



### In this issue

Message from the Director .....2  
Student Spotlight .....3  
New Affiliates .....4  
Recent Events .....6  
Superfund Dioxin Workshop .....7  
CIT Annual Research Eve .....8

### Center for Integrative Toxicology

Michigan State University  
165C Food Safety and Toxicology  
East Lansing, MI 48824  
517/353-6469 Fax: 355-4603

**Norbert Kaminski**  
Director  
Lois Furry  
Editor  
[www.cit.msu.edu](http://www.cit.msu.edu)  
E-mail: [tox@msu.edu](mailto:tox@msu.edu)



### 2008 Society of Toxicology Meeting

## CIT's EITS Students Take Top Honors

The MSU Center for Integrative Toxicology was highly visible at the 2008 Society of Toxicology (SOT) meeting with over 50 abstracts presented and numerous special honors.

The SOT Annual Meeting is the largest toxicology meeting in the world, attracting approximately 6,200 scientists from industry, academia, and government. This year's event was held in Seattle, Washington.

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

- Xiaomin Deng, working in the lab of Robert Roth, received a travel award.

- Christine Dugan, working in Patricia Ganey's lab, received a travel award from the Toxicologic and Exploratory Pathology Specialty Subsection as well as a travel award from the MSU Council of Graduate Students.

- Anna Kopec, who works in Timothy Zacharewski's lab, was chosen for the Toxicological Sciences cover illustration. The Journal is the official journal of the Society of Toxicology and this was Kopec's first publication.

- Haitian Lu, working in the lab of Norb Kaminski, received the Colgate-Palmolive Research Fellowship. The award is designed to promote training

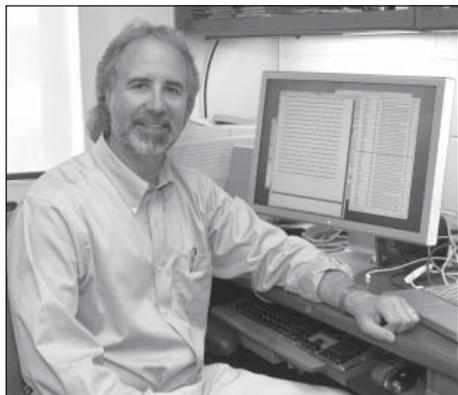
**SOT Awards, continued on page 2**



Environmental and Integrative Toxicological Sciences trainees who received awards or honors included (from left) Christine Dugan, Xiaomin Deng, Anna Kopec, Haitian Lu, Erica Sparkenbaugh, Patrick Shaw, and Wei Zou. Not pictured: Jennifer Phillips.



# Message from the Director



As another academic year draws to a conclusion, the CIT continues to expand.

During the past year, the CIT has welcomed six MSU faculty to its list of affiliates. These faculty are all newer to MSU and have research interests in toxicology. In addition, an adjunct faculty member also was recruited for affiliation with the CIT. We are delighted to welcome our new colleagues to the CIT and look forward to research collaborations as well as their contributions to the training of students in toxicology.

At the 2008 Society of Toxicology Annual Meeting, the CIT's Environmental

and Integrative Toxicological Sciences trainees distinguished themselves with numerous awards and honors, including the Colgate-Palmolive Research Fellowship Award.

We are immensely proud of our trainees and their achievements. In total, over 50 papers were presented by MSU faculty and students at this year's SOT Annual Meeting.

The second annual Distinguished Scholars in Toxicology Lecture Series was held in cooperation with the Department of Biochemistry and Molecular Biology. This year Timothy Ryan from the Lilly Research Laboratories, and Joel Pounds, from Pacific Northwest National Laboratory spoke. Both scholars had informal meetings with CIT trainees to answer career and research questions. The MSU Graduate School provides financial support for the lecture series.

The MSU-CIT Superfund Program's Research Translation Core has planned a second workshop related to dioxins. Scheduled for October 21-22, 2008 at the MSU Kellogg Center, the workshop will focus on the mechanisms, models and potential health risks of dioxin and

dioxin-like compounds. Three topic sessions will be held: Ah Receptor Biology, Secondary Signaling Mechanisms involving the Ah Receptor, and Computational Modeling and Risk Assessment.

A previous workshop on the international policy implications and impact of dioxin was hosted by the MSU CIT Superfund Program in the fall of 2007. Video recordings of the presentations are available on the CIT web site at <http://www.cit.msu.edu>.

Also, in late Fall of 2007, the CIT hosted its annual research evening for faculty and students. Three students were selected to give oral presentations and numerous trainees participated in poster presentations of their research.

This academic year was an exciting and successful time for the toxicology community at MSU and we look forward to your continued partnership and support.

*Norbert Kaminski*

## Society of Toxicology Honors, Continued from page 1

in alternative non-animal research. He will use part of the funding to train in the lab of Russell Thomas at the Hamner Institutes for Health Sciences. Thomas is one of the investigators working in the CIT's Superfund Basic Research Program. Lu was also honored with the best presentation by a student award from the Immunotoxicology Specialty Section.

- Jennifer Phillips, working in the lab of Jay Goodman, received a poster award from the Regulatory and Safety Evaluation Specialty Section.

- Pat Shaw, who works in the lab of Robert Roth, received a travel award and First Place of Graduate Student Posters for the Comparative and Veterinary Specialty Subsection. The award included a \$500 prize and a plaque.

- Erica Sparkenbaugh, working in

Robert Roth's Lab, received a travel award.

- Wei Zou, working in the lab of Robert Roth, received a travel award and Second Place for his graduate student presentation from the Comparative and Veterinary Specialty Subsection.

Eighteen students received travel support to attend and present at the meeting through the MSU Graduate Office Fellowship Funding or EITS Program Support.

Several MSU Summer Undergraduate Research Fellows were also honored at the meeting. Billie Pace-Gracyk, an undergraduate at Drake University, who worked in William Atchison's lab, received a travel award. Franscheska Vega and Angela Rivera, both of the University of Puerto Rico, worked in Atchison's lab as part of the Ronald B.

McNair Summer Research Opportunity Program, and also received travel awards. The same was true for Jose Suarez, who worked in Kaminski's lab. Vega and Suarez both presented posters based on their summer projects.

In addition, two MSU-CIT EITS scientists were honored with first place awards at the Fall 2007 Regional Meeting of the Michigan Society of Toxicology.

- Patrick Shaw, working in the lab of Robert Roth, was the first place graduate student for his poster presentation.

- Pavel Babica, working in Brad Upham's lab, received the post-doctoral/research assistant first place award.

Christopher Dean, a biochemistry graduate student working in the lab of Karl Olson, received an Honorable Mention Poster Award.

## Student Spotlight

# Lu Captures SOT's Colgate-Palmolive Research Fellowship

CIT student Haitian Lu was this year's recipient of the prestigious Colgate-Palmolive Research Fellowship at the 2008 Society of Toxicology Annual Meeting.

Lu is a doctoral student in the CIT's Environmental and Integrative Toxicological Sciences (EITS) training program with a dual degree in EITS and the Department of Pharmacology and Toxicology.

Lu began considering toxicology at the undergraduate level. He worked in a government environmental lab using aquatic toxicology model organisms to establish emission standards. He found the work fascinating because it integrated many disciplines. He found the work satisfying because it had a useful purpose.

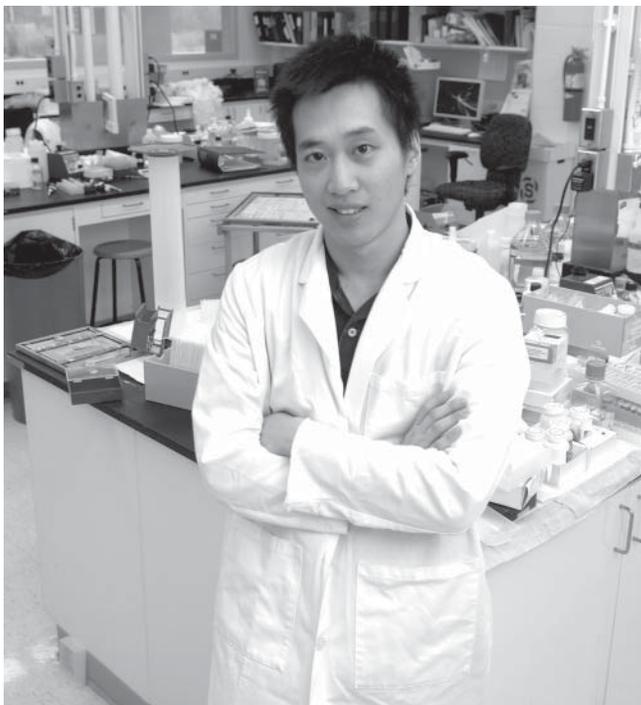
He completed a B.S. in environmental biology at Nanjing University in China. Continuing his studies at the graduate level seemed a natural course.

His graduate career has been exceptionally productive. While completing his masters in environmental science at New York University, he published no less than six peer-reviewed papers.

Lu planned to continue his studies at NYU in environmental sciences, but found himself drawn again to toxicology. He knew of MSU's program in toxicological sciences and also knew that MSU was well represented at scientific meetings. When an immunologist he knew, recommended him to Norb Kaminski, he came for an interview on the MSU campus and soon after joined the Kaminski Lab.

Initially, Lu was involved with research related to the immunotoxicology of cannabinoids. However, he elected to become involved in a dioxin-related project in collaboration with the Dow Chemical Company.

This project involves conducting cross-species (mouse and human) comparisons in order to access the



considers the opportunity a dream project.

"There is a lot of historical toxicology data from mouse studies," he said. "This is an opportunity to study the effects of a toxicant on human primary lymphocytes."

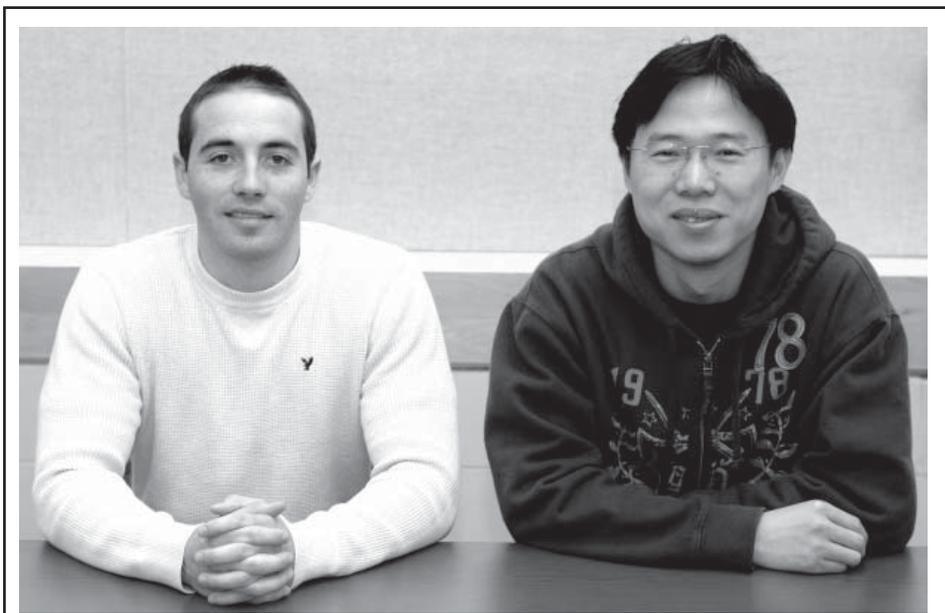
The research was key in landing him the prestigious Colgate-Palmolive Research Fellowship. The award is designed to promote training in alternative non-animal research.

He will use part of the funding to train in the lab of Russell Thomas at the Hamner Institutes for Health Sciences. Thomas is one of the investigators working in the CIT's Superfund Basic Research Program.

sensitivity of B-cell differentiation to impairment by dioxin-like compounds, utilizing an in vitro-activation model system. The research uses B cells obtained from human blood samples. After the Kaminski lab generated preliminary data, Dow became interested in funding the project. Lu

Lu also was honored with the best presentation by a student award from the Immunotoxicology Specialty Section at the SOT annual meeting.

He hopes to pursue a career in the chemical or pharmaceutical industry. Once he gains some professional experience, he plans to return to China.



**Patrick Shaw (left) and Xiaomin Deng, both CIT Environmental and Integrative Toxicological Sciences trainees working in Robert Roth's Lab, received best paper awards at the multi-society, scientific Experimental Biology 2008 Annual Meeting.**

Meet the faculty

# Toxicologists welcomed as new CIT affiliates

Over the past year, the MSU-CIT added the following six faculty to its list of affiliates. One adjunct professor has also joined the center. These faculty join the CIT as research collaborators as well as contributors to the Environmental and Integrative Toxicological Sciences training program.



**Andrea Amalfitano**  
**Professor, Departments of Pediatrics**  
**and of Microbiology and Molecular Genetics;**  
**Osteopathic Heritage Foundation Endowed Chair.**

One important problem with introduction of genetic material into a living organism is triggering of the innate immune response. Amalfitano's recent work has begun to identify key components of the multi-faceted innate immune system, guiding future efforts to subvert these systems to allow for safer gene transfer. Many of these same systems are also involved in toxic responses to other pathogens as well as to other medicinal or environmental agents. He is working to develop vector technologies and address the toxicities associated with gene transfer, for use in a variety of clinically important situations. These studies are aimed at determining the ability of gene transfer to prevent, minimize, and/or cure diseases affecting the liver, eye, hearing apparatus, muscles, heart, coronary arteries, as well as its ability to improve certain aspects of cancer therapies.



**John L. Goudreau**  
**Director, Translational Neurobiology Research Unit;**  
**Associate Professor, Departments of Neurology**  
**and of Pharmacology and Toxicology.**

Goudreau's research is concerned with neuroprotective treatments of Parkinson's disease with a major emphasis on the mechanisms responsible for the degeneration of nigrostriatal dopamine neurons. More recently, Dr. Goudreau's laboratory has also begun to consider environmental factors that may contribute to the etiology of Parkinson's disease. In addition, genome-wide mRNA expression profiling is used to identify changes in expected and novel gene expression. Novel potential candidate genes will be screened for disease-predisposing polymorphisms in patients with Parkinson's disease.



**Laura R. McCabe**  
**Associate Professor, Departments of Physiology**  
**and of Radiology.**

McCabe's research interests are focused on identifying mechanisms regulating bone formation by osteoblasts. Her laboratory employs a wide variety of approaches including the examination of transcription factor activity and intracellular signaling pathway activation. She also utilizes stem cell lineage selection, apoptosis, metabolism, as well as immune system contributions utilizing cell culture systems, animal models, and human imaging, to study mechanisms regulating bone formation.

.....  
**Cheryl A. Murphy**  
**Assistant Professor, Environmental Toxicology**  
**Department of Fisheries and Wildlife, Lyman Briggs College.**

Murphy's research is motivated by the question: how does information translate across different scales? Using fish as a model organism, she is working to synthesize information collected on individuals and use this information to answer questions at a higher level of organization such as, how do changes in the physiological processes occurring within an individual translate to behavioral changes and ecologically relevant endpoints, how do short term phenotypic changes in life history traits alter long term genetic change, and how do anthropogenic influences such as contaminants impact such relationships and affect populations or communities of fish? Her overall goal is to bridge laboratory work with field sampling and modeling to address issues in environmental toxicology.



**Hui Li**  
**Assistant Professor, Department of Crop and Soil Sciences.**

An environmental soil chemist, Li's research has an emphasis on investigating the environmental physicochemical processes and ecological impacts of organic contaminants containing complex structures, and applying these basic findings to minimize negative impacts on the environment. He studies the environmental fate, transport and effects of emerging contaminants associated with animal manures, composts and biosolids, to develop agricultural practices that reduce any negative effects on land and water. Li was appointed to MSU in 2005 and is a co-investigator in the MSU Superfund Basic Research Program, administered through the CIT.



**A. Daniel Jones**  
**Director, Mass Spectrometry Facility**  
**Professor, Departments of Chemistry**  
**and of Biochemistry and Molecular Biology.**

Jones's research interests lie in improving mass spectrometry and separation strategies and applying them to perform global profiling of metabolites. This approach, known as metabolomics, probes the influence of genetics and the environment on rates of biosynthesis and degradation of metabolites. Such measurements lie at the heart of systems biology approaches for engineering plants and microorganisms for improved productivity, as biosensors, and as valuable sources of an assortment of bioactive chemicals. Furthermore, the information in the metabolome can be used as biomarkers of stress, toxicity, and disease.



**Michael R. Woolhiser**  
**Adjunct Professor, Center for Integrative Toxicology**  
**Toxicology Specialist, The Dow Chemical Company**

Woolhiser received his Ph.D. in pharmacology and toxicology, from the Medical College of Virginia/Virginia Commonwealth University. He has been a senior toxicology specialist at The Dow Chemical Company in Midland since 2004. He is an MSU alumni and previously conducted research in the Department of Pharmacology and Toxicology.

# Recent Events

## Distinguished Scholars in Toxicology Lecture Series

The MSU-CIT recently sponsored the second annual Distinguished Scholars in Toxicology Lecture Series, bringing individuals to the MSU campus who have made substantial scientific contributions to the discipline of toxicology.

Each year, the CIT partners with an affiliated academic unit to select and host the speakers. The Department of Biochemistry and Molecular Biology participated and the following speak-

ers were invited: Timothy Ryan, Ph.D., Lilly Research Laboratories and Joel Pounds, Ph.D., Pacific Northwest National Laboratory.

Environmental and Integrative Toxicological Sciences trainees lunched with the speakers and meet with them in labs following the lectures.

The series is supported with funding from the MSU Graduate School.



**Timothy Ryan (left)** a Senior Research Advisor in the Department of Integrative Biology at Lilly Research Laboratories, spoke with MSU faculty and students following his lecture on "Leveraging Gene Expression Data In Pharmacology and Toxicology: Functional Genomics in Drug Discovery."



**Joel Pounds, a Senior Staff Scientist in Cell Biology & Biochemistry, Biological Sciences Division, and Science Advisor to the Environmental Biomarkers Initiative, at the Pacific Northwest National Laboratory in Richland, Washington lectured on "Systems Toxicology of Engineered Nanomaterials." He is pictured (standing) while meeting informally with the EITS trainees working in Timothy Zacharewski's lab.**



**The DuPont Scientists Scott Loveless (far left), Director of Human Health Services, and Robert Rickard, DuPont Distinguished Scientist, presented on the internal dose approach to risk assessment of perfluorooctanoic acid. The scientists met with EITS students afterwards to further discuss DuPont research and career possibilities in industry.**

## Notables

- **William Atchison**, CIT faculty affiliate and **Norbert Kaminski**, were recently recognized as 25-year members of the Society of Toxicology.
- **Colleen Hegg**, CIT faculty affiliate, received the American Physiology Society Shih-Chun Wang Young Investigator Award at the April Experimental Biology meeting.
- **Patricia Ganey**, CIT faculty affiliate, was recently elected to serve as Councilor to the Society of Toxicology.
- **Norbert Kaminski**, CIT Director, received the Distinguished Service Award from the Society on NeuroImmune Pharmacology at their April 2008 Annual Meeting.
- **James Lyendyk**, EITS Ph.D. Alumni of 2004, recently accepted a position as assistant professor of pharmacology, toxicology and therapeutics at the University of Kansas Medical Center.
- **James Wagner**, CIT faculty affiliate was recognized for his service as outgoing councilor for the Inhalation and Respiratory Specialty Section of the Society of Toxicology.

## MSU Superfund Program Workshop

# Dioxin Toxicity: Mechanisms, Models, & Potential Health Risks

The MSU-CIT Superfund Basic Research Program (SBRP) will host a second workshop related to dioxins October 20-21, 2008 at the MSU Kellogg Center.

As part of the SBRP grant to MSU from the National Institute of Environmental Health Sciences, this event is being provided free-of-charge to all participants.

The workshop, being planned by the Research Translation Core of the MSU Superfund Program, will focus on the mechanisms, models and potential health risks of dioxin and dioxin-like compounds. Three topic sessions will be held: Ah Receptor Biology, Secondary Signaling Mechanisms involving the Ah Receptor, and Computational Modeling and Risk Assessment.

A final panel discussion will be held with participation from attending scientists as well as the workshop's invited speakers. The event will conclude with lunch on Wednesday, October 21.

Poster abstracts are being sought. The deadline for submission is June 20, 2008. Seating for the workshop is limited. Registrations are requested by October 1, 2008.

The planned schedule of presentations is as follows:



October 20, 2008

### Ah Receptor Biology:

- Christopher A. Bradfield, Ph.D.,  
University of Wisconsin-Madison
- Shigeaki Kato, Ph.D.,  
The University of Tokyo
- Russell S. Thomas, Ph.D.,  
The Hamner Institutes for Health Sciences

### Secondary Signaling Mechanisms:

- John J. LaPres, Ph.D.,  
Michigan State University
- Richard S. Pollenz, Ph.D.,  
University of South Florida
- Gary H. Perdew, Ph.D.,  
Pennsylvania State University

October 21, 2008

### Computational Modeling and Risk Assessment:

- Rory B. Conolly, Sc.D.,  
U.S. Environmental Protection Agency
- J. Craig Rowlands, Ph.D.,  
Dow Chemical Company
- Thomas B. Starr, Ph.D.,  
TBS Associates

The MSU-CIT Superfund Program previously held a one-day conference on September 19, 2007 to review and exchange ideas concerning dioxin and dioxin-like compounds.

The 2007 workshop focused on reviewing the findings and conclusions reached by a National Academy of

Science (NAS) committee charged with reviewing the U.S. Environmental Protection Agency (EPA) reassessment of dioxin as well as the World Health Organization (WHO) Committee on Toxic Equivalency Factors for dioxin-like compounds. Accordingly, the speakers included key internationally recognized dioxin experts who represented the NAS, WHO, and EPA.

The proceedings of the 2007 workshop are available on the CIT web site at <http://www.cit.msu.edu/Superfund/Dioxin%20Workshop.html>.

---

### Save the Date:

October 20-21, 2008

Michigan State University  
Kellogg Center

Seating limited. Registration requested by **Oct. 1, 2008.**

For hotel accommodations, call 517-432-4000.

Poster abstracts requested.  
Deadline: **June 20, 2008.**

---

**For more information:  
Visit our Website!**



<http://www.cit.msu.edu>

.....

# MSU-CIT Annual Research Evening: Presentations and Posters

The MSU Center for Integrative Toxicology Annual Research Evening showcased the research of numerous Environmental and Integrative Toxicological Sciences trainees. Pictured at right: Rashad Simmons (left), chemistry trainee, Becky Bae (middle), food safety trainee, and John Buchweitz (right) recent graduate, all made formal presentations. In addition, many trainees presented posters including Dorothy Tappenden (photo below, right) biochemistry and molecular biology trainee, and Priya Raman (photo at bottom), pharmacology and toxicology trainee.

