The MSU Center for Integrative Toxicology was well represented at the 51st annual Society of Toxicology (SOT) meeting in San Francisco, California with numerous abstracts presented and many special honors awarded.

The SOT Annual meeting is the largest toxicology meeting and exhibition in the world, attracting more than 7,500 scientists from industry, academia, and government from various countries around the globe. This year’s meeting was held March 11 – 15 at the Moscone Convention Center.

The following students in the MSU-CIT’s Environmental and Integrative Toxicological Sciences (EITS) training program received awards or honors:

...continued on page 2
• **Ashwini Phadnis**, training with Dr. Norbert Kaminski, received the Dr. Harihara Mehendale Graduate Student Best Abstract Award from the Association of Scientists of Indian Origin. She also received the Best Presentation by a Student Award – Second Place from the Immunotoxicology Specialty Section for her presentation titled, “Suppression of activation and altered BCL-6 regulation by 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) in human primary B cells.” Lastly, she received a SOT Graduate Student Travel Award to attend the annual meeting.

• **Weimin Chen**, training with Dr. Norbert Kaminski, received the Charles River Best Abstract Award – 2nd Prize, from the 2012 American Association of Chinese in Toxicology for her abstract titled, “Magnitude of stimulation dictates the cannabinoid-mediated differential T cell response to HIVgp120.” She was also the student representative for the American Association of Chinese in Toxicology (AACT) Special Interest Group of SOT and received funds to travel to the meeting.

• **Angela Dear-dorff**, training with Dr. Cheryl Murphy, received the Graduate Women in Science Rachel Carson Award for Environmental Excellence. Her biography will be posted in the upcoming “Echoes of Silent Spring: 50 Years of Environmental Awareness” exhibit.

• **Kevin Beggs**, training with Dr. Robert Roth, received a Graduate Student Travel Award for his role as the graduate student representative for the Michigan Regional Chapter of the Society of Toxicology. He also served as the Graduate Student Leadership Committee’s (GSLC) secretary this year.

• **Agnes Forgacs**, training with Dr. Timothy Zacharewski, was awarded the Colgate-Palmolive Award for Student Research Training in Alternative Methods. With funds received from the award, Forgacs will travel to the National Center for Computational Toxicology, US Environmental Protection Agency, Durham, North Carolina, to complete work on her project, “High-Throughput Assay Development for Steroidogenesis.” She will work with Dr. Keith Houck to further develop the BLTK1 cell model.

Forgacs also received second place in the Reproductive and Developmental Toxicology Specialty Section Graduate Student Poster Competition for her poster titled, “Atrazine-Mediated Disruption of Steroidogenesis in BLTK1 Murine Leydig Cells.” Lastly, she received a SOT Graduate Student Travel Award to attend the annual meeting.

One undergraduate student and one post-doctoral trainee working with CIT affiliated faculty members also received awards:

• **Alba Katiria Gonzalez Rivera**, an undergraduate student from the University of Puerto Rico-Arecibo, who worked in Dr. Bill Atchison's lab, won the Perry Gehring Award for research by an underrepresented minority student.

• **Rohit Singhal**, Ph.D., who is a post-doctoral trainee with Dr. Robert Roth, was a finalist for the Gabriel L. Plaa Education Award offered through the Mechanisms Specialty Section.

Lastly, affiliated faculty member, **Dr. Barbara Kaplan**, received the prestigious Outstanding Young Investigator Award for the Immunotoxicology Specialty Section. For her contributions to the field of immunotoxicology, including authorship on the chapter titled, “Toxic Responses of the Immune System” in the 7th Ed. of Casarett & Doull’s toxicology textbook.
RESEARCH EVENING 2011 A SUCCESS

The Center for Integrative Toxicology's Annual Research Evening showcased trainees in the Environmental and Integrative Toxicological Sciences Graduate Training Program and their accomplishments. This year’s event took place on Tuesday, November 30, 2011 in the Red Cedar Room at the MSU Kellogg Center. The event included dinner and student poster and platform presentations.

Speakers from left are: Timothy Johnson who presented, “Towards Isolation of Novel Dioxin Degraders;” Erica Sparkenbaugh who presented, “The role of HIF-1alpha in acetaminophen hepatotoxicity;” and Dorothy Tappenden who presented, “The Aryl Hydrocarbon Receptor: How many hats can a transcription factor wear?”

OTHER NOTABLES

At the Fall 2011 Michigan Society of Toxicology meeting held November 4, 2011 at the the Hannah Community Center in East Lansing two CIT students were awarded:

Anna Kopec, post-doctoral trainee with Dr. Timothy Zacharewski, was awarded the Outstanding Postdoctoral Poster Presentation Award for her poster titled, “Toxicogenomic Analysis of Cr(VI) Effects on Intestinal Epithelium in Mice.”

Ashwini S. Phadnis, graduate student training with Dr. Norbert Kaminski, was awarded the Best Graduate Student Poster for her poster titled, “BCL-6, a putative candidate gene involved in 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)-mediated suppression of B cell activation.”

Dr. James Trosko was an awardee of the World Class University Program by the Korean Ministry of Education, Science and Technology. His two-month research leave of absence to the Adult Stem Cell Research Center of Seoul National University was funded by the award.

In a program directed by Dr. Dale Romsos in the department of Food Science and Human Nutrition (FSHN), EITS student Brenna Flannery will perform part of her thesis project abroad this summer in Tanzania. Brenna’s thesis advisor is Dr. Jim Pestka (FSHN). She will be exploring nutritional issues, including mycotoxin contamination of food, in the growth stunting of children that occurs in that region of Africa. Brenna’s travel expenses will be supported, in part, by an International Toxicology Research Travel Award from the CIT.
Over the past year, the MSU-CIT added the following three affiliated faculty members, all of them with previous ties to Michigan State University. These faculty join the CIT as research collaborators as well as contributors to the Environmental and Integrative Toxicological Sciences Graduate Training Program.

**Bryan L. Copple**  
**Associate Professor, Pharmacology and Toxicology**

Dr. Copple received his B.S. in Biology from Morningside College in Iowa in 1991 and Ph.D. in Pharmacology from the University of Nebraska Medical Center in 1997. After pursuing post-doctoral studies at Michigan State University in the Department of Pharmacology and Toxicology, Dr. Copple accepted a position as an Assistant Professor at the The University of Kansas Medical Center Department of Pharmacology, Toxicology and Therapeutics in 2003. He rose to the rank of Associate Professor there in 2010.

Dr. Copple joined the Department of Pharmacology and Toxicology at Michigan State University in the fall of 2011 and is also an affiliated faculty member of the CIT at that time. His research deals with the regulation of inflammation in the liver by early growth response factor-1 (Egr-1) and the role of hypoxia-inducible factors in the development of liver fibrosis.

**James P. Luyendyk**  
**Associate Professor, Pathobiology and Diagnostic Investigation**

Dr. Luyendyk received his B.S. in Biochemistry from Colorado State University in 2000 and Ph.D. in Pharmacology/Toxicology-Environmental Toxicology from Michigan State University in 2004. After pursuing post-doctoral studies at The Scripps Research Institute, Dr. Luyendyk joined the Department of Pharmacology, Toxicology and Therapeutics at The University of Kansas Medical Center in 2007 as an Assistant Professor. There he established a research program funded by the National Institutes of Health and American Heart Association focused on identifying mechanisms whereby coagulation proteases, such as thrombin, contribute to both acute liver toxicity and chronic liver disease.

Dr. Luyendyk joined the Department of Pathobiology and Diagnostic Investigation at Michigan State University as an Associate Professor in March of this year and is also an affiliated faculty member with the CIT shortly thereafter. Dr. Luyendyk continues to focus on identifying novel mechanisms whereby the coagulation cascade contributes to liver disease pathogenesis. Ongoing projects fall under the umbrella of three main themes including 1) identifying mechanisms whereby the coagulation cascade contributes to acetaminophen-induced liver injury, 2) discovering critical gene-environment interactions driving the pathogenesis of fibrosis in autoimmune-mediated cholestatic liver disease, and 3) determining the role of thrombin targets such as protease activated receptor-1 in the pathogenesis of obesity and non-alcoholic fatty liver disease.

**Cheryl E. Rockwell**  
**Assistant Professor, Pharmacology and Toxicology**

Dr. Rockwell received her B.S. in Biology from the University of Michigan and Ph.D. in Pharmacology and Toxicology from Michigan State University. After a Research Associate position at University of Missouri Kansas City for a year, she went on to be a Postdoctoral Fellow with the University of Kansas Medical Center.

Dr. Rockwell joined the Department of Pharmacology and Toxicology at Michigan State University in the fall of 2011 as an Assistant Professor and is also an affiliated faculty member of the CIT at that time. The overall aim of her research is to determine the effect of xenobiotic sensors on the regulation of lymphocyte function. It is her overall hypothesis that, in general, xenobiotic sensors serve to limit lymphocyte response to reactive xenobiotics thus averting exaggerated or inappropriate immune responses that might otherwise cause autoimmunity or other types of inflammatory conditions. Her current research which is funded by an NIH grant from the National Institute for Environmental Health Sciences, focuses on the effects of xenobiotic activation of the transcription factor, nuclear factor erythroid 2 related factor 2 (Nrf2), on T cell function and T cell-dependent immune responses.
The Center for Integrative Toxicology’s Director, Dr. Norbert E. Kaminski, was recently elected vice president-elect for the Society of Toxicology. Kaminski, in addition to his role as CIT Director is a Professor of Pharmacology & Toxicology, and is jointly appointed in MSU’s Colleges of Veterinary Medicine and Human Medicine. His election to this office at the SOT will lead to his serving as vice president and then as president of the society.

“The SOT is a dynamic and continuously evolving global scientific society with membership from all sectors of toxicology, including industry, academia, and government,” said Kaminski. “My goal is to enhance the perception of toxicology as a scientific discipline to those in other areas of science and to the general public.”

The Society of Toxicology (SOT) is a professional and scholarly organization of scientists from academic institutions, government, and industry representing the great variety of scientists who practice toxicology in the US and abroad. SOT is committed to creating a safer and healthier world by advancing the science of toxicology. The organization analyzes the adverse effects of chemical, physical and or biological agents on people, animals, and the environment and currently has a membership of approximately 7,500 scientists.

Research being conducted in Kaminski’s laboratory is in the general areas of immunopharmacology and immunotoxicology and encompasses a number of extramurally funded projects. A major emphasis of all of the projects is the elucidation of the molecular mechanisms for impairment of signal transduction cascades and gene expression during lymphocyte activation by drugs and chemicals. One major research focus is to characterize the mechanism for immune modulation by cannabinoid compounds. This effort has led to the first characterization of cannabinoid receptors within the immune system. Current goals include elucidation of signal transduction events initiated through as well as independently of cannabinoid receptors, including the peroxisome proliferator activated receptor-gamma (PPARγ), leading to aberrant cytokine gene expression by T lymphocytes. A second major research focus is the characterization of the molecular mechanism responsible for altered B cell function produced by halogenated aromatic hydrocarbons, including dioxins and dioxin-like compounds. This research, which resulted in the first characterization of the aryl hydrocarbon receptor (AhR) and aryl hydrocarbon receptor nuclear translocator in B cells, has led us to test the hypothesis that dioxin and dioxin-like compounds suppress antibody responses by impairing B cell differentiation in an AhR receptor-dependent manner.
This spring the MSU-CIT in cooperation with the MSU Neuroscience Program, sponsored the sixth annual Distinguished Scholars in Toxicology Lecture Series, bringing three investigators to the MSU campus who have made substantial scientific contributions to the discipline of toxicology.

The first speaker, Deborah A. Cory-Slechta, Ph.D., visited campus on March 22, 2012. Dr. Cory-Slechta is a Professor in the Department of Environmental Medicine at the University of Rochester School of Medicine. Her research has focused largely on the relationships between brain neurotransmitter systems and behavior, and how such relationships are altered by exposures to environmental toxicants, particularly the role played by environmental neurotoxicant exposures in developmental disabilities and neurodegenerative diseases. She spoke on, "Early Life Exposures to Lead and Prenatal Stress: Consequences for the Central Nervous System."

The second speaker, Tomás R. Guilarte, Ph.D., lectured on March 29, 2012. Dr. Guilarte is a Leon Hess Professor and Chairman in the Environmental Health Sciences at the Mailman School of Public Health at Columbia University. His research focuses on mechanism-based neurotoxicology and neuroscience using behavioral, cellular, and molecular approaches, ranging from studies using primary culture of neural cells to the application of brain imaging technologies. He spoke on, "Synaptic and Cellular Mechanisms of Lead Neurotoxicity."

The third speaker, Jeffrey A. Johnson, Ph.D., visited campus on May 3, 2012. Dr. Johnson is a Professor in the Division of Pharmaceutical Sciences, School of Pharmacy at the University of Wisconsin-Madison. The goals of his research are to determine the potential for Nrf2 to be a viable therapeutic target in the treatment of neurodegenerative disease. He spoke on, "Halting the Progression of Neurodegenerative Diseases: What’s Nrf2 got to do with it?"

All seminars were well received and attended by the MSU toxicology community.
COMPUTATIONAL SYSTEMS BIOLOGY AND DOSE-RESPONSE MODELING SHORT COURSE

The Center for Integrative Toxicology would like to announce a Spring 2012 intensive 3 day short course (May 22-24, 2012) titled "Computational Systems Biology and Dose-Response Modeling". Seats are still available for participants to sign up.

The course comprises lectures and hands-on computer simulation exercises. Students will be required to bring a PC laptop computer each day to the course as there will be computer simulation exercises.

The CIT is offering this course through the Research Translation Core within our NIH Superfund Research Program grant. As part of our ongoing efforts to strengthen interactions between our program and local, state and regional government agencies, we have a limited (4-5) number of seats available that we are able to offer free for non credit. Please contact Ms. Amy Swagart (swagart@msu.edu) for availability.

Other interested individuals, please contact Diane Hummel, hummeld@msu.edu, in the Department of Pharmacology and Toxicology for course registration/override.

Please visit, http://www.thehamner.org/2009-drm-short-course-msu/, for a full description of a previous version of this course. Contact Dr. Norbert Kaminski, kamins11@msu.edu, with questions.

Date: May 22-24, 2012
(All day May 22, 23, 24)

Location: Food Safety and Toxicology Building, room 162

Instructors: Qiang Zhang, Ph.D., Sudin Bhattacharya, Ph.D., and Melvin E. Andersen, Ph.D., Center for Dose Response Modeling, The Hamner Institutes for Health Sciences; Course adviser: Rory B. Conolly, Sc.D., US Environmental Protection Agency

PHM 980, Section 301, 1 credit
(fulfills the EITS Topics in Toxicology requirement)

Course Description: In this short course, you will learn:

» Current computational modeling techniques for quantitative investigation of how biological systems respond to perturbations at the cellular level.

» Common network motifs in signal transduction and gene regulatory networks that underlie systems-level cellular behaviors including homeostasis, adaptation, threshold response, binary and irreversible cell fate decisions, and oscillations.

» How molecular circuits comprising genes and proteins give rise to various dynamic and dose-response behaviors. Examples include cellular stress response, cell differentiation, and cell cycle and checkpoint control, etc.

» To use these techniques to develop computational models for understanding and predicting nonlinear dose response behaviors of drugs and environmental agents.