



NFSTC Networker



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NATIONAL FOOD SAFETY & TOXICOLOGY CENTER

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NFSTC Researchers Recognized by Society of Toxicology for Outstanding Contributions

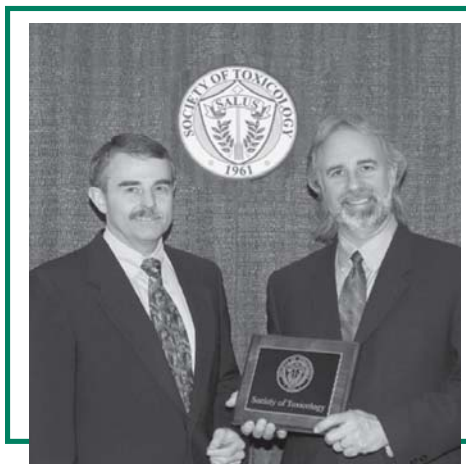
Michigan State University researchers in the Center for Integrative Toxicology received some of the top honors at the **45th Annual Meeting of the Society of Toxicology**, held March 5-9, 2006, in San Diego, California.

In recognition for unique research to predict individual hypersensitivity to pharmaceutical drugs, **Robert Roth**, professor of pharmacology and toxicology, was the SOT 2006 recipient of the **AstraZeneca Traveling Lectureship Award**. The award allows him to undertake a European lecture tour designed to expand his collaborations with European scientists. Roth was cited for his research on inflammation as a susceptibility factor for chemical-induced liver injury and the relationship of inflammatory stress to idiosyncratic drug reactions.

Roth's studies have led to a novel hypothesis about the basis for adverse reactions to drugs that uniquely affect a small percentage of users. Namely, his research suggests that a modest inflammatory response occurring during drug therapy can trigger idiosyncratic hepatotoxicity that can damage the liver. His laboratory, and others, have found that an inflammatory response, which is harmless by itself, can markedly enhance the toxicity of chemical agents. Such a modest inflammatory response can occur in people and animals through exposure to tiny amounts of bacterial products that occur normally in the intestine and are associated with several disease

conditions. Roth's research has raised the hope of developing a model to predict the idiosyncratic potential of drug candidates.

Roth's proposed lecture itinerary includes visits at the University of Liverpool, the Syngenta Central Toxicology Laboratory, and the AstraZeneca facility at Alderly Park, all in the United Kingdom; as well as the Medical University Graz in Austria, the Sanofi-Aventis Cardiovascular Division in Frankfurt, Germany, and the Institute for Toxicology at the University of Wurzburg, in Wurzburg, Germany.



Robert Roth receives the AstraZeneca Traveling Lectureship Award from NFSTC colleague Norbert Kaminski

Xiaomin Deng, an MSU-CIT postdoctoral trainee with Roth, received the **Merck Travel Award** from the SOT Toxicologic and Experimental Pathology

Specialty Section for his work on an animal model of idiosyncratic liver injury from diclofenac, a nonsteroidal anti-inflammatory drug.

Several other MSU-CIT Environmental and Integrative Toxicological Science (EITS) trainees also received special recognition at the SOT meeting for other toxicological research. **Zahidul Islam**, a research assistant professor in the lab of **James Pestka**, professor of food science and human nutrition, received the **Best Abstract Award for 2006** from the Occupational and Public Health Specialty Section for his abstract "Satratoxin G from the Black Mold *Stachybotrys chartarum* Evokes Olfactory (continued next page)



(continued from previous page) Sensory Neron Loss and Inflammation in the Murine Nose and Brain”.

Jennifer Phillips, a second year biochemistry and molecular biology graduate student enrolled in the EITS program and working with **Jay Goodman**, professor of pharmacology and toxicology, received a second place award from the Carcinogenesis Specialty Section for her work on CAR-mediated changes in DNA methylation during tumor promotion.

Beckey (Heekyong) Bae, Eleni Beli, and Yuhui (Sherry) Shi, all food science doctoral students enrolled in the EITS program working with **James Pestka**, were selected to receive travel awards to present their research at the meeting. Bae and Beli each received \$500 Burdock travel awards from the Food Safety Specialty Section. Bae, a third year student, was chosen for her work on the molecular mechanisms by which trichothecene mycotoxins initiate a ribotoxic stress response in the macrophage. Beli, a second year student, was cited for her work on the molecular mechanism by which (n-3) polyunsaturated fatty acids modulate immune system response to inflammagenic and infectious agents. Shi, a second year student, was selected for her work on (n-3) polyunsaturated fatty acids and inflammation induced by the mycotoxin deoxynivalenol (DON) that is commonly found in wheat, corn and barley.

Theresa Eagle, an undergraduate biochemistry major working with **Drs. Robert Roth and Patricia Ganey** (associate professor of pharmacology and toxicology), received a Pfizer Undergraduate Travel award. She will present her work on the role of the hemostatic system in acetaminophen hepatotoxicity, attend a dinner sponsored by Pfizer and receive a tour of their LaJolla facility.

ROAR Award to Study *E. coli* Strains

NFSTC faculty researcher, **Paul Bartlett, MPH, DVM, PhD**, has recieved funding from the Reservoirs of Antibiotic Resistance Network (ROAR) project, through the Alliance for the Prudent Use of Antibiotics for the research proposal in **Organic Agricultural Effects on the Phylogenetic Composition of *Escherichia coli* Populations from Dairy Cattle**.

Dr. Bartlett's project will compare the distribution of *Escherichia coli* phylogroups in a collection of strains isolated from cattle and organic dairy farms. Because organic farms use very limited amounts of antibiotic compared to traditional dairy farms, the effects of selection for resistance to

antibiotics can be assessed in a natural habitat. Using population genetic methods, they will determine whether resistance increases due to clonal spread of a few resistant genotypes, or due to the horizontal transfer of resistance genes. Strains will be typed for ECOR phylogroup and antibiotic susceptibility patterns. A subset of the strains that belong to the B1 phylogroup will be subjected to MLST typing.

NFSTC Welcomes Scott Winterstein as Acting Director



Effective Monday, April 10, 2006, the Michigan State University, College of Veterinary Medicine appointed **Scott Winterstein, PhD**, as the Acting Director of the NFSTC. Dr. Winterstein earned his Bachelor of Science degree in zoology from Northern Arizona University, and received his Masters of Science and Ph.D. in Biology from New Mexico State University. He also holds an M.St. in statistics from North Carolina State University. Between completing graduate school and his arrival at MSU in October 1986, he spent a year in the Experimental Statistics Department at Louisiana State University.

“The NFSTC has an outstanding reputation and it is certainly my privilege to have this opportunity to work with this outstanding team,” expressed Dr. Winterstein.

Dr. Winterstein is a full professor in the Department of Fisheries and Wildlife in the College of Agriculture and Natural Resources, with an appointment in the Michigan Agricultural Experiment Station. For the majority of his career at MSU, he was on a 50% teaching, 50% research appointment. Two years ago, he took on significant administrative duties, decreasing his teaching appointment to 25%. The majority of his research has been very applied and has focused on the ecology of terrestrial vertebrates, having worked on research focusing upon ruffed grouse, bears, deer, elk, moose, bobcats, raptors, and humans - among other things. Much of his research focus on deer has been centered on the ecology of bovine tuberculosis in the deer herd in the northeastern Lower Peninsula, and the development of techniques to estimate population parameters of wild vertebrate populations. For the past several years, Dr. Winterstein has been involved in work related to the ecology of infectious diseases of wild and domestic animals.



NFSTC Researcher Examines Impact of Metal Exposure on Cellular Activity

“The link between metal exposure and dietary consumption is fairly strong considering that many metals are normally found within the environment,” explains **John LaPres, PhD**, Assistant Professor of Biochemistry and faculty researcher with the NFSTC. LaPres studies metal-induced toxicity, determining how certain trace metals influence biological systems. He has a specific interest in nickel, manganese, and cobalt as these metals have a direct impact on the hypoxia signaling system within the body. Hypoxia, by definition, is a decrease in available oxygen reaching the tissues of the body. Humans have developed mechanisms for sensing decreases in oxygen and coping with that change (known as the hypoxia signaling system) to deal with the decrease in energy production that is concomitant with hypoxia. LaPres’ lab has shown that the hypoxia signaling system is partially responsible for cobalt-induced cytotoxicity.



Each of us possesses certain metals in our system, depending upon our individual biological makeup and historical exposure. In fact, many of these metals are essential dietary components, yet under certain situations, metals exposure can negatively influence the body. Cancer, for example, is an endpoint that is examined with metals such as nickel – a known carcinogenic metal – and with cobalt and manganese being suspected carcinogens.

One area where an increase in metal exposure may be found is in agriculture. It has been demonstrated that the level of most metals necessary to cause acute toxicity is also lethal to the plant. Long term, low-dose exposure through metal contaminated foodstuffs, however, has not been adequately researched. Plants, for example, could pick up trace amounts of metals; and over long-term, effect the cellular activity of key regulatory pathways, leading to toxicity and/or increasing the risk of disease, such as cancer.

LaPres’ lab is also examining the effects of cadmium exposure. Cadmium is mined and produced primarily for nickel-cadmium battery and metal alloy production. People who are of greatest risk for metal exposure from cadmium are those who work in the metal industry since they breathe a lot of residue during metal shaving and heating processes. In addition, the public is becoming increasingly exposed to these metals

through their everyday activities. The technological appliances (computers, cell phones, etc.) that we use on a daily basis expose us to the nickel-cadmium batteries and other metals used in these products. In addition, consumer attitudes toward these appliances have changed as many individuals see these as disposable products. This means that as consumers upgrade and replace products, more of the cadmium batteries and metal containing circuitries from these products are discarded into landfills. These technological disposables will continue to increase exposure levels to metals as they leach into water and food systems; thus becoming a public health concern. Through continued research and understanding of how metals influence the biological process, researchers like Dr. LaPres may aid policymakers in decisions that impact agricultural, industrial, and public health policies and outcomes.

MRU Project Welcomes New Team Member

As a part of the Microbial Research Unit (MRU) project, **Dr. Seongbeom Cho** has joined the team as a post-doctoral fellow to work on the *Salmonella Enteritidis* projects headed by Drs. Mahdi Saeed and Thomas Whittam. The group has established a collaborative research with Dr. Lu from the University of California, Berkeley and the Minnesota Department of Health to study the virulence of *Salmonella Enteritidis* mutants and their ability to cause infection in chicken that is associated with egg contamination with the organisms. Dr. Cho is producing exciting results on the use of a new molecular techniques for a better classification of the *Salmonella* organisms.



MSU Undergrad Named MSU & Michigan Student Employee of the Year



The NFSTC congratulates **David Hamman**, recipient of the **2006 MSU Student Employee of the Year** as well as the **2006 Michigan Student Employee of the Year**. David was recognized with both accolades during National Student Employment Week (April 9 - 15, 2006), having been nominated by his supervisor, Jeremy Moore, from the NFSTC Aquatic Toxicology

Laboratory for “his diligence, excellence, (continued on last page)



Avian Influenza Expert Joins NFSTC Faculty



Kevin Walker, MS, PhD, recently joined the faculty of the National Food Safety & Toxicology Center in a collaborative partnership with Michigan State University, the U.S. Department of Agriculture, Animal Plant Health Inspection Service (USDA/APHIS), and the University of Minnesota.

The previous eight years, he was

Director of Agricultural Health and Food Safety within the Inter-American Institute for Cooperation in Agriculture, based in Costa Rica, where he worked with national governments in the thirty-four countries in the Americas to enhance public infrastructure, leadership development, emerging issues assessments, and implementation of international trade standards and agreements.

Before working overseas, he was the Director of the Centers for Emerging Issues within APHIS/Veterinary Services. During this time, the Center carried out a variety of national risk analyses for emerging issues including bovine spongiform encephalopathy (BSE), *E. coli* 0157:H7, avian influenza, and tuberculosis.

Dr. Walker has collaborated and worked with a large number of organizations including the World Trade Organization, the World Organization for Animal Health, the United Nations Food and Agricultural Organization, the International Plant Protection Convention, the Codex Alimentarius, and the National Academy of Sciences. He is also a fellow with the Kellogg Foundation.

The collaborative initiative between the two universities and USDA centers on four strategic lines of activity: 1) Strengthening leadership in order to address emerging animal/public health issues through Leadership for Emerging Animal/Public Health Decision-makers (LEAHD); 2) International outreach towards more effective overseas approaches and alliances; 3) Enhancing national veterinary services in collaboration with the World Organization for Animal Health (OIE); and 4) Raising domestic awareness and educational outreach of our inter-connected agricultural health world.

An overarching objective is to engage a broader constituency, forge new and creative partnerships, leverage additional expertise, and enhance future strategic capacity. Recent events, such as Avian Influenza H5N1, is the latest in a

line of emerging diseases on a global scale and a result of the convergence of biological, socioeconomic, and environmental factors that overwhelm inadequate and sometimes almost nonexistent health infrastructures in individual countries and then spillover internationally.

As a strategic initiative, its overall success will depend on a sustained commitment of resources and priority over a sufficient time frame to enable alliances to be formed, developed, and executed around issues of common interest. This two-year action plan is viewed as the first installment of a strategic initiative to be carried out over a number of years.

The challenge ahead is to continually improve sanitary and phytosanitary health which is no longer the unique domain of production agriculture. In an increasingly interconnected society and world, policies and practices at the production level can also impact other sectors including trade, public health, food security, biosecurity, tourism, and the environment. The future poses at least two fundamental challenges: 1) to anticipate and address emerging issues and risks even further offshore than in the past, and before these issues convert into domestic emergencies or political crises; and 2) to advance strategic alliances and partnerships that invites the participation of other sectors and helps establish the technical and political base for continued support and action.

Counterfeit Food & Beverage Packaging Impacts Food Safety

Counterfeit threats for products, including food and beverage, are becoming more common as supply chains become more global and as imaging and manufacturing technology become more accessible.

Consumers are aware of counterfeiting of luxury goods and of intellectual property such as CDs and DVDs, but counterfeiting of standard product and food goods are increasing. The threat was further explored during the Online Food Safety Pro-MS graduate class, "Packaging for Food Safety & Security". For the food and beverage industry, this is especially alarming since Eastern Europe/Central Asia is experiencing a 70%+ rate of counterfeit products across many product lines. Criminal organizations often produce products in countries with only incremental improvements in the quality of product, and package products could infiltrate the comparable supply chains in the U.S. marketplace.





Product counterfeiting has been increasing in awareness and threat, and information and product technology is hitting a “tipping-point” for both the quality of counterfeits and our ability to disrupt the criminal activities. Several Michigan State University teams, including the NFSTC, have formed the “**Anti-Counterfeit Research (ACR) Group,**” a partnership between academia, agencies, and industry to academically quantify the risks, strategic nature of the threat organizations, and as a group, to advance systems and research to thwart the threats. For additional information on the ACR, contact **John Spink**, Co-Director of the ACR, faculty instructor at the NFSTC at MSU, and researcher in the MSU School of Packaging, at (517) 381-4491 or Spinkj@msu.edu.

NFSTC Welcomes New Director of Online ProMS Program



Julie Funk, DVM, MS, PhD, has joined the National Food Safety & Toxicology Center as the new Director of the Online Professional Master of Science (ProMS) in Food Safety Program, effective April 1, 2006. Dr. Funk assumed this role as Dr. Edward Mather reduced his time within the NFSTC. Dr. Funk is an associate professor of pre-harvest food safety in the Department of Large Animal Clinical Sciences in the College of

Veterinary Medicine. She received her DVM from Michigan State University and spent two years as an associate in a predominantly swine practice in Wolcott, Indiana. Following practice, she completed a Residency/Masters Program at the University of Illinois in Population Medicine and a Ph.D. from North Carolina State University in Comparative Biomedical Sciences that had an epidemiology focus. Prior to joining the NFSTC, she was an assistant professor of food safety epidemiology in the Department of Veterinary Preventive Medicine, College of Veterinary Medicine, The Ohio State University. Dr. Funk’s research interests include the pre-harvest epidemiology of foodborne pathogens in food animals, as well as antimicrobial use and antimicrobial resistance in food animal populations.

National Center for Food Protection and Defense Scholars and Fellows Gather

Efforts to safeguard our nation from the threat of terrorism were highlighted Monday, April 17, as the National Center for Food Protection and Defense (NCFPD) and the NFSTC recognized 21MSU students funded by the U.S. Department of Homeland Security (DHS) for homeland security research and education projects. Dr. Ed Mather, of the NFSTC, made clear the event’s purpose – to provide fellow students and their faculty advisors an opportunity to meet and discuss their research relevant to homeland security.

The NCFPD, a university-based Homeland Security Center established in 2004 by the U.S. Department of Homeland Security, is lead by the University of Minnesota. Collaborators include Michigan State University (leading the educational initiatives), North Dakota State University, Georgia Institute of Technology, University of Tennessee–Knoxville, and University of Wisconsin–Madison, along with individual investigators from 14 other universities.

Representing the DHS was Laura Petonito, Director, Office of University Programs. Petonito addressed the significance of collaborative student and faculty research in meeting today’s homeland security challenges. She described efforts made at MSU as a model for government agencies and other DHS-funded academic centers. Representing MSU were students from disciplines as varied as forensic science, anthropology, microbiology, chemistry, communication, and supply chain management.

This annual event will showcase students’ research and serve as an opportunity for increased interaction among University faculty.

Graduate Level Food Safety Courses Offered Through Lifelong Education

Lifelong Education applications are now being accepted for Fall Semester 2006 with classes beginning on August 28. These courses are for the working professional desiring the most up-to-date food safety knowledge. These courses are offered through the Online Professional Masters of Science (ProMS) in Food Safety program; however, participants do not have to be enrolled in the graduate program to enroll in these courses.

Course offerings include: **Food Protection and Defense (VM/CJ 821)**, a team-taught course by experts in the fields of Homeland Security, Emergency Management, Public-Private Partnerships, Transportation, Production, Processing, Retail and Supply-Chain Security, Food Vulnerability Assessment, Third-Party Certification and Economic Recovery; **Packaging for Food Safety (VM/PKG 814)** is a course organized as Executive Education providing the student with skills and insights to apply to immediate and current packaging (continued on last page)



O u t r e a c h

Student Employee of Year, continued

(continued from page 3) and accomplishment.” In his nomination of David for these awards, Moore indicated that David “has served the Aquatic Toxicology Laboratory and represented the National Food Safety & Toxicology Center beyond description through diligence and excellence and David Hamman has and will continue to represent Michigan State University to the fullest as he continues to exceed expectations on his path toward greater and greater things.”

Working within the Aquatic Toxicology Laboratory of the NFSTC for two years, David is assigned to the the Tittabawassee River Project. In response to being named both Michigan State University Student Employee of the Year and the State of Michigan Student Employee of the Year, David states, “My time at the Aquatic Toxicology Laboratory had been extremely rewarding. I can’t think of another lab on campus that would have given me the diversity of experiences that I have had with this lab. The only thing better than the work itself has been the quality of the team, both field and lab, that I have had the pleasure of working with.”

Lifelong Education, continued

(continued from page 5) and food safety issues; and **Food Irradiation** (VM 816) is a course exploring the principles and practices of the irradiation of food for pathogen reduction, food preservation, and the elimination of pests and insects, providing participants with a 360-degree perspective on the science, history, marketing, education, and business of irradiation of food for consumption.

These adult online courses are developed for the food safety professional and scientist who wishes to continue his/her education while at the same time continuing his/her career. Each three-credit course may be applicable toward a graduate degree program.

For additional information about the Lifelong Education courses, please visit www.foodsafe.msu.edu or contact **Kristie D. Gates**, National Food Safety & Toxicology Center, gatesk@msu.edu or (517) 432-3100 x121.

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National Food Safety & Toxicology Center
Michigan State University
165 Food Safety & Toxicology Building
East Lansing, MI 48824-1302
ADDRESS SERVICE REQUESTED



For more information about the
National Food Safety & Toxicology Center contact
Sandra Enness, Director of Communications
phone: 517-432-3100 fax: 517-432-2310
email: eness@msu.edu