CIT PARTICIPATES IN 50TH ANNUAL SOT MEETING IN D.C.

The MSU Center for Integrative Toxicology was well represented at the 50th Annual Society of Toxicology (SOT) Meeting held in Washington, D.C. 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 8,000 scientists from industry, academia, and government from various countries around the globe. This year’s meeting was held March 6 – 11 at the Walter E. Washington Convention Center.

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

- **Peer Karmaus**, training with Dr. Norbert Kaminski, received Best Presentation by a Graduate Student, 2nd place, from the Immunotoxicology Specialty Section for his presentation, “Δ9-Tetrahydrocannabinol Decreases Dendritic Cell Immune Responses after Influenza Infection in vivo and Toll-like Receptor Stimulation in vitro.”

- **Brenna Flannery**, training with Dr. James Pestka, received the Burdock Group Travel Award from the Food Safety Section. She was also elected Graduate Student Representative for the Food Safety Section.

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The Center for Integrative Toxicology's Annual Research Evening showcased trainees in the Environmental and Integrative Toxicological Sciences Training Program and their accomplishments. This year's event took place on Tuesday, November 30, 2010 in the Red Cedar Room at the MSU Kellogg Center. The event included dinner and student presentations.

Speakers from left are: Brenna Flannery who presented, "Characterization and Mechanisms of Deoxynivalenol-Induced Feed Refusal in the Mouse," Peer Karmaus who presented, "The Role of Dendritic Cells in Delta-9-Tetrahydrocannabinol-Mediated Modulation of the Immune Response to Influenza;" and Michelle Angrish who presented, "The Role of Stearoyl-CoA Desaturase-1 in TCDD-Induced Fatty Liver."

**RESEARCH EVENING 2010 A SUCCESS**

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**ATCHISON HONORED AS DISTINGUISHED FACULTY**

CTI-affiliated faculty member Dr. William D. Atchison, professor in the Department of Pharmacology and Toxicology and current Acting Associate Dean for the College of Veterinary Medicine, was recently honored as a MSU Distinguished Faculty Award winner. Atchison received his award during the annual Awards Convocation held February 8, 2011 at Wharton Center’s Pasant Theatre. Atchison and 19 other award winners were presented their awards and commended by MSU President Lou Anna K. Simon.

Established in 1952, the Distinguished Faculty Award tradition-ally is bestowed upon professors of the University who have made distinguished and widely rec-ognized contribu-tions to their fields, who have made significant contributions to MSU and its pro-grams, and who represent and reflect the character and qualities of excellence valued at Michi-gan State University.

Dr. Atchison’s research focuses on the toxic effects of heavy metals on the functioning of nerve cells and on the cellular basis for diseases of the neuro-muscular junction. His research program has been consistently funded by the National Institutes of Health, the gold standard of biomedical research. In ad-dition to presenting his research around the globe at numerous conferences and meetings, Atchison has also published nearly 100 peer-reviewed scientific ar-ticles.

One of his most recognized achieve-ments to date has been the creation of a program to promote student diversity in the biomedical sciences. He received a $1.5 million grant for this program titled, “Increased Training of Hispanic Neuro-scientists at Michigan State University.” The grant, through the National Institute of Neurological Disorders and Stroke (NINDS) provides funding to increase the number of Hispanic Ph.D.’s trained in the neurosciences, specifically, to facilitate the entry of students into the Ph.D. program in Neuroscience at MSU and enhance their likelihood of success in the program.

Says Atchison in the official MSU press release: “I am honored to be chosen for this prestigious award and indebted to the colleagues and former students who advanced my candidacy. One does not receive an award such as this based on their own accomplishments, but rather by having the opportunity to work with, mentor and lead outstanding people. I have truly been fortunate in this regard, and this award reflects these individuals contributions and accomplishments.”
Dr. William Bowerman, former CIT student, was recently appointed United States co-chairman of the Great Lakes Science Advisory Board for the United States-Canada International Joint Commission. The United States and Canada created the International Joint Commission in 1909, to find solutions to problems in the waters and ecosystems that share their borders. The Science Advisory Board advises the commission on scientific research and matters relating to air and water quality and ecosystem health in the Great Lakes Region, about 1/5 of the world's fresh water supply.

Dr. Bowerman graduated from MSU in 1993 with a Ph.D. in Fisheries and Wildlife – Environmental Toxicology. His dissertation titled, “Regulation of Bald Eagle (Haliaeetus leucocephalus) Productivity in the Great Lakes Basin: An Ecological and Toxicoecological Approach,” was under the direction of Dr. John Giesy.

Today, as a professor of environmental toxicology and wildlife ecology at Clemson University, his work continues to focus on the study of birds to indicate the health of the environment. Much of his work has concentrated on bald eagles in the Great Lakes Region, as well as sea eagles from around the globe. As new US co-chair of the Great Lakes Science Advisory Board, Bowerman’s studies of bald eagle populations as an indicator of ecosystem health will be important to the commission’s ongoing assessment of progress toward restoration of the chemical, physical and biological integrity of the Great Lakes Basin.

Alumni HIGHLIGHTS

Alumnus William Bowerman Appointed Co-Chair of the Great Lakes Science Advisory Board

SOT MEETING CONT.

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- Agnes Forgacs, training with Dr. Tim Zacharewski, received a monetary poster award from the Reproductive and Developmental Toxicology Specialty Section for her poster, “Effect of triazines on testosterone biosynthesis in BLTK1 murine Leydig tumor cells.” She also received honorable mention from the Molecular Biology Specialty Section for her poster, “Comparing TCDD-elicited gene expression profiles in human, mouse and rat primary hepatocytes.”

- Kevin Beggs, as the graduate student representative for the Michigan Regional Chapter of SOT, received funds to travel to the annual meeting. Beggs is training with Dr. Robert Roth.

- Jingtao Lu, training with Dr. Patricia Ganey, received a monetary travel award as the student representative for the Comparative and Veterinary Specialty Section (CVSS).

- Michelle Angrish, training with Dr. Tim Zacharewski, received honorable mention for the Carl C. Smith Mechanisms award for her poster, “AhR-mediated regulation of hepatic lipid metabolism”.

The following students also received travel awards from the SOT:
- Erica Sparkenbaugh
- Aaron Fullerton
- Weimin Chen
- Jingtao Lu

Two undergraduate students working with CIT-affiliated professors also received awards at the conference:

- Ericka Valez, an undergraduate from the University of Puerto Rico at Cayey, who worked with Dr. Barbara Kaplan, received travel funds to the SOT meeting from the Committee on Diversity Initiatives for being an “Honorable Mention” for the Perry J. Gehring Diversity Student Travel Award.

- Viviana Vidal Anaya, an undergraduate from the University of Puerto Rico at Cayey, who worked with Dr. Bill Atchison, received the Pfizer Undergraduate Student Travel Award for her abstract titled, “Different Susceptibilities to MeHg-Induced Cell Death between Non-Neuronal and Neuronal Cells”.

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The MSU-CIT Superfund Research Program in cooperation with the National Institute for Environmental Health Sciences (NIEHS) successfully hosted a workshop this past November on the NIEHS campus titled, “Health Consequences from Xenobiotic – Gut Microbiome – Host Interactions.” Over 80 participants attended the workshop from industry, government and academia.

During the workshop, a broad interdisciplinary group of scientists discussed existing research on the gut microbiome – the microbial communities inhabiting the human digestive tract or gut – and focused on interactions between gut-associated microbes and environmental contaminants and the untoward consequences of these interactions on human health. The workshop explored the role of interactions between environmentally relevant xenobiotic agents with gut-associated microbes that either increase or decrease the risk or severity of various human diseases.

After opening introductions by CIT Director Norbert Kaminski, Ph.D., and SRP Director William Suk, Ph.D., the workshop began with a presentation from keynote speaker, Jeffrey I. Gordon, M.D., Washington University, who is a leading scientist in the investigation of the microbiome. Dr. Gordon spoke on “The human gut microbiome – dining in with trillions of fascinating friends,” which set the tone for discussions on the enormity and complexity of the landscape of the microbiome.

Gordon’s presentation was followed by talks from an interdisciplinary group of key scientists with a broad range of knowledge on the microbiome. (Speakers at left).

Three breakout sessions helped participants to generate discussion on the information presented and focused on three important questions:

- What is the state of current knowledge about the composition of the gut microbiome, and what leading edge technologies and approaches are being used to advance the science?
- How does the gut microbiome influence disease and health of the host?
- How do interactions between xenobiotics and the gut microbiome affect toxic responses?

The conclusion of the workshop included summations by breakout group facilitators and speakers. A paper will be published in the coming months with the conclusions from the workshop for the scientific community.

Jeffrey I. Gordon, M.D.,
Washington University
“The human gut microbiome – dining in with trillions of fascinating friends.”

Patricia E. Ganey, Ph.D.,
Michigan State University
“Microbial products enhance xenobiotic-induced liver injury”

Robert L. Hettich, Ph.D.,
Oak Ridge National Laboratory
“Integrating metagenomics with metaproteomics for comparing the molecular activities of the human distal gut microbiome in healthy vs. Crohn’s diseased individuals”

Gary B. Huffnagle, Ph.D.,
University of Michigan
“Regulation of mucosal immunity by the indigenous microbiota”

David A. Relman, M.D.,
Stanford University
“Stability and responsiveness of the human gut microbiota”

Arlin B. Rogers, D.V.M., Ph.D.,
University of North Carolina
“The influence of gut microbes on extraintestinal cancers”

Vincent B. Young, M.D., Ph.D.,
University of Michigan
“Structure and function of the indigenous gut microbiota”

Dr. Jeffrey Gordon from Washington University was the keynote speaker for the workshop speaking on, “The human gut microbiome - dining in with trillions of fascinating friends.”
CIT Director Dr. Norbert Kaminski opens the workshop, “Health Consequences from Xenobiotic - Gut Microbiome - Host Interactions on November 17, 2010 at the NIEHS campus in Research Triangle Park, North Carolina.

Dr. Gordon answers questions from the audience as Dr. James Tiedje, CIT-affiliated professor moderates the Q&A session.

Dr. Barbara Kaplan, CIT-affiliated faculty member, summarizes conclusions from a breakout session.
This past year the MSU-CIT along with the Department of Food Science and Human Nutrition, sponsored the fifth annual Distinguished Scholars in Toxicology Lecture Series, bringing two investigators to the MSU campus who have made substantial scientific contributions to the discipline of toxicology.

The first speaker, Felicia Wu, Ph.D., came to campus on November 2, 2010. Dr. Wu is an Assistant Professor of Environmental and Occupational Health at the University of Pittsburgh. A mathematician and policy analyst by training, she moved into the area of foodborne mycotoxins as the result of her work at the US Environmental Protection Agency on the benefits and risks of genetically modified Bt corn. She spoke on, “Global Burden of Human Disease Caused by Foodborne Aflatoxin.”

The second speaker, Timothy D. Phillips, Ph.D. lectured on April 6, 2011. Dr. Phillips is a Professor of Veterinary Integrative Biosciences at the College of Veterinary Medicine at Texas A&M University. He spoke on, “Enterosorbent therapy for populations at risk for aflatoxicosis.”

Both seminars were well received and attended by the MSU toxicology community.
HARKEMA LEADS NEW CLEAN AIR RESEARCH CENTER AT MSU

Dr. Jack Harkema, CIT-affiliated professor and a University Distinguished Professor of pathobiology and diagnostic investigation will lead the new Clean Air Research Center here at MSU. The center is one of four Clean Air Research Centers funded by the Environmental Protection Agency (EPA). These new centers aim to study a range of exposures to air pollution sources and their health effects across different life stages, among susceptible and vulnerable populations, and across communities where exposures may be of greater health risk. Other centers will be located at Harvard University, University of Washington, and Emory University and Georgia Institute of Technology.

The five year, $8 million grant given to MSU will fund three major research projects with the creation of the Great Lakes Air Center for Integrative Environmental Research. The research team comprised of investigators from the University of Michigan and Ohio State University as well as MSU, will study the role air pollutants, specifically fine particles and ozone, have on cardiometabolic syndrome. Cardiometabolic syndrome affects about one third of adult Americans and includes people who suffer from high blood pressure, diabetes and obesity.

“In tandem, cardiometabolic syndrome and air pollution threaten human health worldwide,” says Harkema in the official MSU press release. “We propose that not only are individuals with pre-existing abnormalities at greater risk for health effects of air pollution exposure but that air pollution itself may promote the development of cardiometabolic syndrome.”

MSU’s center will utilize two mobile air research laboratories, basically semi-trucks equipped with a mobile air laboratory with tools that can concentrate air pollutants in real time. A variety of students from all levels of training will be helping the team conduct research.

STUDENT NOTABLES

Peer Karmaus was an invited speaker at the National Graduate Student Symposium at St. Jude in Memphis. He spoke on, “Targeted Deletion of Cannabinoid Receptors 1 and 2 Exacerbates Antigen Presenting Cell Function Thereby Enhancing Immune Responses to Influenza Infection.” Forty trainees out of 1,200 applicants were invited to participate.

Kevin Beggs, was recently elected to be the Secretary for the Graduate Student Leadership Committee (GSLC), formerly the Student Advisory Council (SAC).

EITS students swept the graduate student poster competition this past year at the Fall Michigan Society of Toxicology Meeting:

- Michelle Angrish, received 1st place for her poster titled, “The role of Scd1 in TCDD-induced fatty liver.”
- Kyle Poulsen, received 2nd place for his poster titled, “Trovafloxacin potentiates LPS-induced TNFα expression in a macrophage cell line.”
- Agnes Forgacs, received 3rd place for her poster titled, “Comparing TCDD-elicited gene expression profiles in human, mouse and rat primary hepatocytes.”

Photos in this newsletter provided by:  
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