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CIT Update

Michigan State University Spring 2006

In this issue

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MSU-CIT researchers honored by SOT

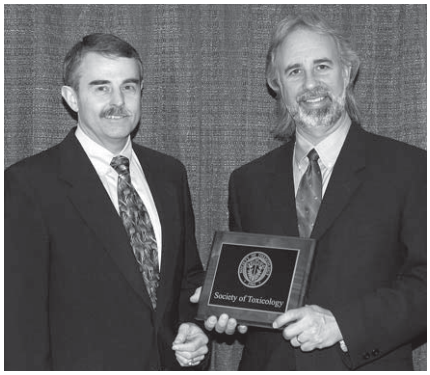
Michigan State University researchers in the Center for Integrative Toxicology received a number of prestigious honors at the 45th Annual Meeting of the Society of Toxicology being held March 5-9, 2006 in San Diego, California.

In recognition of unique research to predict individual hypersensitivity to pharmaceutical drugs, Robert Roth, a professor of pharmacology and toxicology, is 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 concerning 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 Frankfort, Germany, and the Institute for Toxicology at the University of Wurzburt, in Wurzburg, Germany.



Bob Roth, accepting the AstraZeneca Travel Award, from CIT Director Norb Kaminski.

Xiaomin Deng, a MSU-CIT postdoctoral trainee with Roth, also received the Merck Travel Award from the SOT Toxicologic and Experimental Pathology Specialty Section for his work on an animal model of idosyncratic liver injury from diclofenac, a nonsteroidal anti-inflammatory drug. The award provided funds for Deng to present his work at the SOT annual meeting.

Several other MSU-CIT Environmental and Integrative Toxicological Science (EITS) trainees also received special recognition from the SOT 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 Sensory Neron Loss

See SOT, page 2

SOT, from page 1

and Inflammation in the Murine Nose and Brain". Islam received a plaque, a $500 check, and an award from Taylor-Francis Publications.

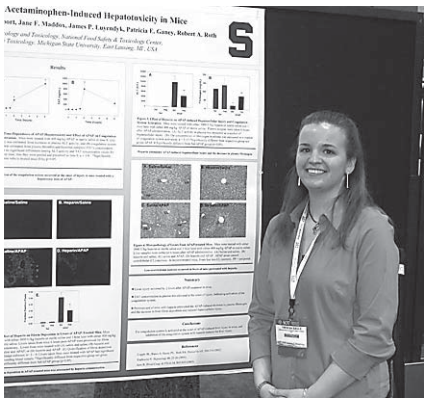
Darrell Boverhof, former graduate student and now a postdoctoral trainee in professor Tim Zacharewski's lab, received a first place research award from the Molecular Biology Specialty Section for his poster "Dioxin Induces an Estrogen-like, Estrogen Receptor Dependent Gene Expression Response in the Murine Uterus."

Jennifer Phillips, a second year biochemistry and molecular biol-

MSU toxicologists were highly visible throughout the SOT annual meeting with over 50 abstracts presented.

ogy 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 also received a $500 travel award from the Regulatory and Safety Evaluation Specialty Section (RSESS). Shi received a $500 SOT graduate travel award. Bae, a third year student, was chosen for her work on the molecular mechanisms by which trichothecene mycotoxins



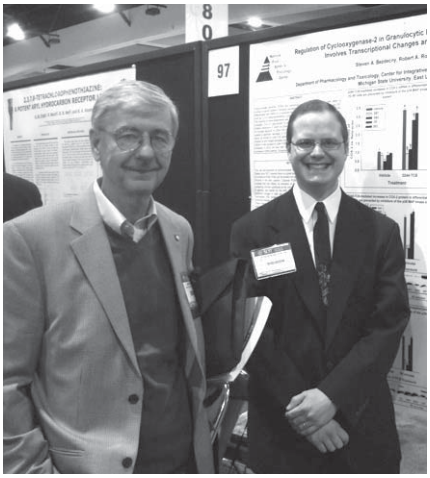
Theresa Eagle received a Pfizer Undergraduate Travel award.

The CIT has the unique distinction of having four current or former affiliated faculty members plus two students who have been President of the Society of Toxicology. Five of these individuals, are pictured here at the MSU reception sponsored by the CIT during the SOT 2006 Annual Meeting held in March. They are, along with the dates of their Presidency and CIT-affiliation, from left to right: Jay Goodman, 1999-2000, CIT-affilated faculty member; Ken Wallace, current President, 2005-2006, former doctoral trainee with Jerry Hook; Jerry Hook, 1987-1988, founding director of the MSU Center for Environmental Toxicology (now the CIT); Jim Gibson, 1988-1989, former faculty member; and Jim Bus, 1996-1997, completed Ph.D. with Jim Gibson. Regretfully, Perry Gehring, 1980-1981, former faculty member, is deceased.

initiate a ribotoxic stress response in the macrophange. 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.

Also, Theresa Eagle, an undergraduate biochemistry major working with Roth and Patricia Ganey, associate professor of pharmacology and toxicology, received a Pfizer Undergraduate Travel award to defray the cost of travel expenses and registration for the meeting. She presented her work on the role of the hemostatic system in acetaminophen hepatotoxicity, attended a dinner sponsored by Pfizer and received a tour of their LaJolla facility.

Additionally, numerous individuals affiliated with the CIT have been elected and appointed to important positions within SOT. Currently, Norb Kaminski, CIT Director, is the SOT Treasurer, Patti Ganey, CIT-affiliated faculty, is a



Former CIT Director Larry Fischer with doctoral candidate Steve Bezdeckny.

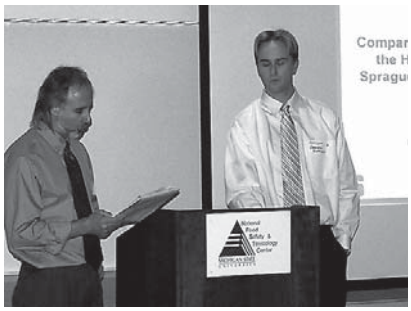
member of the Awards Committee, Jacqueline Smith (Ph.D., PHM/TOX, 1983) is a member of the Finance Committee, Jim Luyendyk, a recently graduated doctoral trainee, is a representative to the Post-Doctoral Assembly, and Patrick Shaw, doctoral trainee, is the Michigan Chapter representative to the Student Advisory Committee.

CIT hosts annual research eve

The Center for Integrative Toxicology hosted a research evening for faculty and students in the Center's training program in Environmental and Integrative Toxicological Sciences (EITS) in December. Over 40 faculty, current trainees, and prospective trainees attended.

CIT Director, Norb Kaminski announced the availability of student training Fellowships administered by the Center with funding from the National Institutes of Environmental Health Sciences as well as from the MSU Graduate School.

Bob Roth, the Center's Graduate Program Director, gave an overview of the EITS program and alerted students to upcoming opportunities in available courses.



Darell Boverof, one of the evening's presentors, was introduced by CIT Director Norb Kaminski.

Three trainees presented their research. Rita Seston, a doctoral trainee with John Giesy, Zoology, presented "Assessment of PCDFs and PCDDs in the Tittabawassee River basin." Seston also presented her work at the 2005 Annual Meeting of the Society of Environmental Toxicology and Chemistry meeting (see page 8).

Gautham Rao, a predoctoral trainee with Director Kaminski, presented "Elevation of Calcium by Delta-9-THC in T cells". Rao completed his doctorate in 2005 and is currently pursuing postdoctoral training in immunology at Yale University.

Darell Boverhof, a recent doctoral graduate, working with Timothy Zacharewski, Biochemistry and Molecular Biology, presented "Comparative Toxicogenomic Analysis of the Hepatotoxic Effects of TCDD in Sprague Dawley Rats and C57BL/6 Mice".

The evening also provided an opportunity for students and faculty to mix and enjoy refreshments.

Research initiative on chronic respiratory diseases

Some CIT-affiliated faculty along with other MSU colleagues are teaming up to unite their research on chronic respiratory disease, hoping to identify new treatments and understand why these diseases are becoming more prevalent. One goal of their collaborations is to compete for NIH program project and center grants.

Led by Jack Harkema, Norbert Kaminski, Susan Ewart and N. Edward Robinson, all CIT-affiliates, the group recently received one of ten grants from MSU's Fund for the Enhancement of Academic Quality to further collaborations and generate preliminary data.

The team's objective is to identify markers of disease susceptibility so that health care interventions will impact airway disease.

In humans, chronic respiratory diseases include asthma, cystic fibrosis, emphysema, bronchitis, idiopathic pulmonary fibrosis, and chronic obstructive pulmonary disease.

The investigators involved number 18 and include faculty from Biochemistry and Molecular Biology, Epidemiology, Food Science, Large Animal Clinical Sciences, Mechanical Engineering, Medicine, Nursing, Pathobiology and Diagnostic Investigation, Pharmacology and Toxicology, and Physiology.

Some of the research encompassed in the new initiative includes the following investigations:

- In **Jack Harkema's** research mice and rat models are ellucidating the cellular and molecular mechanisms that underlie respiratory diseases. Harkema studies the effects of air pollutants and recently, shed new light on the nasal toxicity of nanoparticles and black mold (see pg. 6).

- Working with **James Wagner**, a fellow researcher in the Department of Pathobiology and Diagnostic Investigation, a symbiotic relationship between ozone and other pollutants and allergens has been uncovered.

- Another PDI colleague, **Kurt Williams**, investigates cat lung disease that is strikingly similar to idiopathic pulmonary fibrosis, a lethal lung disease for humans.

- Meanwhile, **Susan Ewart**, director of the MSU Molecular Respiratory and Equine Genetics Laboratory, is working to find the genes and environmental factors responsible for allergic asthma.

- Ewart's Large Animal Clinical Sciences colleague, **N. Eward Robinson**, is investigating the prevalence and genetic predisposition of heaves, an asthma-like equine disease.

- **Norb Kaminski** has been establishing a model of murine influenza in collaboration with Jack Harkema that will be used to assess the effects of immune suppressive toxicants on host resistance to the virus.

Grants/contracts received by CIT faculty affiliates

Over 17 million accepted by MSU Board

MSU-CIT-affiliated faculty finished 2005 with over 17 million dollars in research contracts and grants accepted by the MSU Board of Trustees at their September, October and December 2005 meetings.

Totaling $17,043,977, these awards largely came from the National Institutes of Health (NIH) and the Public Health Service (PHS), as well as other federal and state government agencies, corporations, and universities. The majority of the awards represent just one year in a multi-year funding cycle, ensuring that toxicology-related research will continue to thrive at MSU for years to come.

The continuation of the Superfund Basic Research Grant to the CIT tops the list with $2,751,719 from the National Institute of Environmental Health Sciences accepted for this fiscal year. This is one of the largest single grant amounts accepted by the MSU Board during 2005.

However, several CIT-affiliates also took the Principal Investigator role on other significant grant awards. For example:

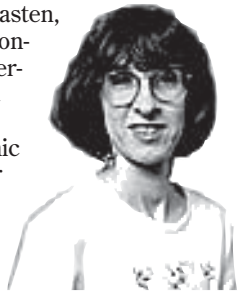
- Robert Hollingworth, Entomology, along with co-investigators Satoru Miyazaki and Wayne Jiang, both from the Agriculture Experiment Station, were awarded $1,354,300 for NC Region IR-4 Leader Lab Program to clear pest control agents for minor uses from ES-USDA.

- Kenneth Rosenman, Medicine, was awarded $680,242 for his ongoing work in providing surveillance for the State of Michigan on occupational injury and illness from the Centers for Disease Control.

- James Tiedje, Center for Microbial Ecology, leads a team that is exploring the genome and proteome of desulftrobacterium hafiniense DCB2 for IT protein complexes involved in metal reduction. The US Department of Energy awarded $754,250.

- Timothy Zacharewski, Biochemistry and Molecular Biology, with co-PI Jack Harkema, Pathobiology and Diagnostic Investigation, received $617,117 from the National Institutes of Health for research on the metabolic assessment of estrogenic endocrine disruptors.

- Susan Masten, Civil and Environmental Engineering, heads up a project on self-cleaning ceramic membranes for the removal of natural and synthetic nanomaterials from drinking water that received $1,439,999 from the National Science Foundation.



The following list of the other grants includes the principal investigator (PI), the PI's primary department, co-PIs, amount, title, and agency.

Bursian, Steven; Animal Science: $16,974 for "Petroleum Oil-Induced Adrenal Hypertrophy in Mink: Effects of Stress, Gender, and Oil Composition on Adrenal Function" from the University of California-Davis; $20,000 for "Research on Nutrition, Toxicology, Behavior and Management of Mink" from the Mink Farmers Research Foundation I.

Ewart, Susan L.; Large Animal Clinical Sciences; and Karmaus, Wilfried J: $343,236 for "Genetic and Epidemiologic Cohort Study of Asthma and Allergy" from the NIH/PHS.

Ganey, Patricia E.; Pharmacology and Toxicology; and Zacharewski, Timothy: $377,500 for "Gene Expression in Drug-Inflammation Models as Predictive of Idiosyncratic ADRS" from the NIH/PHS.

Giesy, John P.; Zoology: $14,051 for "Development of an Assay Using the H295r Cell Line to Identify Chemical Modulators of Steriodogenesis and Aromatase Activity" from Entrix, Inc.

Goodman, Jay I.; Pharmacology and Toxicology; $100,000 for "Altered DNA Metylations in Carcinogenesis" from the RJ Reynolds Tobacco Company.

Harkema, Jack R.; Pathobiology and Diagnostic Investigation; and Wagner, James G.: $14,950 for "Nasal Injury in Infant Monkeys Exposed to Ozone (Project 3 of Program Project – Postlethwait, PI)" from the University of Alabama; and Harkema, Jack R.: $62,000 for "Histopathology and Morphometric Determination of Endothelial and Epithelial Cell Proliferation in the Nasal and Pulmonary" from the American Chemical Council.

Hashsham, Syed Anwar; Civil and Environmental Engineering; and Tiedje, James M.; and Cole, James R.: $468,111 for "Flexible Biochip for Highly Parallel Microbial Detection" from the NIH.

Hollingworth, Robert; Entomology; and Miyazaki, Satoru: $10,000 for "Herbicides for Minor Use Food Crops" from the Agricultural Research Service, USDA; Hollingworth and Miyazaki, Satoru: $190,000 for "A National Agricultural Program: Clearance of Chemicals and Biologics for Minor or Special Uses/Pesticides" from Rutgers University; and Hollingworth and Miyazaki: $183,900 for "IR-4 Fungicide/Herbicide/Insecticide and Field Efficacy Studies" from Rutgers University.

Jacobs, Lee; Crop and Soil Sciences: $10,000 for "Ag Expo Demo Site" from the Michigan Department of Environmental Quality.

Kaminski, Norbert; Center for Integrative Toxicology: $2,751,719 for "Health Hazards from Groundwater Contamination" from the National Institute of Environmental Health Sciences (NIEHS); $314,400 for "Impairment of B Cell Differentiation by TCDD" from the NIEHS; and $328,742 for "IL-2 Suppression by Endocannabinoid Activation of PPAR γ" from the National Institute on Drug Abuse.

Kaneene, John B.; Diagnostic Center for Population and Animal Health; Fitzgerald, Scott D.; and Bolin, Steven R.: $328,726 for "Bovine Tuberculosis: Epidemiology, Diagnosis, and Pathogenesis" from the ES-USDA; and Kaneene and Mauer, Whitney Allyson: $100,000 for "Michigan Stride System to Report Integrated Diseases Events: Phase IV" from the Michigan Department of Community Health.

Karmaus, Wilfried J.; Epidemiology; and Chou, Karen: $220,961 for "Organochlorines and Sex Steroids in Two Michigan Cohorts" from the Agency

for Toxic Substances and Disease Regulation-PHS.

LaPres, John J.; Biochemistry and Molecular Biology: $279,960 for "Hypoxia and an Epigenetic Mechanism for Toxicity" from the NIH.

Linz, John E.; Food Science and Human Nutrition; and Mansfield, Linda S.: $228,111 for "Natural Transformation of Campylobacter Jejuni in Chickens: Impact on Food Safety" from the ES-USDA.

Long, David T.; Geological Sciences; and Giesy, John P.: $140,909 for "A Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters: Sediments" from the Michigan Department of Environmental Quality.

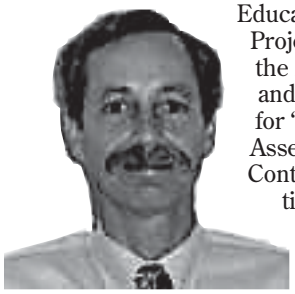
Maher, Veronica M., College of Osteopathic Medicine Research and Advanced Study Programs, and McCormick, J. Justin: $347,588 for "Error Prone Vs Error Free DNA Replication in Human Cells" from the NIH.

Paneth, Nigel; Epidemiology; and Davies, Herbert O.: $100,907 for "Training Program in Perinatal Epidemiology" from the NIH.

Pestka, James J.; Food Science and Human Nutrition: $335,805 for "Mechanisms of Trichothecene Toxicity" from the NIH/PHS; $93,710 for "Human Susceptibility to Trichothecenes" from the USDA; and $23,000 Efficacy of Healthreat Formulas in Remediation of Black Mold-Contaminated Buildings" from Spectrum Enterprises LLC.

Pinnavaia, Thomas J.; Chemistry: $38,000 for "Synthetic Silicates for the Production of High Performance Aerospace Nanocomposites" from NASA; $45,000 for "Clay Nanoparticle Reinforcement of Aeorospace Polymers" from NASA; and with Tepe, Jetze P. M.; and LaPres, John J.: $239,200 for "New Methods in Phosphoproteomics" from the NIH.

Rosenman, Kenneth; Medicine: $298,557 for "Genetic Exposure Interaction in Beryllium Disease" from the NIH/PHS; $311,500 for "Michigan Sensor Project" from Michigan Consumer and Industry Services; $28,252 for "State-Wide Asthma Mortality Review" from the Michigan Department of Community Health (MDCH); $21,440 for "ABLES" from the Centers for Disease Control-PHS; $22,744 for "ABLES" from Michigan Labor and Economic Growth; $12,837 for "Work-Related Asthma



Education Project" from the MDCH; and $5,400 for "Fatality Assessment and Control Evaluation (FACE)" from the Michigan Farm Bureau.

Roth, Robert A.; National Food Safety and Toxicology Center; and Tukov, Frances Fonyuy: $38,500 for "Development of an in Vitro Model for Studying Drug-Induced Idiosyncratic Liver Injury from the Society of Toxicology; and Roth, Robert A.; $231,726 for "Inflammation and Drug Idiosyncrasy" from the NIH.

Sikarskie, James G.; Small Animal Clinical Sciences: $330,210 for "Bald Eagle Biosentinel Monitoring of Inland Watersheds and Great Lakes Shorelines" from the Michigan Department of Environmental Quality; and $61,000 for "Herring Gull Biosentinel Monitoring of Great Lakes Breeding Areas" from the Michigan Department of Environmental Quality.

Swain, Greg M.; Chemistry: $193,695 for "Sympathetic Neural Control Mechanisms in Hypertension" from the NIH/PHS; $130,000 for "Metal/Diamond Composit Thin-Film Electrodes, New Carbon Supported Catalytic Electrodes" from the US Department of Energy; $109,011 for "Advanced Diamond Electrodes for Electrochemical-Based Monitoring of Spacecraft Water" from NASA; and $10,000 for "Expansion to ONR Award N000140310995 – Advanced Analytical Methods for Water Quality Monitoring" from the US Office of Naval Research, USDN.

Tiedje, James M.; Center for Microbial Ecology; Cole, James R.; and Garrity, George: $150,000 for "The Ribosomal Database Project: Automation, Integration and Education" from the National Science Foundation; Tiedje, Cole, and Garrity: $323,709 for "The Ribosomal

Database Project: Automation, Integration and Education" from the US Department of Energy; Tiedje, James: $231,946 for "Molecular Approaches to Understanding C and N Dynamics in Marine Sediments and Their Role in Global Carbon Cycling" from the US Department of Energy; Tiedje and Marsh, Terrence L.: $75,000 for "Towards Understanding Population Dynamics of Metal and Radionuclide Reducers at Field Remediation Sites: from the US Department of Energy; and Tiedje and Konstantinidis, Konstantinos: $117,345 for "Genomic Approaches to Advance the Species Definition of Prokaryotes" from the National Science Foundation.

Uhal, Bruce David; Physiology: $243,396 for "Control of Type II Pneumocyte Proliferation" from the NIH/PHS; and $2,673 for "Minority Supplement to Control of Type II Pneumocyte Proliferation" from the NIH.

Voice, Thomas C; Institute of International Health; and Long, David T.: $200,000 for "Training and Research in Environmental Heath – the Balkans" from Fogarty International Center-NIH/PHS; Voice; Civil and Environmental Engineering; and Riley, Kirk S.: $92,500 for "Technical Outreach/Midwest Hazardous Substance Research Center" from Purdue University; and Voice, Civil and Environmental Engineering and Tarabara, V.V.; and Vruening, Merlin L.: $460,751 for "USA-Ukraine-France-Russia Partnership New Generation Synthetic Membranes: Nanotechnology for Drinking Water Safety" from the National Science Foundation.

Wagner, James G.; Pathobiology and Diagnostic Investigation; Harkema, Jack R.: $288,800 for "Preclinical Evaluation of CAM Therapies for Asthma (Project 2)" from the University of North Carolina.

Zacharewski, Timothy; Biochemistry and Molecular Biology: $355,063 for "AH Receptor Mediated Ligand Toxicity" from the NIH/PHS; $40,000 for "General Research in the Area of Toxicogenomics" from Dow Chemical Company; and Zacharewski; Chang, Chia-Cheng; Chan, Christina; and Harkema, Jack: $377,500 for "Human Stem Cells for Toxicity Screening"

CIT faculty part of 2006 AAAS Annual Meeting

The American Association for the Advancement of Science annual meeting, Feb. 16-20, 2006 in St. Louis, is an international science and technology extravaganza, with a range and impact that generates extensive news coverage and influences science conference organizers around the world. This year, two CIT-affiliated faculty members participated.

Jack Harkema, University Distinguished Professor of pathobiology and diagnostic investigations presented "Nanoparticle-Induced Injury and Remodeling of Nasal Airway Epithelium."

Jack Harkema

The nose, usually the first line of defense against inhaled airborne particles that could damage the lungs, may itself be susceptible to the dangers of extremely small particles, called nanoparticles, which are less than 100 nanometers in size. One nanometer is one-billionth of a meter.

According to the research presented, combustion-derived nanoparticles, or CDNPs, have the ability to collect in the nasal airways, potentially causing a number of ailments, including rhinitis, inflammation of the mucous membranes.

CDNPs are byproducts of coal-fired power plants, waste incinerators and diesel-powered vehicles. They are also found in the production of carbon black, an elemental carbon that is widely used in rubber tires, gaskets, and in pigments for paints, plastics and inks.

Dan Bronstein, professor of community, agriculture, recreation, and resource studies presented "Adaptive Environmental Management: The Valles Caldera Experience."

Having a say in how the government manages nearby federal lands makes sense to both local residents and federal officials. But the devil is in the details of how this local input is gathered. Known as adaptive environmental management, the concept is popular in Europe, but has only been officially attempted in one location in the United States.

"Adaptive environmental management means there is a commitment to have on-going local community involvement in making and assessing environmental policy," Bronstein said. "It's a hot topic right now, but the question has always been whether the government can implement the monitoring that is needed to make it work."

Dan Bronstein

Notables

•**Tom Voice**, professor of civil and environmental engineering, leads a team that received nearly $2.5 million over five years from the National Science Foundation for "USA-Ukraine-France-Russia Partnership: New Generation Synthetic Membranes – Nanotechnology for Drinking Water Safety." The grant, one of 12 awarded, will develop, evaluate and apply a new generation of materials for drinking water treatment.

•**Steven Boyd**, professor of crop and soil sciences, and **Brian Teppen**, associate professor of crop and soil sciences, and colleagues, published "Enhanced Sorption of Trichloroethene by Smectite Clay Exchanged with Cs+", Environ Sci Technol. 2006 Feb 1; 40(3):894-9.

•**Jay Goodman**, professor of Pharmacology and Toxicology, and recent CIT graduate Amy Bachman, and colleagues published "Altered Methylation in Gene-specific and GC-rich regions of DNA is Progressive and Nonrandom During Promotion of Skin Tumorigenesis," Toxicol Sci. 2006 Mar 28; [Epub ahead of print].

•**James Pestka**, professor of food science and human nutrition, and colleagues, published "T-2 Toxin Impairment of Enteric Reovirus Clearance in the Mouse Associated with Suppruessed Immunoglobulin and IFN-gamma Response", Toxicol Appl Pharmacol. 2006 Feb 24; [Epub ahead of print]

•**James Trosko**, professor of pediatrics and human development, recently gave scientific lectures at Warwick University in England and had recently traveled to Seole, Korea , where he was invited to present his recent scientific advances in adult stem cell research and to confer with Korean scientists also working in this area. He then traveled to San Fransico, California to moderate a "Stem Cell Development" Conference. Trosko was also an invited lecturer at the Servier Pharmaceutical Company conference in Paris, France in November.

Toxicology taught in Thailand

In October 2005, Drs. Judy Zelikoff (New York University), Nancy Denslow (University of Florida) and Norb Kaminski (Michigan State University) offered a two-week long short course entitled, "Environmental Immunotoxicology and Reproductive Toxicology: A Deeper Look into the Science of Toxicology" at the Chulabhorn Research Institute, Bangkok, Thailand.

This is an advanced graduate level course consisting of three parts, Basic Principles of Immunotoxicology, Reproductive Toxicology, and Cellular and Molecular Approaches in Immunotoxicology for which Dr. Kaminski serves as the co-course organizer and lecturer.

In addition to graduate trainees from the Chulabhorn Research Institute, trainees from the neighboring Asian Institute of Technology and Mahidol University in Bangkok were also enrolled. This was the second time in three years the advanced short course has been offered. Due to its success, plans are currently underway to offer the short course again in the fall of 2007.

The Chulabhorn Research Institute is an autonomous, multidisciplinary institute with research and education organized within two general research sections, Chemistry and Biomedical Research. Within the Biomedical Research Section, six sub-areas are represented including biochemistry, biotechnology, chemical carcinogenesis, environmental toxicology, immunology and pharmacology.

The Chulabhorn Research Institute was founded in 1987 and is directed by Professor Dr. Her Royal Highness Princess Chulabhorn Mahidol, the current President of the research institute.

Norb Kaminski, CIT Director (far left), pictured here with graduate students at the Chulabhorn Research Institute in Bangkok, Thailand.

CIT seminars highlight changing role of toxicology

From new toxicological approaches being utilized in drug discovery to the use of toxicology in the safety assessment of genetically modified crops, the Center for Integrative Toxicology's recent and upcoming seminar speakers have provided an overview of the changing role of toxicology.

Back in September, Dr. Dale Morris, Senior Director, Worldwide Safety Sciences at Pfizer, Inc. talked about the types of toxicities and mechanistic approaches that are being used to enhance the safety profile of drug candidates. He noted that the pharmaceutical industry is focused on the earlier engagement of toxicology in the drug discovery process. Innovative approaches include the development and use of predictive in vitro and in vivo models, the identification of non-invasively monitorable safety biomarkers, and the identification of structure-toxicity-relationships.

In November, the CIT co-sponsored with the department of pharmacology and toxicology, Donald Robertson, Ph.D., Pfizer Global R & D, to speak on "Metabonomics: State of the Science."

Recently, the CIT partnered with the National Center for Food Safety and Toxicology, to present Brian Delaney, Ph.D., DABT, Senior Research Scientist, Pioneer Hi-Bred International, Inc., Johnston, Iowa who gave an overview of the toxicological safety assessment of genetically modified crops.

In April, the CIT presented David Jacobson-Kram, Ph.D., Associate Director, Pharmacology and Toxicology, Office of New Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration. He spoke about safety and toxicology studies in drug development.

Toxicology-related seminars taking place at MSU are announced in the CIT weekly e-mail bulletin "Toxicology Track". To be included on the distribution list, send your e-mail address to furry@msu.edu.

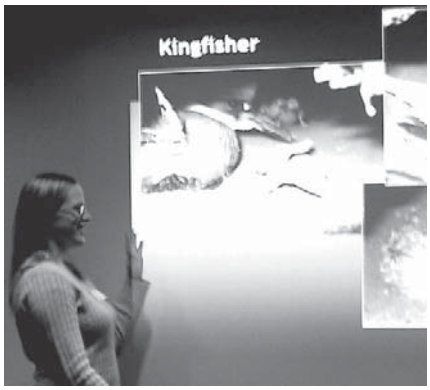
Dale Morris, Pizer Inc., (center) confers with CIT faculty and students.

MSU researchers prominent at SETAC Annual Meeting

CIT-affiliated professor John Giesy and 19 of his students, post docs and technicians attended the 26th Annual Meeting of the Society of Environmental Toxicology and Chemistry, which was held, November 13-17, 2005 in Baltimore, Maryland. The MSU Aquatic Toxicology Laboratory presented 17 papers, which was the largest number of any group in attendance at the meeting. The papers presented are listed below.

"Effects of Pharmaceuticals on Gene Expression and Hormone Production in H295R Cell Line Using Q-RT-PCR/ELISA". T. Gracia, P.D. Jones, K. Hilscherova, K. Higley, J.L. Newsted and J.P. Giesy.

"Mink and PCDD/DFs in the Tittabawasee River". With M. Zwiernik, J. Moore, D. Tazelaar, D. P. Kay, D. Hamman, A. Blankenship and J.P. Giesy.



Rita Seston, doctoral candidate, presented her research on the assessment of PCDFs and PCDDs in the Tittabawassee River basin at the CIT research evening held in December.

"Monitoring of Exposure to and Potential Effects of Contaminants in the Environment". J.P. Giesy, M.H. Depledge, P.K.S. Lam and R.S.S. Wu. Invited, Keynote.

"A Comparison of H295R, R2C and JEG-3 Cells as Screening Tools for Efects on Steroidogenesis". X. Zhang, R.M.K. Yu, P.D Jones, J.L. Newsted, T. Gracia, M. Hecker, R.S.S Wu and J.P. Giesy.

"Avian Toxicity Reference Values (TRVs) for Perfluorooctane Sulfonate (PFOS)". J.L Newsted, P.D. Jones, K. Coady and J.P. Giesy.

"PCDDs and PCDFs in Small Mammals Foraging in the Tittabawassee River Floodplain, Michigan". S.J. Coefield, M.J. Zwiernik, R.M. Seston, T.B. Fredricks, J.N. Moore, D. Tazelaar, D.L. Kay, P.D. Jones, P. Bradley and J.P. Giesy.

"Separation and Characterization pf Structural Isomers of Perfluorinated Compounds". H. Yoo, P.D. Jones, P.W. Bradley, M. Gužviae, B.L. Upham, J.E. Trosko, J.L. Newsted and J.P. Giesy.

"Site-specific Dietary Exposure Assessment of Several Passerine Bird Species to PCDDs and PCDFs". T.B. Fredricks, M.J. Zwiernik, S.J. Coefield, R.M. Seston, J.N. Moore, D.L. Tazelaar, T.C. White, D.P. Kay and J.P. Giesy.

"PCDDs and PCDFs in Aquatic and Terrestrial Food Webs of the Tittabawasee River, Michigan". D.P. Kay, A.L. Blankenship, M.J. Zwiernik, P.D. Jones, J.L. Newsted and J.P. Giesy.

"Tissue Residue Concentratins of PCDDs and PCDFs in Megaloptera: A comparison to Other Benthic Invertebrate Orders". J.N. Moore, C.S. Park, M.J. Zwiernik, D.P. Kay, D.L. Tazelaar, D.W. Hamman and J.P. Giesy.

"Assessment of Belted Kingfisher (Ceryle alcyon) Dietary Exposure to PCDDs and PCDFs in the Tittabawassee River, MI". R.M. Seston, M.J. Zwiernik, J.N. Moore, D.L. Tazelaar, H.L. Wong, P.W. Bradley, T.B. Fredricks, J.J. Coefield, P.D. Jones and J.P. Giesy.

"A Comparison of PCDD and PCDF Bioavailability Among Terrestrial Invertebrates from the Tittabawassee River Floodplain". D.L. Tazelaar, D.P. Kay, M.J. Zwiernik, J.N. Moore, D.W. Hamman, A.L. Blankenship, T.B. Fredricks, R.M. Seston, S.J. Coefield and J.P. Giesy.

"Spatial and Temporal Distributions of Polycyclic Aromatic Hydrocarbons in Sediments from Michigan Inland Lakes". K. Kannan, B. Johnson, S.S. Yohn, J.P. Giesy and D.T. Long.

"Application of In Situ Hybridization to Detect CYP19-A1 and –A2 Gene Expression Patterns Along the HPG-Axis at Different Organizational Levels using Japanese Medaka (Oryzias latipes)". J-W. Park, A. Tompsett, M. Hecker, P.D. Jones, J.L. Newsted and J.P. Giesy.

"Distribution and Sources of Trace Organic Contaminants in Marine Sediment". J.-S. Khim, D. Villeneuve, K. Kannan, J.P. Giesy and C. Koh.

"Dioxin-like and Estrogenic Compounds and Activities Associated With Marine Sediment from Yeongil Bay, Korea". J.-S. Khim, D.L. Villeneuve, K. Kannan, J.P. Giesy and C. Koh.

"Characterization and Distribution of Dioxin-like and Estrogenic Compounds in Sediment from Korean Coasts". J.-S. Khim, D.L. Villeneuve, K. Kannan B. Johnson, J.P. Giesy and C. Koh.