Pre-Physical Therapy Club
- Pre-Physician Assistant Club
- Pre-Vet Club
- Student Nature Society
- Students for Organ Donation
- Tri-Beta (Beta Beta Beta)

from medical school and residency and presented advice for the PMC members. In October, PMC members traveled to Iowa City to attend the 63rd Annual Pre-Med Conference held by the University of Iowa. Members enjoyed listening to keynote speakers talk about admission requirements, witnessing a demonstration in cyber anatomy, and interacting with current UI med students during lunch. In November, PMC members took a trip to Des Moines University. There they toured DMU's campus, watched Osteopathic Manual Medicine OMM demonstrations performed by current DMU students, and visited the simulated operating room lab.

In Spring 2012, PMC plans to have other local physicians and med students speak at their monthly meetings. One exciting event this spring was a tour of Allen Memorial Hospital in Waterloo. The tour included special visits to the laboratory, operating room, and emergency department.

The club welcomes support from local physicians and alumni, particularly as guest speakers for their meetings. If you have a desire to be a guest speaker or want to learn more about the club, please contact president Jim Feimster at feimstej@uni.edu.

Student Nature Society Award

The Student Nature Society was named the University of Northern Iowa's Student Organization of the Year for 2010-2011. This award is designed to recognize a student organization that has excelled and exemplified outstanding service, dedication, and leadership to their members, University of Northern Iowa and the community. The Student Nature Society is a university sponsored biology club. The group focuses on exposing students to the natural world through volunteer work and nature-based activities and field trips. The club's feature events on campus include



Susan Meerdink, former president of the Student Nature Society received the award for UNI's Student Organization of the year.

the 5K Run for the Preserves, Annual Plant Sale, and Darwin Week activities. Earth Day activities are another way SNS members interact with others in the community and on campus. On campus the group works with the Center for Energy and Environmental Education, the Botanical Center, UNI student groups, the Recycling and Reuse Technology Transfer Center, and the Tallgrass Prairie Center. The group also works with the Black Hawk County Conservation Board, Hartman Reserve, Black Hawk Wildlife Rehabilitation and others.

New Faculty/Staff

❖ Mark Sherrard

The Department of Biology is pleased to welcome its newest faculty member, Dr. Mark Sherrard.



Mark earned his Ph.D. in Integrative Biology in 2010 from the University of Guelph in Guelph, Ontario, Canada. His research at Guelph focused on the underlying causes of plant physiological variation. In particular, Mark was interested in whether nutrient availability, water availability, and biotic soil factors

influence the strength of natural selection on plant photosynthetic traits. After his dissertation, Mark took a Post-Doctoral research position at Duke University where he studied variation in water transport of deep versus shallow tree roots, using live oak trees in Central Texas as a model system.

In addition to research, Mark is also passionate about teaching. At Guelph he was a Teaching Assistant for nine courses. He just finished his first semester here at UNI, where he taught Ecology and Organismal Diversity Lab. He is excited for the Spring semester, in which he is teaching Plant Physiology and will mentor an undergraduate student in a summer research project.

❖ Kim Cline-Brown

Dr. Kimberly Cline-Brown has been promoted to Instructor in Biology. She brings with her over fifteen years of university teaching experience. Dr. Cline-Brown earned her Ph.D. with distinction in 2004 in Biology from the University of New Mexico. There she studied behavioral biology and taught human cadaver laboratories at the medical school. Her dissertation research took an interdisciplinary approach to the study and treatment of Major Depressive Disorder. In addition, Dr. Cline-Brown did a clinical internship with



the Mississippi Department of Health to gain out of class experiences with physical and mental health issues.

Prior to coming to UNI, Dr. Cline-Brown spent several years doing research and clinical drug trials for several major pharmaceutical companies with researchers associated with George Washington and Johns Hopkins Universities.

Dr. Cline-Brown has a passion for teaching and has mentored several UNI students as well as co-authored a lab manual with Dr. Steve O'Kane. She is excited to continue using her interdisciplinary and real world experiences to inspire undergraduates at UNI to learn about and interact with aspects of biology.

❖ Joan Smothers

Joan Smothers recently joined the department as the new academic advisor for over 700 biology majors. Joan comes to us after almost seven years at UNI. Most recently she was the Assistant Director of Undergraduate Programs in the College of Business Administration. Prior to that, she worked as an Assistant Director with UNI Career Services developing relationships with local, state and regional employers that hire UNI students full-time



and as interns or cooperative education students. Joan has also worked at the University of Wisconsin-Milwaukee in the College of Engineering and Applied Science and Iowa State University in the Department of Residence. Her wide range of experiences in student affairs makes her an asset for our students.

Joan will continue the tradition of working with students to meet their academic and career goals while graduating in a timely manner. She does that by working with students to create plans of study and educating students on how to read their advisement report and understanding graduation requirements. This also gives Joan the opportunity to get to know students' interests and therefore make them aware of internship and employment opportunities, graduate and professional school requirements and processes, as well as opportunities to participate in campus activities such as study abroad. If you, or someone you know, are interested in learning more about the Biology majors at UNI or interested hiring a Biology student as an internship/co-op or new employee, please feel free to contact Joan at: joan.smothers@uni.edu or 319-273-2010.

New Biology Undergraduate Research Fund

Undergraduate student research has been part of UNI's mission for 30 years and our program is as rigorous as any at a public university or private liberal arts college in the United States. Our faculty are eager to work with our students because they know that the complete scientific process of a true research experience cannot be fully replicated in the classroom.

Our department offers research opportunities across a wide breadth of areas that prepare students for careers in biomedical science, ecology, science education, biotechnology, plant biology, and microbiology. Student researchers regularly publish in scientific journals and present at regional and national conferences. Sixty percent of our students go to graduate/professional school – an undergraduate research experience figures prominently in their acceptance success.

However, student interest in conducting undergraduate research outstrips available funding and just a lucky few receive financial assistance. Since more than 75 percent of our students graduate with debt averaging \$25,000 per student, many of our students also have part-time jobs to reduce their debt load and pay college expenses. Taking on a research project represents a significant time commitment for our students – time they might otherwise devote to part-time employment. So, increasing the financial support for our researchers has become a priority.

Last December, UNI Biology faculty made personal commitments to begin a new fund in the department. The new Biology Alumni & Faculty Undergraduate Research Fund will provide some funding for our students in the form of stipends, covering expenses related to research

materials and preparing presentations, and travel to research conferences. A full undergraduate research assistantship is \$3,000 and there are generous alumni who fund full assistantships – but all levels of assistance are helpful. In fact, you may have received a letter recently from Dr. Robert and Brenda Good, '74 alums who would like you to consider joining them in funding undergraduate research.

If you would like to help make an impact on the future of our young scientists, consider a gift to the new Biology Alumni & Faculty Undergraduate Research Fund or the possibility of creating a fully funded assistantship. Your support makes a difference. For more information contact Cassie Luze at cassie.luze@uni.edu or 319-273-6360.

Swanson Award Supports Research, New Scholarships



Many of our alumni support the department each year, and we are grateful for the loyal generosity. Drs. David ('86) and Cathy Swanson of Iowa City have supported an annual \$1,000 research award for many years. Each year the award is given to a student whose research is in the area of genetics. David is

an anesthesiologist on the medical staff and faculty at the University of Iowa and Cathy's background is in family medicine. As physicians they know what an important educational experience research is, particularly for our students who are going into biomedical careers.

New Funding

Dr. Joan ('72) and Dan Meyer of Escondido, CA, have begun funding the new Dr. Joan and Dan Meyer Biology Scholarship. Joan has a podiatry practice in Escondido and Dan is a nurse anesthesiologist at the area veterans' hospital. Joan feels her undergraduate experience at UNI well prepared her for the rigors of medical school and practice and they are providing the \$1,000 annual scholarship to help reduce student debt and encourage students in science careers.

Dr. Eric ('59) and Alyse ('58) Streitberger of Fullerton, CA dedicated their careers to education. Eric is a retired Professor of Science Education at California State University and is currently on the faculty of the Osher Lifelong Learning Institute at California State University. Alyse is a retired elementary educator. To honor their careers in education, their nephew Dr. Randy Ryker, on the faculty at Nicholls State University in Thibodaux, LA, has recently begun funding the Streitberger/Mohr Science Education Scholarship through the Ryker Family Trust. The new scholarship will benefit UNI students from the State of Iowa who intend to be middle grades through secondary science educators.

YOU CAN MAKE A DIFFERENCE!

We take much pride in the accomplishments of our students and we hope that we have played some role in their success. We take very seriously our responsibility to educate and provide opportunities to our students and we are continually looking for ways to improve. With each passing year this has become increasingly difficult. Our Departmental budget has not seen an increase in the past twelve years. Yet the costs of equipment, supplies, and travel have continued to rise. Our faculty have attempted to meet these challenges and have found ways to support students and provide students with opportunities by obtaining external funds. However, this too has become more difficult.

The cost to students continues to rise through increased tuition coupled with fewer opportunities available to students via University-sponsored programs. It

now costs the average student more than \$25,000 per year to attend UNI. Most of our students work outside of the University to support themselves and to pay for tuition. This in turn can impede their education and reduce their time for experiential learning. Although working while attending school can benefit students in learning time management skills, it may also defeat the purpose of attending a university and taking part in all that it can offer.

The financial support of many of our alumni help to provide what would otherwise be lost opportunities to our students. Many of the student scholarships that are offered via private funds have the caveat that students must work within the Department in order to receive scholarship funds. This is a wonderful idea as it requires the students to participate in our Department and we hope this, in turn, stimulates

the students to think of our Department as their home away from home. It provides faculty the opportunity to better know our students and provides our students the opportunity to interact with faculty, a win-win situation for both. Unfortunately, we have too few of these scholarship opportunities available for our students. Your financial support of existing scholarships or the endowment of new scholarships would ensure that our students today receive the same opportunities that were afforded to you. This is a legacy worth leaving. Your financial support of student scholarships and the Department as a whole would be much appreciated. Listed below are the current scholarship funds available for students as well as the Department's Biology fund which supports student/faculty research.

Scholarships and Funding

◆ **Biology Alumni & Faculty Undergraduate Research Fund**

This fund is to be used for general undergraduate support such as but not limited to a partial student award/stipend, research or presentation related expenses, research conference travel, etc.

◆ **Biology Awards & Honors**

This fund is used to support "hard working" students who do not have any other financial assistance. Biology faculty nominate deserving students.

◆ **Biology Department Fund**

This fund is for general support for the Department of Biology. Monies from this account are used to support faculty/student research, faculty/student travel, and purchase of teaching supplies and equipment.

◆ **Biology Preserves Fund**

This fund is used to support the development and maintenance of the Biological Preserves System at UNI, including such items as purchase of trees, shrubs, and equipment as well as for the development of exhibit areas and support of personnel involved.

◆ **Caroline Czarnecki Biological Sciences Scholarship**

This scholarship provides support for students who demonstrate merit and financial need, with preference given to students with a declared major in biological sciences, with a grade point

average of at least 3.0. The award amount is \$1000.

◆ **Myra and Gary Floyd Undergraduate Research Assistantship**

This assistantship is to provide support for two undergraduate research students in the Department of Biology.

◆ **Vivian Wiseman Fullmer Scholarship**

This scholarship is awarded to undergraduates who have a major or emphasis in an environmentally focused undergraduate program. Students must have financial need, scholarship, and professional dedication. The amount of the award is \$300.

◆ **Dr. and Mrs. Robert Good Summer Research Fellowship**

This fellowship is intended to support undergraduate student research carried out through the summer. The fellowship provides \$3000 for the support of an undergraduate research project.

◆ **Dr. Timothy Greiner Undergraduate Biology Scholarship**

This scholarship provides support to undergraduate biology majors who are in no less than their second semester of their major. The award amount is \$1000.

◆ **J.S. Latta Biology Scholarship**

This scholarship provides support for a declared biology major, either a freshman or sophomore having either completed or currently enrolled in both Organismal Diversity and Cell Structure and

Function. The student must have GPA of 3.5 or higher. The amount of the award is between \$250 and \$500.

◆ **Dr. Joan and Dan Meyer Biology Scholarship**

This scholarship supports students who demonstrate merit and financial need with preferences given to students with a declared major in Biology, with a grade point average of at least 3.2.

◆ **Dr. Alan R. Orr Research Awards Endowment Fund**

This award supports undergraduate experiential learning through hypothesis-driven research. Applicants must be Biology majors with a grade point average of at least 3.2 and conducting research with a faculty member in the Biology Department.

◆ **Bear and Sandy Stevens Family Endowed Biology Education Scholarship**

This scholarship supports students who demonstrate merit and financial need with preference given to students with a declared major in Biology Teaching, with a grade point average of at least 3.0.

◆ **Dr. Dave Swanson Research Award**

This award supports undergraduate experiential learning through hypothesis-driven research. Applicants must be Biology majors conducting research with a faculty member in the Biology Department.

Support for students or department

Would you like to support a Biology student and/or the Biology Department?
If so, please fill out the form below and return it to:

UNI Foundation Financial Services

1223 W. 22nd Street
Cedar Falls, IA 50614-0239

If you would like to start your own scholarship, contact Cassie Luze
cassie.luze@uni.edu or Phone: 319-273-6360

Name _____

Address _____

City _____ State _____ Zip _____

E-mail: _____ Phone _____ Is this a cell phone _____

Please check if new address, phone or email.

I/we would like to support the following fund(s)

- \$ _____ Biology Alumni & Faculty Research Fund (21-222596)
- \$ _____ Biology Department Fund which includes Dr. David Swanson Research Award (21-221607)
- \$ _____ Biology Awards & Honors (21-210342)
- \$ _____ Biological Preserves Fund (21-220162)
- \$ _____ Caroline Czarnecki Biological Sciences Scholarship (21-212250)
- \$ _____ Vivian Wiseman Fullmer Scholarship (21-210232)
- \$ _____ Myrna & Gary Floyd Undergraduate Research Assistantship (21-222165)
- \$ _____ Dr. and Mrs. Robert Good Summer Research Fellowship (21-222342)
- \$ _____ Dr. Timothy Greiner Undergraduate Biology Scholarship (21-212261)
- \$ _____ J.S. Latta Quasi-Endowed Biology Scholarship (20-210303)
- \$ _____ Dr. Alan R. Orr Research Awards Fund (21-211914)
- \$ _____ Total

Online

Go to the online pledge form at www.uni-foundation.org/ and click on "Make an online gift". You will need to enter the specific name(s) of the Biology projects in the "Other" box near the bottom of the web form.

Matching Gifts: My (or my spouse's) company, _____ (name) will match my gift. Please contact your HR office for details and the matching gift form to be submitted with your payment.

Check

Check enclosed, payable to the UNI Foundation

Credit Card

Credit Card: Please charge my card \$ _____ beginning (mo/yr) _____ / _____

Signature (required) _____ Date _____

Credit card information will not be kept on file.

100415

Charge my: VISA MasterCard Discover American Express (circle one)

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Department of Biology

University of Northern Iowa
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Contact info:

David Saunders
Department Head
319-273-2456



Fall Garden at the Botanical Center
Photo by Billie Hemmer

Web info: <http://www.biology@uni.edu/>

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