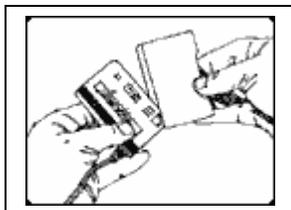


Credit Card Protector

Enclosed is a credit card protector. Place the bottom of your credit card in the tray with the magnetic strip to the back, then push the card so the back goes against the protector. When you need to use the card just pull at the top and you can swipe



your card without removing it from the protector.

We have conveniently ☺ provided the graduate program contact information on the protector so you can refer prospective students

who are interested in pursuing training and education in toxicology.

Toxicology Faculty News

George Kraus and John Verkade, both University Professors of Chemistry, discovered that adding calcium nitrate to anhydrous ammonia tanks makes the corn fertilizer useless as an ingredient for methamphetamine.

The ISU chemists and their team of graduate students discovered a way to make anhydrous ammonia fertilizer useless. When the calcium nitrate is added the yield of meth drops from 42% to 2% or less. Verkade said the two had tested "dozens and dozens" of compounds before finding one that worked. (ISU News Service by Mike Krapfl)

Diane Birt, FSHN, was a member of the NIH State-of-the-Science Panel on Multivitamin/Mineral Supplements and Chronic Disease. Conference held at NIH, Bethesda MD, May 15-17, 2006. She was awarded the Central States Society of Toxicology John Doull Award on October 6, 2006 in Kansas City, MO. Her talk was entitled "Understanding bioactivity of complex mixtures using Echinacea and Hypericum." Diane was appointed to a three year

Toxicology News 2006

Iowa State University

Our best holiday wishes to you

term on the Food and Nutrition Board of the Institute of Medicine, National Academies of Science.

Steve Ensley, DVM, Ph.D. (Ph.D./Carson) has after toxicology positions with the University of Nebraska and Bayer Corporation Steve returned to the Iowa State University, College of Veterinary Medicine, Veterinary Diagnostic Lab. His job description involves clinical toxicology with a focus on the biofuels byproducts industry. The explosion in the biofuels industry in Iowa has resulted in many questions about the health of animals consuming biofuels co-products. This is an exciting time to be in Iowa.

Suzanne Hendrich, FSHN, participated in several running races this year. She came in 1st in her age category for the YWCA Ames-ISU 2nd annual race against racism 5K.

"Understanding Mycotoxins" the cover story of the June issue of Food Technology featured an Institute of Food Technologists' scientific status summary to update readers on the science of fungal toxins and knowledge of mycotoxins in food. The summary was written by **Pat Murphy**, **Suzanne Hendrich** and Ph.D. student **Cindy Langren** in ISU's Department of Food Science and Human Nutrition.

Gary Munkvold, Plant Pathology, was appointed as Seed Science Endowed Chair. Munkvold will lead a research, outreach and teaching program in seed health in the department of plant pathology and the Seed Science Center. "Dr. Munkvold has an outstanding record in seed pathology in both the public and private sectors," said Manjit Misra, director of the Seed Science Center. "His groundbreaking research answered many longstanding questions critical to seedborne disease in field crops. He is ideally suited to lead the center's seed health program." Munkvold was a plant pathology faculty member at Iowa State from 1993

through 2002, with research and extension responsibilities for diseases of agronomic crops. His research focused on the transmission of important seedborne pathogens and the reduction of mycotoxins (toxin produced by a fungus) in foods and feeds. He also contributed significantly to understanding the benefits of plant biotechnology in reducing the risk of diseases and mycotoxins in corn. Gary left ISU in 2003 to be the research coordinator for the Pathology, Entomology and Seed Science Group at Pioneer Hi Bred International Inc., Johnston. He had global responsibilities for coordinating and improving disease and insect resistance evaluation of Pioneer corn hybrids. We are happy to have him back! (Teggi Barron, ISU News Service, Oct 2006)

Gary will be doing research and teaching in the area of seed pathology at Iowa State. His research will focus on assessing the risks associated with seedborne pathogens and developing methods to



manage diseases that affect seed production and seed quality in a variety of crops. Other projects will include evaluating the impacts of biotechnology on diseases of agronomic crops. He has re-joined the Toxicology faculty and will renew his

previous research activities on the development of toxigenic fungi and their mycotoxins in corn and corn products, including ethanol co-products.

Jacek A. Koziel, Agriculture and Biosystems Engineering, has been researching the “stinky needles” in the chemical ‘haystack’ of livestock odor. A typical air sample collected near a livestock operation “is extremely complex” containing “hundreds if not thousands of chemicals.” Relatively little is known about the olfactory impact of specific odorants downwind from these operations. They are matching the chemical composition of air samples with the odor impact of specific compounds by employing solid-phase microextraction to capture the chemicals.

Dr. Koziel is also researching how to “easily, and cheaply, turn fuel ethanol into food-grade alcohol to be used in beverages, pharmaceuticals and personal care products”. (Ames Tribune/Amy Lorentzen)

The issue is price and their aim is to purify the ethanol at less than a penny per gallon.

Joel Coats, Entomology, has received the International Award for Research in Agrochemicals. A one-day symposium in honor of Coats was held March 27, 2006, in Atlanta, GA, at the American Chemical Society National Meeting and Exposition. The symposium included topics on natural products and environmental toxicology.

Arthi Kanthasamy, Assistant Professor, joined the Department of Biomedical Sciences. She received her Ph.D. in Medical Chemistry and Molecular Pharmacology at Purdue University. Dr. Kanthasamy's research focuses in areas of stroke, drug abuse and Parkinson's Disease. Recently, she received a NIH grant to study neurodegenerative mechanisms in cell culture and animal models of stroke. Further information on her research: http://www.vetmed.iastate.edu/faculty_staff/profiles/arthik.asp

Awards for the ISU Campus

Thomas Gaines, in *The Campus as a Work of Art* (1991), proclaimed the Iowa State campus to be one of the twenty-five most beautiful campuses in the country. Gaines noted the park-like expanse of central campus, and the use of trees and shrubbery to draw together Iowa State's varied building architecture. In 1999, a national landscape architects' group selected Iowa State's central campus as a “medallion” site. The park-like central lawn was among three central campuses selected for special recognition by the American Society of Landscape Architects (ASLA). To commemorate its centennial, the ASLA selected more than 300 significant landscapes across the country as medallion sites. Thirteen sites were on college campuses, but only three are central campus sites—Yale University, the University of Virginia, and Iowa State. Iowa State's central campus includes 490 acres of trees, plants, and classically designed buildings. The landscape's most dominant feature is the 20-acre central lawn. Over decades, campus buildings, including the Campanile, Beardshear Hall, and Curtiss Hall, circled and preserved the central lawn, creating a space where students study, relax, and socialize.

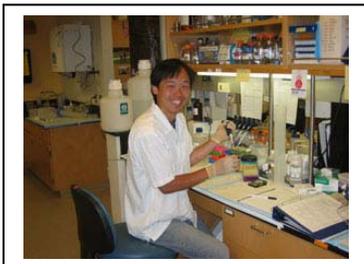
Alumni Updates

We want to thank everyone who sent in information for this section. We really enjoy hearing from you.

Nathan Pechacek (M.S./Hoyle) accepted in 2005 a toxicologist position with 3M Corporation in St. Paul, Minnesota. As a toxicologist for 3M, Nathan prepares risk/hazard assessments for raw materials as well as experimental, intermediate, and finished products for a diverse group of business units within 3M. In addition, he also places and subsequently reviews contract laboratory toxicology studies. Lastly, Nathan provides support and guidance on several issues relevant to regulatory toxicology. This past fall Nathan was certified as a Diplomate of the American Board of Toxicology. Nathan currently lives in Hudson, WI with his wife Kate and two daughters, Neve and Claire.

Kelly Wilhelms (Ph.D./Scanes/Anderson) is a Captain in the U.S. Army and is currently stationed at William Beaumont Army Medical Center in El Paso, TX. He holds the position as Chief, Core Laboratory which is responsible for the Blood Gas, Chemistry (including Toxicology), Coagulation, Hematology and Urinalysis sections within the hospital laboratory. In addition, he holds the position as Chief, Quality Assurance for the Department of Pathology. His largest achievement to date is the successful implementation of the first full chemistry automation line in a Department of the Army MEDCEN. This system is expected to save in excess of 3 million dollars over 5 years in personnel alone. When time permits, he performs limited clinical laboratory research focusing on improvements and verification of clinical laboratory procedures employed at WBAMC.

Masashi Kitazawa's (Ph.D./Kanthasamy) primary research focus is finding the pathogenesis of inclusion body myositis (IBM), and in particular investigating the role of inflammation. Mainly, they use an in vivo system (transgenic mice). This is not in



the area of toxicology, but he believes that IBM may share some common pathogenic mechanisms with Alzheimer's Disease. Masashi is in the LaFerla Lab at University of California-Irvine.

Chuan Shen (Ph.D./Powell-Coffman Lab) is working as a postdoctoral fellow in the Department of Medical Oncology at the Dana-Farber Cancer Institute of Harvard Medical School in Boston. Her research project focuses on understanding the molecular mechanisms underlying the tumorigenesis of renal carcinoma cancer.

Daniel Symonik "Looking back, I am probably a good example of how a Tox degree can lead to a wide range of professional opportunities. After getting my MS in Tox and in Fisheries Biology in 1987 from Drs. Coats and Atchison (man, can it really be almost 20 years!?) I moved out to Utah to become the staff toxicologist for the Department of Environmental Quality. My primary job duties were in assessing risks and setting cleanup standards at Superfund sites. In 1993 I accepted a position at the Minnesota Department of Health doing assessments and consultations on hazardous waste sites. After taking a few years off to complete my field work for a PhD with Dr. Swackhamer at the U of MN studying toxaphene in the Great Lakes, (getting an intact sediment sample from 1200 feet in Lake Superior is no small trick) I returned to a Supervisory position at MDH."



"My current position coordinates the blood lead surveillance and prevention program and the newly created birth defects information system. These systems use population based data and epidemiological methods to develop public health guidelines, implement prevention strategies, and promulgate needed policy. My career has come a long way from counting fathead minnows in the old Entomology Building, but my roots at ISU have served me well over the years. Yes, in fact, I did cheer the Cyclones when they beat the Gophers in basketball this fall...."

David Featherstone (M.S./Drewes/Coats). "After graduating with an M.S. from ISU's Toxicology program, I planned to join the Peace Corps, where I thought my aquatic neurotoxicology expertise might

be useful. Instead I moved to Hawaii with my then-girlfriend-now-wife Janet Richmond. There, I applied for several government toxicology-related jobs but the only scientific opportunities that arose immediately were 1) maintaining tilapia tanks at Hawaii's Sea Life Park, 2) counting and categorizing pineapple parasites, and 3) studying voltage-gated sodium channels in a University of Hawaii lab. I took the latter job (best pay). A year later (things run on 'island time' there), I started getting calls from government agencies about the tox jobs, but by then I was happy doing sodium channel biophysics. A couple years later I moved with my advisor to Utah State where I finished my Ph.D. and then to University of Utah where I learned genetics and *Drosophila* biology as a postdoc. I am currently an Assistant Professor of Biological Sciences at the University of Illinois at Chicago, although the department voted unanimously to promote me to Associate Professor with tenure a year early -- so my title may change soon. My lab uses *Drosophila* to work out the molecular mechanisms controlling synapse formation. Mostly we focus on expression and clustering of postsynaptic glutamate receptors. Postsynaptic glutamate receptors are critical for neurotransmission, and changes in postsynaptic glutamate receptor number underlie learning, memory, and many neurological disorders. (You can read more on the lab's web page:

www.uic.edu/~def) I miss ISU and the toxicology program; I cannot overstate how much I learned there and how unpredictably useful much of that knowledge has become -- even in the somewhat unrelated field I work in now. Everything is toxicology! I also miss my two wonderful ISU mentors: Charlie Drewes and Joel Coats. I regret not having a chance to see Charlie again before his unexpected death last year, but hope to run into Joel again some time soon (Hi Joel!). I should also credit ISU Toxicology with giving me true name recognition. When I left ISU, I stole my name plate from the grad student office in the Insectary and now use it on my office door here at UIC!"

Teresa J. Newton (Ph.D./Atchison) "I am a research scientist with the U.S. Geological Survey's Upper Midwest Environmental Sciences Center in La Crosse, Wisconsin. My current research is focused around the conservation and management of native freshwater mussels in large rivers, including

evaluating the effects of sediment-associated contaminants. I am married to BJ (an ISU alumunus) and have two daughters: Rachel (5) and Leah (3)."



Scott Dyer (MS '86, with Joel Coats and Gary Atchison) is presently a Principal Scientist working for The Procter & Gamble Company, Cincinnati, Ohio. He wears many hats, serving several external environmental efforts for trade groups (Soap & Detergent Association (SDA), European Risk Assessment and Management ERASM), Water Environment Research Foundation (WERF)), NGO's (The Heinz Center's State of the Nation's Ecosystems Report; Health and Environmental Sciences Institute (HESI)), as well as conducting collaborative research programs with universities and government agencies. His current research is centered on three key themes: use of *in vitro* metabolism screens to provide better predictions for bioaccumulation in fish; use of interspecies correlation estimates to predict environmentally protective concentrations; and eco-epidemiology of down-the-drain chemical mixtures. Scott, his wife Teri and kids (Ian, Abby, Patrick and Grace) live in Hamilton, Ohio and venture to Iowa at least once a year, as Scott's folks live near Gilbert IA.

Richard L Fredrickson Jr DVM, MS (Osweiler) "I am currently a Diagnostician in the Veterinary Diagnostic Laboratory at the University of Illinois and maintain a small private practice focusing on beef cattle and equine. My primary focus is on diagnostic case work with an emphasis on production animal and equine diagnostics submitted to us from referring veterinarians and clients. I am the Section Head and Supervisor of the Pathology section, Histopathology section and Diagnostic Receiving department. I am married to Evon Reinsch from Gilbert Iowa, and we have one son Taw, and two daughters Kelcie and Karris."

Robert Bringolf (Ph.D./Summerfelt) “I am a Research Associate in the Department of Environmental and Molecular Toxicology at North Carolina State University. Current projects include investigation of the environmental occurrence of antidepressant pharmaceutical compounds and their effects on native freshwater mussel reproduction. We are also evaluating the occurrence and fate of steroid hormones and pharmaceuticals associated with concentrated animal feeding operations (CAFOs) in North Carolina and their effects on aquatic organisms. Additional work includes use of stable isotopes and non-lethal sampling techniques in bivalves to delineate sources of nitrogen and evaluate effectiveness of best management practices in nutrient-impacted surface waters.

Brian Hopper (M.S./Birt) is currently a first year medical student at Iowa. He is not currently doing any research but he hopes to get involved next semester in research in the cardiology arena with imaging studies.



Kenneth Turteltaub (Ph.D./Murphy), is presently a Senior Staff Fellow in the Chemistry, Materials, and Life Sciences Directorate, Lawrence Livermore National Laboratory. “My research is concerned with understanding the molecular mechanisms involved in development of diseases such as cancer. My main interest is the toxicology of carcinogens and biothreat agents at very low dose. My group uses techniques such as mass spectrometry, liquid chromatography, electrophoresis, uv/vis and fluorescence spectroscopy, radiotracer methods and accelerator mass spectrometry. My group operates the only NIN/NCRR-sponsored Research Resource to develop and apply accelerator mass spectrometry to Biomedical research. These methods are being applied to determine the bioavailability of such agents; how they interact with macromolecules; what types of metabolism are involved; how the exposure dose affects these endpoints and how different species process the compounds. My goal is to understand how to use laboratory data developed in

model systems to more accurately estimate human disease risk and to develop diagnostics for judging individual risk. We are primarily interested in specific dietary factors such as the heterocyclic amines that form in meat through cooking, and solvents such as benzene.”

Sally Pyle (MS/Hopper) “I’m currently an Associate Professor of Biology and the Director of the Honors Program at the University of North Dakota. I am collaborating with Dr. Van Doze in Pharmacology, Physiology and Therapeutics to study the role of adrenergic receptors and norepinephrine on seizure activity in a rat hippocampal slice model. We also have an NSF funded Summer Research Education for Undergraduates site where students can explore different topics in neuroscience. My daughter, Chelsea, received her BSc degree in Astrophysics from Wellesley College and is preparing for graduate school in the fall. sally.pyle@und.nodak.edu

Toxicology Graduates Fall 2005, Spring 2006, Summer 2006 and Fall 2006

Xianai Wu (M.S./Hendrich); Yi Liu (M.S./Murphy); Chuan Shen (Ph.D./Powell-Coffman) (Research Excellence Award); Yu Jiang (MS/Birt); Qi Xu (MS/Reddy, Kanthasamy); Zhong Ye (M.S./Hendrich).

A Video Look at Student Experience.

Mostly intended for prospective undergraduates but with scenes you likely will remember. Explore the student experience at Iowa State in a new online video, narrated by President Gregory Geoffroy: <http://www.iastate.edu/~president/video/video.shtml>

Streaming, Virtual and Snapshot of Iowa State University: <http://www.iastate.edu/webcam/>

Everything Ames website: <http://www.genetics.iastate.edu/ames.html>

big birthday calls for a big celebration

Iowa State's 150th birthday bash will span an entire year. The fun starts with the Veishea celebration, April 21, 2007, and runs through spring 2008: <http://www.iastate.edu/~isu150/>

Sampling of recent publications by Toxicology Graduate Students

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IOWA CENTER FOR ADVANCED NEUROTOXICOLOGY (ICAN)

Neurotoxicology bridges the scientific fields of toxicology and neuroscience and plays a key role in the health of humans and animals. Neurotoxicology has a tremendous impact on human



and animal health industries, the economy and the environment. The ICAN center has three major goals: conduct fundamental research on both animal and human related neurotoxicological

problems that are significant to Iowa and the U.S., train graduate students and postdoctoral researchers in the field of neurotoxicology, and develop technologies and treatment strategies (economic development/translational approach) for diagnosis and treatment of diseases associated with the nervous system). Research areas include environmental neurotoxicant exposures and their links to neurodegenerative disorders, prion diseases, characterize neurotoxins of parasitic worms for application as parasiticides, pathogenesis and mechanisms of neurodegenerative diseases such as Parkinson's and Alzheimer's disease, stroke, retinal degeneration, and storage diseases, applications and toxicology of nanoparticles in nervous system, and development of neuroprotective strategies and neuroscience technologies. Director: Anumantha Kanthasamy, Ph.D.

Dr. Kanthasamy established the Iowa Center for Advanced Neurotoxicology (ICAN) in the College of Veterinary Medicine. The purposes of ICAN are: (1) to conduct fundamental research on both animal and human related neurotoxicological/neurodegenerative problems, (2) to foster the training of graduate students and postdoctoral researchers in the field of neurotoxicology, and (3) to develop technologies and treatment strategies (translational/economic development strategies) for diagnosis and treatment of diseases associated with the nervous system. Many ISU faculty and National Animal Disease Center (NADC) are members of the neurotoxicology center. Further details about the center can be viewed at

<http://www.vetmed.iastate.edu/ican/default.asp>. Dr. Kanthasamy, Eugene and Linda Lloyd Endowed Professor, recently received a major NIH grant to continue his research on manganese neurotoxicity. Dr. Kanthasamy's research on Parkinson's disease was featured on the cover of Neurotoxicology (27:807-15, Sept 2006) and in "The Order of Knoll" event at ISU. (Sept. 2006).



Present Student Research

To give you an idea of some of the present student research in toxicology

Lindsey Gereszek's (Coats Lab) research involves evaluating the insecticidal activity of the natural product conjugated linoleic acid (CLA) against the European corn borer. This includes studying the development, survival, fecundity, and fatty acid profiles of corn borers fed a CLA-enriched diet.

Qi Xu's research (Dr. Manju Reddy and Dr. Kanthasamy Anumantha's lab) is to discover the neuroprotective effect of phytic acid, a natural iron chelator, in cell culture model and animal model of Parkinson's disease.



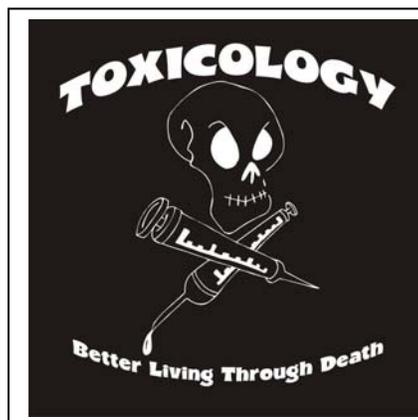
VEISHA 2006

**Toxicology Graduate Student Organization
(TGSO) Activities
Summer Term and Fall Semester 2006**

New officers were elected in May 2006:

President – Kelsey Prihoda, Entomology (Coats)
Vice President – James Delgado, Agronomy (Wolt)
Treasurer – Lindsey Gereszek, Entomology (Coats)
and Biochemistry (Bietz)

The Toxicology Graduate Student Organization (TGSO) was very busy this summer and fall semester. The Second Annual TGSO Poster Session was held in June, and was a great success again this year. We had several ISU “Research Experience for Undergraduates” (REU) Programs attend, and the Toxicology Program sponsored a Graduate Student Poster Competition with travel awards for the top three posters. We had great success with our recent t-shirt fundraiser, selling “toxicology-themed” t-shirts designed by the graduate students, which raised money for seminar



speakers. We designed a new Toxicology Program poster, which was displayed at a career fair at Wartburg College and the Society of Toxicology and Environmental Chemistry

(SETAC) North America meeting. Dr. Curtis Klaassen was invited to speak at this year’s Daniel Zaffarano Memorial Lecture, which will be part of a retreat held in April. Most importantly, we haven’t forgotten to have fun! This June TGSO held a barbeque at Emma McCarthy Lee Park and we recently had a wagon ride and bonfire at Center Grove Orchard. In the spring we plan to continue recruiting at local/national meetings and Iowa’s colleges and universities, organize Dr. Klaassen’s visit to Iowa State University and the Zaffarano Memorial Lecture, and provide hands-on toxicology activities to high school students in the Science Bound Program.



Photo by Bob Ebert, Ames Main Street running west to East. Railroad tracks in foreground. Mary Greeley Hospital in center top.



VEISHA 2006

INTERDEPARTMENTAL TOXICOLOGY.

<http://www.toxicology.iastate.edu>

Supervisory Committee: Anumantha Kanthasamy, Chair; Patricia Murphy, Joel Coats, Gary Osweiler, George Kraus, Arthi Kanthasamy. Program Coordinator: Linda Wild

Funding for the printing of this holiday newsletter was provided by the **College of Veterinary Medicine**, the **Graduate College** and the **College of Agriculture** at **Iowa State University** which provide financial support for operating expenses for the Interdepartmental Toxicology program.