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The University of Georgia

Spring/Summer 2008



The Interdisciplinary Toxicology Program at the University of Georgia is comprised of graduate students, faculty, and post-doctoral fellows from several departments within the University. The program is committed to a high quality graduate education and excellence in research. Both faculty and graduate students have received national recognition for their endeavors. Our goal is to provide strong interdisciplinary graduate training, research and service programs in toxicology. This is accomplished by encouraging cooperation and sharing of resources and faculty in the College of Veterinary Medicine, the College of Pharmacy, the College of Agricultural and Environmental Sciences, Warnell School of Forestry and Natural Resources and the College of Public Health.

Interdisciplinary Toxicology Program
DIGEST

www.toxicology.uga.edu
toxinfo@uga.edu

1 Introduction

Greetings Fellow Toxicologists,

Welcome to our 2008 edition of the toxicology newsletter. I am excited to report that our curriculum offerings to graduate students are expanded with Dr. Xiaoqin Ye teaching a Molecular Toxicology class. The Interdisciplinary Toxicology Program and the department of Physiology and Pharmacology in Veterinary Medicine joined together to create this position. Also, Dr. Steve Rathbun, of the Department of Epidemiology and Biostatistics in the College of Public Health, offered a graduate class in Biostatistics Spring semester of 2008.

2 Fall Social Seminars

3 Spring Retreat

I would like to welcome several new members: Dr. Robert Bringolf joins us from North Carolina State, Dr. Xiaoqin Ye from the Scripps Research Institute in La Jolla, CA, and Dr. Jason Zastre from the University of Toronto.

4 Program Support

Congratulations to Dr. Erin Lipp, who received a 5-year graduate student training grant from National Oceanic and Atmospheric Administration (NOAA). The Georgia Ocean's and Health Initiative will train Ph.D. students focused on human pathogens, toxic contaminants and climate change with opportunities to conduct research in federal NOAA laboratories.

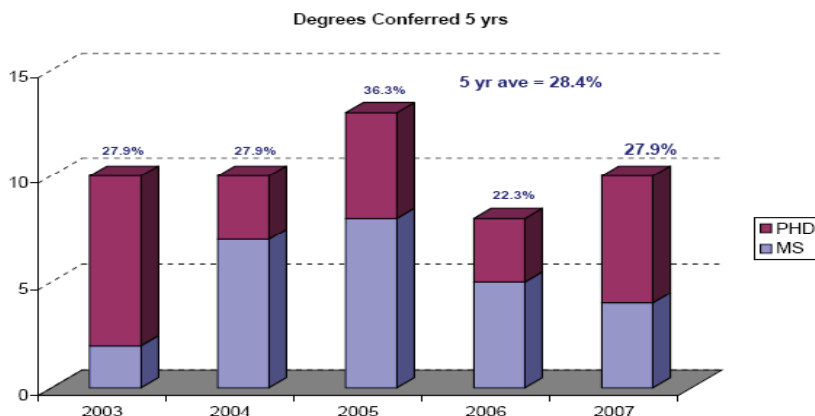
6 Professional Societies

Our MS and Ph.D. students are graduating within expected time frames of 2-2.5 years for MS and 4-5 years for Ph.D. students. Below is a graph depicting graduation rates over a 5-year period. Good job – faculty and students!

7 Faculty News

9 Graduate Updates

10 Postdocs and Undergrads



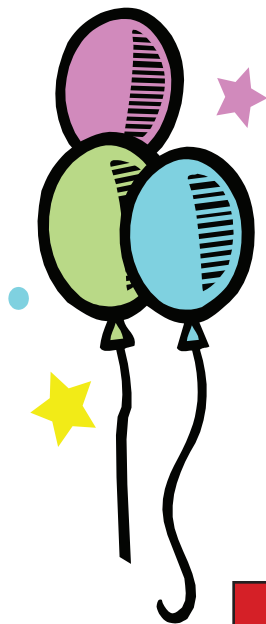
Thanks to all the faculty and students who helped to make this year another success for the ITP.

All the Best,

Dr. Jeff Fisher



Fall Social



The ITP kicked off the Fall 2007 semester with a social at Flinchum's Phoenix, a cabin generously loaned to the ITP by the Warnell School of Forestry and Natural Resources. This event was a great way to start the semester - it brought together the various departments of the ITP and allowed new faculty and students to meet existing faculty.

The social was held in September on a warm Friday afternoon. Food and drinks were provided, and everyone enjoyed sitting out on the deck overlooking the forest. A good time was had by all!



Elizabeth Irvin, Denita Williams, and Tantiana Burns enjoying the fall social!

TOXICOLOGY SEMINARS

The ITP sponsored three interesting seminars this year, with speakers from across the United States representing a variety of organizations. Seminars were well-attended and followed by catered receptions. During the receptions, students and faculty took advantage of the opportunity to chat with the presenters in a more casual setting.

/// Dr. Harvey Clewell, III, Director of the Center for Human Health Assessment at the Hamner Institute for Health Sciences in Research Triangle Park, NC : "Application of Monte Carlo Techniques for the calibration of PBPK models and their application to reverse dosimetry of human biomonitoring data: examples with carbaryl and trichlorethylene." July 27, 2007

/// Dr. Francesco Marchetti, Lawrence Berkeley National Laboratory, Berkeley, CA: "Molecular mechanisms and environmental factors affecting paternally-transmitted chromosomal damage." March 26, 2008

/// Dr. R. Thomas Zoeller, Professor, University of Massachusetts, Amherst, MA: "Thyroid toxicology - Do we need to think differently?" November 15, 2007.



Dr. Marchetti

Stay up-to-date on Tox and UGA sponsored events at:
www.uga.edu/mastercalendar



Dr. Zoeller and Dr. Fisher

Every year, the ITP hosts a spring retreat to showcase the program and give students the opportunity to present their research. The retreat also gives students and faculty a chance to relax and mingle. This year's keynote speaker was Dr. Paul E. Newton, Ph.D., D.A.B.T. from MPI Research in Mattawan, MI. Dr. Newton discussed pharmaceutical development and the differences between the FDA and ICH processes. After the keynote address came the student platform presentations:

/// Tantiana Burns, Department of Pharmaceutical & Biomedical Sciences: "Evidence for Fumonisin-Corn Matrix Binding During Nixtamalization". Advisor Ken Voss (Best Platform Award)

/// Elizabeth Irvin, Department of Environmental Health Science: "Maternal and placental effects of infection with *Listeria monocytogenes* in pregnant guinea pigs". Advisor: Mary Alice Smith

/// Curtis Harris, Department of Pharmaceutical & Biomedical Sciences: "Relative Kinetics of Potassium Iodide and Perchlorate as Antidotes to Radioiodide Exposure". Advisor: Cham Dallas

POSTER PRESENTATIONS

CORY GRESHAM: INTRODUCTION OF A NEW MODEL FOR FEMALE GERM CELL MEDIATED MUTAGENESIS USING A TRANSGENIC MEDAKA

HONGBO MA: BIOAVAILABILITY AND TOXICITY OF NANOSIZED ZNO PARTICLES AS COMPARED TO AQUEOUS ZNCL₂ IN THE NEMATODE CAENORHABDITIS ELEGANS

SHEP MARTIN: INHALATION KINETICS OF JET FUEL COMPONENTS IN THE RAT

MICHELLE NORRIS: EVALUATION OF SPERMATOZOA AS A PREDICTOR OF GERMLINE MUTATIONS USING A TRANSGENIC MEDAKA
2ND PLACE

ARENA RICHARDSON: INFECTIVITY, BIOMARKER LEVELS, AND COMPARISON OF VIRULENCE OF ENTEROBACTER SAKAZAKII IN CD-1 NEONATAL MICE

GIDEON ST.HELEN: ASSESSMENT OF SECONDHAND SMOKE EXPOSURE OUTSIDE OF RESTAURANTS AND BARS IN ATHENS, GEORGIA USING SALIVARY COTININE AND URINARY NNAL

SPRING TOXICOLOGY RETREAT



Jeff Fisher with this year's platform and poster winners: Tantiana Burns, Xiaoling Zhang, Michelle Morris, and Aaron Wilson.

/// David Rouse, Department of Entomology: "Effects of landuse on water quality and macroinvertebrate communities in the southern inner piedmont ecoregion of Georgia". Advisor: Jay Overmyer

After a poster viewing session, everyone gathered for a group photo (featured on the cover) and then it was off to lunch! During lunch, awards were presented for best presentations and posters.

BIN SUN: INHIBITION OF CA²⁺ INDEPENDENT PHOSPHOLIPASE A2 INDUCES P53 DEPENDENT PROSTATE CANCER CELL DEATH

DENITA WILLIAMS: MATERNAL AND FETAL RESPONSES TO ORAL CHALLENGE WITH *LISTERIA MONOCYTOGENES* AND AN ANTI-INTERNALIN PEPTIDE IN PREGNANT GUINEA PIGS

AARON WILSON: THE BIOACCUMULATION OF TRACE ELEMENTS BY *CORBICULA FLUMINEA* AND *ELLIPTIO HOPETONENSIS* IN THE ALTAMAHA RIVER SYSTEM
3RD PLACE

XIAOLING ZHANG: ROLE OF CALCIUM-INDEPENDENT PHOSPHOLIPASE A2 IN SIGNAL TRANSDUCTION DURING CYTOSTASIS AND CELL DEATH IN PROSTATE CANCER CELLS
1ST PLACE

UNDERGRADUATE:

CHRISTINE KENDRICK: EVALUATION OF POTENTIAL INHALATION HAZARDS OF PETROLEUM-, SYNTHETIC- AND BIO-FUELS USING GC/MS ANALYSIS OF VAPORS UNDER EQUILIBRIUM CONDITIONS

POST-DOC:

RAPHAEL TREMBLAY: A NOVEL METHOD FOR THE CHEMICAL CHARACTERIZATION OF GENERATED JET FUEL VAPOR AND AEROSOL FOR ANIMAL STUDIES

Support the Interdisciplinary Toxicology Program

We would like to take this opportunity to invite you to make a tax deductible financial contribution to the UGA Toxicology Program. You can make a secure credit card contribution online (www.toxicology.rx.uga.edu/contact.asp). When doing so, please type Toxicology Program in the form where it says, "Specify other/multiple gift areas." Doing so will ensure that your gift is directed to the Toxicology Program.

The Interdisciplinary Program in Toxicology Fund is a University of Georgia Foundation discretionary account supporting the activities of the Interdisciplinary Toxicology Program. It enables the Program to host internationally recognized speakers, hold conferences and workshops and provide support for graduate students to attend national meetings to present scientific results.

If you prefer to make a donation the old-fashioned way, please fill out our form on the reverse side, print it and mail it to:

Interdisciplinary Toxicology Program
The University of Georgia
N124 Paul D. Coverdell Center
Athens, GA 30602-7396



Name: _____

Address: _____

Phone: _____

Email: _____

I would like to contribute to the University of Georgia Foundation. My gift will be designated for the Interdisciplinary Program in Toxicology Fund.

The Interdisciplinary Program in Toxicology Fund is a University of Georgia Foundation discretionary account supporting the activities of the Interdisciplinary Toxicology Program. It enables the Program to host internationally recognized speakers, hold conferences and workshops and provide support for graduate students to attend national meetings to present scientific results.

Funds of this type are essential to the expansion and success of this campus-wide interdisciplinary training program.

Enclosed is my gift for \$ _____

Signature: _____

Please send this form with your check, made payable to the University of Georgia Foundation, to the Interdisciplinary Toxicology Program, N124 Paul D. Coverdell Center, Athens, GA 30602.

You may also make a secure credit card donation via our website at

<http://www.toxicology.uga.edu>.

Thank you for your support of the program!

PROFESSIONAL SOCIETIES

Society of Environmental Toxicology and Chemistry



The 29th annual meeting of the Society of Environmental Toxicology and Chemistry took place in Milwaukee, WI November 11-15, 2007 with a number ITP students and faculty in attendance. According to Aaron Wilson, a PhD student studying endangered mussels, the meeting “was like a big party...but with all your favorite environmental toxicologists!”

With over 2,500 environmental science professionals from around the world, the meeting was an excellent opportunity to both network and reconnect with colleagues.

Society of Toxicology

A group of students and faculty from the ITP attended the 47th annual meeting of the Society of Toxicology (SOT) in Seattle, WA from March 16-20. The ITP funded partial travel for many of the graduate students. The SOT is one of the premier professional societies for toxicologists and the meetings are the perfect opportunity to network and be exposed to the latest toxicological research. This year's meeting was a huge success with over 2,300 posters and platform sessions as well as a number of workshops. The annual meeting was also host to ToxExpo, an exhibit showcasing the latest, cutting-edge products and services. According to Bin Sun and Xiaoling Zhang, ITP PhD students in the College of Pharmacy, “We really enjoyed our first experience of SOT annual meeting. It's amazing - it is an international meeting and the attendants are from all over the world such as Britain, Japan, Korea, etc. There are lots of academic workshops, seminars and symposiums covering all the differential areas of Toxicology.”



Another highlight of the trip was visiting Seattle (for those attendees who were able to break away from the conference). The famous Seattle fish market and the Space Needle were just a few of the fun side trips enjoyed by ITP students and faculty!

Special thanks to Christine Kendrick, Xiaoling Zhang, Susie Ritger, Mary-Alice Smith, Jim Bruckner (pictured at left), and Jeff Fisher for representing the ITP during the recruitment session.

FACULTY NEWS

Welcome!

The ITP welcomes several new faculty, while current faculty have been hard at work continuing advancement in the field of toxicology!



The ITP would like to welcome **Robert Bringolf** to the program and UGA. Dr. Bringolf joined ITP and the Warnell School of Forestry and Natural Resources in the Fall of 2007. Prior to coming to UGA, he was a research associate in the Department of Environmental and Molecular Toxicology at North Carolina State University where he developed standard toxicity testing for freshwater mussels. He has also conducted research with endocrine disruptors and aquatic systems. At UGA, he plans on continuing his research on endocrine disruptors while also studying the effects of contaminants on interactions between mussels and fish. He is looking forward to teaching both Ecotoxicology and Fish Physiology this Fall.

Fisheries and Aquaculture
Warnell School of Forestry and Natural Resources

Travis Glenn recently relocated to the Environmental Health Science department from the Savannah River Ecology Lab (SREL). Although he has been a member of the faculty of UGA for 10 years, he spent most of his time at SREL. Now that he's on campus, he will be working at the Laboratory of Genomics and Bioinformatics where he hopes to develop collaborative research. Dr. Glenn's research interests include the use of DNA to understand the effects of environmental contaminants. He has conducted a great deal of research on the isolation of microsatellite loci as molecular markers from a variety of organisms. According to Dr. Glenn, "Any organism with DNA is fair game!" He has worked with organisms from all kingdoms, but is especially fond of crocodilians. But...working with alligators and crocodiles requires catching them, and catching alligators must be done in the early morning hours. Their record catch was 10 meters (or almost 33 feet) of alligators in a single night!



Environmental Health Science
College of Public Health

Xiaoqin Ye joined the ITP in Fall of 2007. She comes to UGA from from the Scripps Research Institute in La Jolla, CA where she was a senior research assistant. Dr. Ye received an MD from Peking University in Beijing, China, an MPH from the Chinese Academy of Preventative Medicine and a PhD in Environmental Toxicology from the University of California, Riverside. Her research interests include lysophospholipid signaling in implantation and spermatogenesis and reproductive toxicology.



Physiology and Pharmacology
College of Veterinary Medicine



Jason Zastre is another new faculty member. Dr. Zastre came to UGA from the University of Toronto where he was a postdoctoral fellow. He received an MS in Pharmacy from the University of Manitoba and his PhD from the University of British Columbia. Dr. Zastre is currently researching drug transport in the use of multiple medications for treatment of HIV/AIDS, cancer and cardiovascular disease.

Pharmaceutical and Biomedical Sciences
College of Pharmacy



International Collaborations!
Richard Winn

an ITP faculty member, conducts research at the Aquatic Biotechnology and Environmental Laboratory (ABEL). ABEL is a state of the art research facility constructed in 2006 which has become one of the top aquatic animal resource centers in the world. His research is focused on the use of transgenic fish as non-mammalian animal models for human diseases, including cancer.

Dr. Winn has been invited to several conferences in Japan to exchange information on the latest research findings and to enhance greater collaborations. He also recently completed studies with French investigators, including hosting a Post-Doctoral fellow and graduate student, on the impacts of chemical contaminants in the major river, the Seine River. Dr. Winn's team demonstrated that the variety of chemical pollutants found in the sediments caused significant increases of mutations, cancer and other health problems for fish. He is currently working with Australian researchers exploring the mechanisms of ultraviolet radiation (UV) and cancer. Dr. Winn has also been invited to China to discuss his findings on environmental contaminants and potential for adverse genetic effects – hopefully, this will lead to a collaborative research program and the opportunity for student exchanges!

Fisheries and Aquaculture
Warnell School of Forestry and Natural Resources

GRADUATE UPDATES

Brianna Peterson

Eva McLanahan



Dr. Peterson at the scene of the crime!

Dr. Peterson is working for the Washington State Patrol in Seattle, WA, where she is a forensic toxicologist. This includes conducting laboratory testing for all police agencies, medical examiners, and coroners in the state. She analyzes samples (blood, urine, tissues etc.) for the presence of drugs and alcohol and provides court testimony. She is also on the crime scene response team – this unit is called out to crime scenes to document, collect evidence and provide a reconstruction report. Pretty exciting job!

Dr. McLanahan began a postdoctoral position as a Toxicologist with EPA's National Center for Environmental Assessment, Hazardous Pollutants Assessment Group in Research Triangle Park, North Carolina in January 2008. She was immediately selected for a special research and evaluation group on perchlorate because of her work at UGA. She is also part of the EPA's Pharmacokinetic Working Group that evaluates physiologically based pharmacokinetic and other quantitative biological models for use in risk assessments. Dr. McLanahan attended the SOT conference in March and received the Perry J. Gehring Biological Modeling Award for her biologically-based dose response model of the HPT axis and iodide deficiency and perchlorate perturbations in rats. Congratulations Eva!

Congratulations Graduates

The ITP would like to congratulate the following students who graduated this past year:

Spring 2008

Elizabeth Irvin, PhD

Advisor: Mary Alice Smith

Immunological and pathological changes after maternal exposure with *Listeria monocytogenes* in pregnant guinea pigs.

Fall 2007

Eva McLanahan, PhD

Advisor: Jeff Fisher

Dose-Response Analysis of Hypothalamic-Pituitary-Thyroid (HPT) Axis Perturbations in the Adult Rat using Statistical Methods for the Binary Mixture of PCB126 and Perchlorate and Computational Modeling for Iodide Deficiency and Perchlorate.

Summer 2007

Paul Melstrom, PhD

Advisor: Phil Williams

The nematode, *Caenorhabditis elegans*, as a model for mammalian cholinergic neurotoxicity.

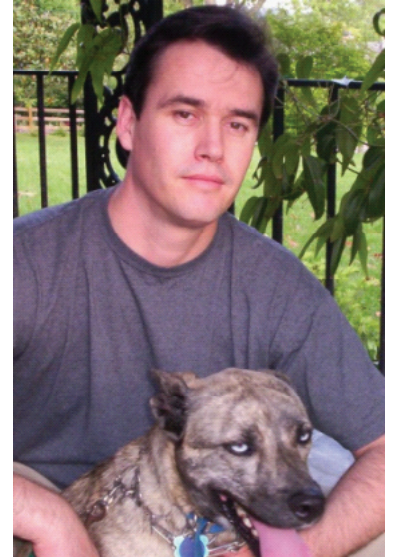


ITP POST DOCS....



Former EHS Post Doc Makes Scientific Splash with Nanotoxicity Research Findings!

Dr. Ted Henry conducted postdoctoral research in Dr. Marsha Black's lab in Environmental Health Science from 2002-2004. During his time at UGA he researched the effects of pharmaceuticals on aquatic organisms. He accepted a position with the University of Tennessee in 2005, and in 2007 he moved to England where he is now an Academic Fellow at the Ecotoxicology and Stress Biology Research Centre at the University of Plymouth. He has conducted groundbreaking research in the emerging field of ecotoxicology of nanomaterials. Nanomaterials are of great interest since their use in society is increasing dramatically. However, the environmental and health effects of nanomaterials are just now being evaluated in a systemic fashion. One recent alarming publication in the journal, Environmental Health Perspectives, reported that C60, a nanoparticle, caused oxidative damage in brains of fish. The results of this well cited paper were challenged by the research of Dr. Henry and his colleagues. They unequivocally demonstrated that the vehicle used to dissolve the water insoluble nanoparticle into the water housing the fish was the cause for the brain toxicity. He and his team published their findings in 2007 in the same journal. Congratulations and keep up the exemplary research!

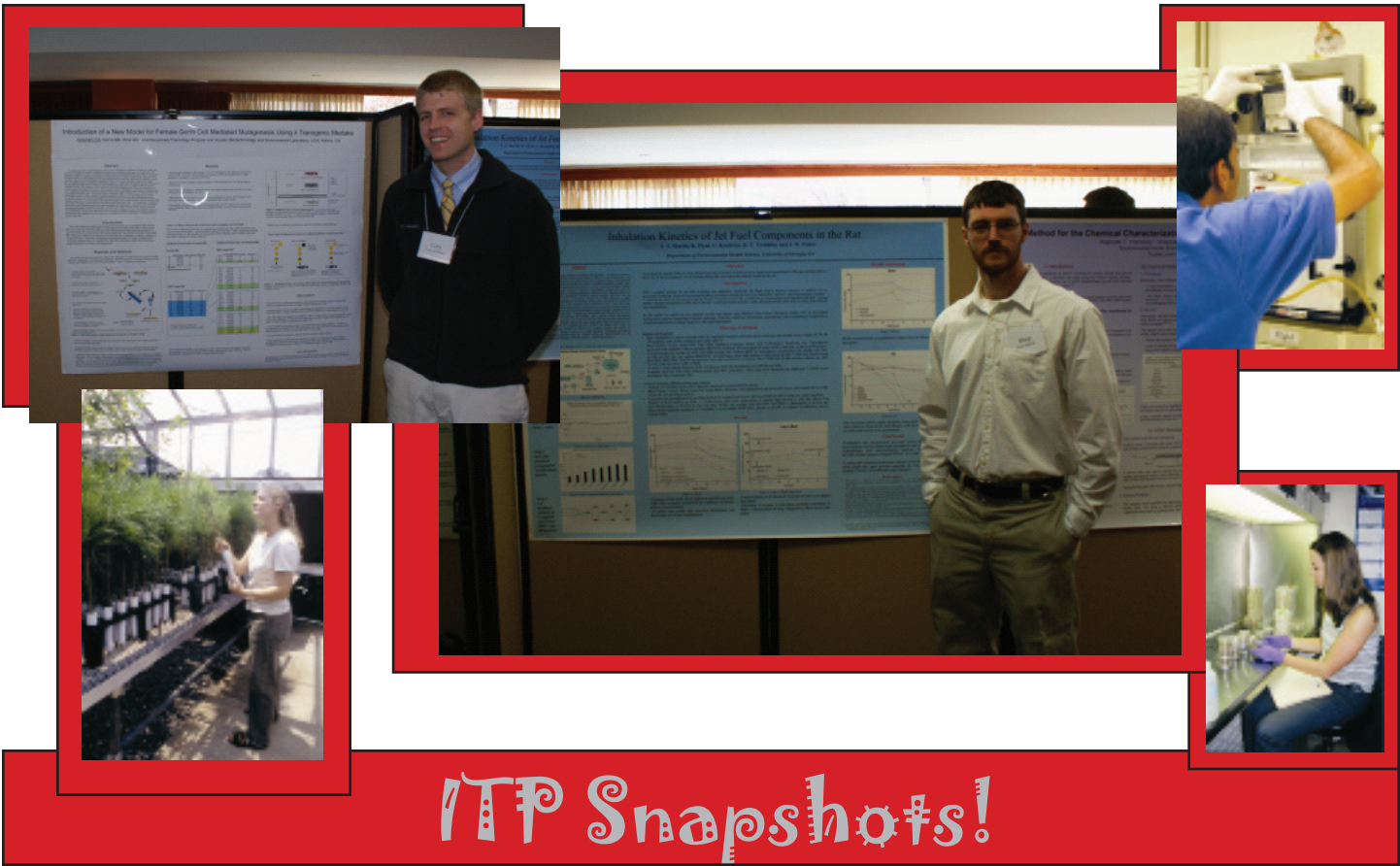


AND UNDERGRADS!



Prashant Monian is an undergraduate conducting research in Dr. Brian Cummings lab. He was supported by the ITP through CURO (the Center for Undergraduate Research Opportunity). The ITP works with CURO in order to encourage students to go on to graduate school and study toxicology. His research interests include the effects of bromate, a possible carcinogen, on the phospholipid profile of rat kidney cells. He presented his research investigating the effects of cocaine withdrawal on rat brains at the CURO symposium March 31, 2008 at the Georgia Center.





ITP Snapshots!



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