



Molecular and  
Systems  
Biology  
Specialty  
Section

## News from the Molecular & Systems Biology Specialty Section

### President's Message



The pace of change underway in toxicology and risk assessment is difficult to fathom. Advances in molecular and cellular biology that have been standard tools for basic research for over a decade are rapidly being adopted to eventually replace many conventional animal tests that are used to provide evidence for the safe use of drugs, crop protection products, industrial chemicals and consumer product ingredients. Some of the drivers for these changes include the need to predict potential toxicity in early R&D stages of drug and chemical development, rapidly fill data gaps for many chemicals in commerce, prioritize chemicals for further testing, and provide evidence of safety for registration of cosmetic ingredients that have bans

on animal testing in some jurisdictions. Moreover, societal pressures are to provide this at a faster pace while using fewer animals.

Last year at the annual meeting reception, our past president Dr. Nancy Denslow announced that our specialty section has changed its name from the Molecular Biology Specialty Section to the Molecular and Systems Biology Specialty Section. While this might not seem to be a big change, the intent was to ensure that our specialty section's name accurately reflects both the science that is of interest and important to our members as well as the science that our members actively engage in their research, testing and regulatory decision making. Toxicology is a systems biology discipline and this is becoming increasingly important in all sectors where toxicology is practiced. Thus, the MSBSS is uniquely positioned as the place where molecular and systems biology experts in our scientific society gather to discuss this science and ensure that the best and most relevant molecular and systems biology science is presented at the SOT annual meeting and other regional meetings.

As this year's president I have the privilege of serving our specialty section and carrying out the many responsibilities that ensure our specialty section's record of success. But this year I have the additional special privilege of announcing the winner of the new MSBSS logo competition. There were 12 logo designs submitted that were as creative and diverse as our membership. Sadly however, only one could be chosen and this is proudly placed at the top of this newsletter. A hearty congratulation goes out to Dr. Cassandra Deering Rice, University of Utah, Department of Pharmacology and Toxicology who designed this logo that will now reside on all of the MSBSS official documents and on our Website. Thanks to all of you who submitted ideas and to those of you who took the time to consider these designs and cast your vote.

A reminder to please submit your applications for an MSBSS award. There are competitive awards for the best abstract from post-docs and grad students. In addition, this is the second year MSBSS will give an award for Paper of the Year. So there are lots of opportunities to be recognized by your peers, but you must apply for this to happen! More details follow below.

Finally, let me just say that this is an exciting and opportune time to be a toxicologist. You might hear the term paradigm shift bantered about often, but in this case it is very true. This is the time to get engaged, the Molecular and Systems Biology Specialty Section is well placed to help toxicology move into the next generation. We look forward to seeing all of you at the MSBSS reception at the Annual Conference, which will be held Monday, March 23, 2015 from 6-7:30 pm. Check the meeting program for the room location.

#### Officers

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## ***Treasurer's Report***

### **MBSS Financials (June 1, 2013 to June 30, 2014)**

	<b>Dollar Amount</b>
<b>Net Assets at Beginning of the year</b>	<b>\$ 34,066</b>
Registration	\$1,559
Membership Dues	\$2,415
Interest	\$1,693
<b>Total Income</b>	<b>\$5,667</b>
Expenses (Awards)	\$850
Expenses (Plaques)	\$240
Expenses (Reception)	\$3,090
<b>Total Expenses</b>	<b>\$4,180</b>
<b>Revenue over expense</b>	<b>\$1,487</b>
<b>NET Assets End of Year</b>	<b>\$35,553</b>

### **Endowment Fund**

	<b>Dollar Amount</b>
<b>Net Assets Beginning of Year</b>	<b>\$ 34,392</b>
Contributions	\$400
Return on investments	\$1,118
Gain	\$3,911
<b>TOTAL RETURN</b>	<b>\$5,029</b>
Expenses (Awards)	\$1,200
<b>Total Expense</b>	<b>\$1,200</b>
Revenue over expenses	\$4,229
<b>Net Assets End of the Year</b>	<b>\$38,621</b>

## ***MSBSS Endowment Matching Contribution Program***

Taking advantage of SOT's endowment match, MSBSS has launched an endowment drive where the Specialty Section will match a member's endowment contribution at a 3:1 rate. In addition, SOT will match the member's original contribution.

Please consider donating to the MSBSS endowment so we can take advantage of the great opportunity to ensure the MSBSS is financially secure into the future and can continue to offer graduate student, post-doc and best paper awards.

## ***Dues Reminder***

The annual Society of Toxicology membership deadline for dues is December 15th. Please remember to renew your membership to the Society of Toxicology and to the MBSS. Also, please encourage your graduate students, post-doctoral fellows, and colleagues to become members of MBSS. This is a good time to also think about donating to the endowment fund to help support our student and postdoctoral prizes.

## ***2014 Annual Meeting Sessions Sponsored By MBSS***

The MSBSS was the primary sponsor of five symposia and four workshops at the 2014 Annual Meeting, as well as a secondary or tertiary sponsor of several additional symposia, workshops and continuing education courses. We wish to thank the chairs, co-chairs and speakers in these sessions.

### **Sponsored Symposia**

1. Molecular Mechanisms Involved in Neuro/Glial Toxicity: From Oxidative Stress to Redox Signal Transduction
2. Does this Chemical Make My Liver Look Fat? (Environmental Exposures and Steatosis)
3. Does Evolution Matter in Toxicity Testing in the 21st Century? Rethinking Cross-Species Extrapolation in Hazard Characterization
4. The Role of the AHR in Stem Cell Development and Lineage Specification
5. Adverse Outcome Pathways as an Integrative Framework for Predictive Toxicology:

### **Sponsored Workshops:**

1. Developmental Programming of Hepatic Metabolism: Assessing the Impact of Perinatal Exposure to Xenobiotics
2. Adverse Outcome Pathways: A Conceptual Framework for 21st Century Risk Assessment
3. Databases Facilitating Systems Biology Approaches to Toxicology
4. Toxicogenomic Technologies Can Improve the Assessment of Xenobiotic-Induced Liver Injury and Inform Human Relevance

## ***Molecular Biology Specialty Section Paper of the Year Award***



Congratulations to the first annual MSBSS Paper of the Year Award. Last year's MBSS Paper of the Year Award went to Dr. Alison Harrill and colleagues. The paper, published in *Toxicological Sciences* in 2012 (130: 416-426), was titled "A Mouse Diversity Panel Approach Reveals the Potential for Clinical Kidney Injury Due to DB289 Not Predicted by Classical Rodent Models."

A significant number of drugs produce unexpected toxicological effects due to genetic diversity present in the human population, yet this diversity is often underrepresented in classical safety testing strategies. Dr. Harrill and colleagues were able to detect human-relevant safety liabilities in mice for a drug that caused serious kidney injury in a clinical trial that was not predicted by preclinical testing. To accomplish this task, the team exposed a genetically diverse population of mice to the drug, DB289, and measured a sensitive renal injury biomarker, kidney injury molecule-1 (KIM-1), in the urine. This paper outlines an exciting advance in toxicological testing that takes into account gene-environment interactions and promises increased protection of human health.

## *Nominations Sought for MSBSS Paper of the Year*

The Molecular & Systems Biology Specialty Section (MSBSS) will give a monetary award at the SOT Annual Meeting for an outstanding paper applying molecular biology techniques to toxicity evaluation. Papers will be judged on the basis of innovation, quality of the study, quality of the manuscript, and application of molecular biology techniques to understanding mechanisms of toxicity and/or use in risk assessment. Papers can be self nominated or nominated by other MBSS members. Deadline is midnight on November 1, 2014. The paper must be published in a peer-reviewed journal during the 12 month period (August 1 to July 31) prior to the SOT meeting year. The award will be presented at the Annual Meeting, the following year. The nominee is expected to be the first author of the publication and a member of the MBSS. Review articles are not eligible. Submission materials must include a PDF of the paper and a short discussion (no more than one page) of the impact of the paper on the field including originality, quality, and impact. Please email the submission materials to Alison Harrill [AHHarrill@uams.edu](mailto:AHHarrill@uams.edu)

## *2014 Graduate Student and Postdoctoral Fellow Awards*

The highlight of the MSBSS reception at the annual meeting is the recognition of the graduate student and post-doctoral fellow award winners. The awards are extremely competitive and are an excellent way to enhance career development and become involved in the society. The awards were covered by our Molecular & Systems Biology Student Award Fund.

### **2014 Graduate Student Award Winners**

- **1<sup>st</sup> Place:** Tejas Lahoti - Activation of aryl hydrocarbon receptor (AHR) synergistically induces lipopolysaccharide (LPS)-mediated transcription of pro-inflammatory chemokine (C-C motif) ligand 20 (Ccl20)
- **2<sup>nd</sup> Place:** Xi Li – Diindolylmethane (DIM) Analogs as a New Class of NR4A1 Antagonists
- **3<sup>rd</sup> Place:** Mary Popovech - Acute and subchronic, in vivo, exposure to inhaled silver-nanoparticles results in alterations in gene expression, gene-specific promoter methylation, and inner and outer mitochondrial membrane integrity.



Xi Li , Tejas Lahoti & Mary Popovech



Jill Franzosa, Shaun McCullough & Tongde Wu

### **2014 Post-Doctoral Award Winners**

- **1<sup>st</sup> Place:** Shaun McCullough – Ozone Induces Lung Epithelial Cell Inflammation through MAP Kinase Activation without NF- $\kappa$ B Activation
- **2<sup>nd</sup> Place:** Jill Franzosa - RNA-Seq analysis of the functional-link between vascular disruption and adverse developmental consequences
- **3<sup>rd</sup> Place:** Tongde Wu - p97 modulates NRF2-Keap1-mediated antioxidant response

If you are interested in applying for this award this year, please send materials to Joel Meyer ([joel.meyer@duke.edu](mailto:joel.meyer@duke.edu)). More information is available at <http://www.toxicology.org/isot/ss/molecular/>

## *For MBSS Graduate Students and Postdoctoral Members*

### **2015 Annual Meeting: Events for Graduate & Postdoctoral Trainees**

Brief summaries of the exciting scientific, networking, and social opportunities scheduled for the 2015 meeting in San Diego are listed below. Some of the events do require a ticket. For more details, please see: <http://www.toxicology.org/AI/MEET/AM2015/studevent.asp>

### **Student/Postdoctoral Scholar Mixer (Ticket Required): Sunday, March 22, 7:30 - 9:00 PM**

The Graduate Student Leadership Committee (GSLC) hosts this fun and informal event for students and postdoctoral scholars to gather, meet new colleagues, and re-establish relationships. Complimentary refreshments and a cash bar will be available.

### **Trainee Discussion with Plenary Lecturer Dr. J. Craig Venter (Ticket Required): Monday, March 23, 10 –11:00 AM**

Dr. Venter (J. Craig Venter Institute, San Diego, CA) will meet informally for a discussion with trainees following his Plenary Opening Lecture.

### **In Vitro Toxicology Lecture and Luncheon for Students (Ticket Required): Monday, March 23, 12–1:20 PM**

The Education Committee holds this In Vitro Toxicology Lecture series to feature important research using in vitro and alternative techniques to study basic mechanisms and illustrate how these methods benefit animal welfare by refining, reducing, and replacing animal use whenever feasible. Undergraduate students, graduate students and postdoctoral scholars are all invited to attend.

### **Postdoctoral Assembly (PDA) Luncheon (Ticket Required): Tuesday, March 24, 12 – 1:15PM**

The PDA hosts a casual luncheon for postdoctoral scholars to socialize, relax and celebrate achievements of their peers. The postdoc award recipients from SOT Regional Chapters, Special Interest Groups, and Specialty Sections, along with the Best Publication Awards will be recognized. In addition to a provided lunch, door prizes are always a highlight of the event!

### **Tox ShowDown: Tuesday, March 24, 7:30 – 9:00 PM**

The GSLC-sponsored Tox ShowDown is a fun and engaging quiz game patterned off the show It's Academic. Door prizes are raffled off and the winning team receives prizes ranging from restaurant gift cards to toxicology books. If you are interested in becoming a contestant on one of the teams, email the GSLC Secretary or SOT Headquarters.

### **Trainee Discussion with Medical Research Council (MRC) Lecturer, Dr. Brigitta Stockinger (Ticket Required): Wednesday, March 25, 9:30 – 10:30 AM**

Dr. Stockinger (MRC National Institute for Medical Research, London, United Kingdom) will meet for an informal discussion with graduate students and postdoctoral scholars after her Keynote MRC Lecture.

### **Undergraduate Student Meeting: Wednesday, March 25, 4:00-5:00 PM**

All undergraduate students attendees are encouraged to participate in an informal meeting to talk about shared interests related to career paths in toxicology, discuss undergraduate tox-related activities, clubs, and majors on their campuses, and to provide feedback to the Undergraduate Education Subcommittee.



**Chat with an Expert: Monday, March 23 - Thursday, March 26, Time Varies by Group**

This event provides trainees the opportunity to network informally with well-established toxicologists while obtaining career advice and meeting new colleagues. Trainees are matched with experts by research interests and expertise. Refer to the Chat with an Expert web page for more information and registration forms

(<https://www.toxicology.org/ai/spd/chatexpert.asp>).

**Poster Tours for Trainees: Monday, March 23 - Wednesday, March 25, Time Varies by Group**

The PDA organizes 1 hour tours for trainees to accompany expert toxicologists to participate in critical evaluations of cutting-edge toxicology methods and research findings in areas of scientific interest.

**Awards and Fellowships**

In addition to the awards offered by MSBSS, SOT provides numerous opportunities to recognize outstanding student and postdoctoral trainees and assist with travel to the annual meeting. Please visit <http://www.toxicology.org/AI/AF/awards.aspx> for further instructions and eligibility.

**2014 Annual Meeting: Highlights from Trainee Events**

In addition to the PDA luncheon, this year's annual meeting offered a variety of other events for postdoctoral members. The GSLC hosted Chat with an Expert that afforded trainees the opportunity to informally network with well-established toxicologists, obtain career advice, and meet new colleagues. The PDA arranged the opportunity to participate in guided Poster Tours by expert toxicologists. The well-attended, annual Student/Postdoc mixer provided an ideal venue to socialize and network with fellow trainees. Additionally, an Informational Session titled Leadership in Science: Skills and Styles was co-sponsored by PDA, CRAD, and WIT. The In Vitro Toxicology Lecture and Luncheon with Helena Kandarova (MatTek Corp. & MatTek In Vitro Life Science Laboratories) hosted for students and postdocs featured a discussion on in vitro techniques and alternatives to animal studies. Another highlight of the 2014 meeting were two sold-out trainee discussion events with the Plenary Lecturer, Dr. Gurdon (Hosted by PDA Chair Dr. Ebany Martinez-Finley) and Medical Research Council Lecturer, Dr. Scott. In all, the Phoenix meeting had numerous, successful training and networking events for postdoctoral students. Please consider taking advantage of these (listed above) at the 2015 meeting in San Diego, CA.

**Professional Development Webinars**

The PDA and GSLC offer several webinars throughout the year on professional development for trainees. Please be on the lookout for emails about these great webinars.

**FREE Online Continuing Education Courses Available to Trainees**

SOT recently expanded the list of online Continuing Education (CE) courses by adding nine from the 2014 Annual Meeting in Phoenix. If you were interested in a 2014 CE course, but were unable to attend, you can access recorded versions of these talks at no charge for postdocs and graduate students. A total of 41 CE courses presented at Annual Meetings from 2009 to 2014 are available. In addition, PDF course books for the 2014 online CE courses are available. Please take advantage of this opportunity!

## ***2015 Annual Meeting Sessions Endorsed by MSBSS***

Two continuing education, three symposia and eight workshops having MSBSS endorsement have been tentatively accepted for the 2015 SOT Annual meeting. Keep an eye out for these sessions and remember the titles may change a bit with their final acceptance by the SOT program committee.

### **Endorsed Symposia**

1. The Role of Connexin-Based Channels in Toxicity
2. Chromatin Structure, Genomics, and Transcriptional Responses to Environmental Insults
3. Role of the Gut Microbiome in the Host Response to Xenobiotics

### **Endorsed Continuing Education Courses**

1. Strategies in Investigative Toxicology in a Pharmaceutical Setting
2. Toxicogenomics Meets Regulatory Decision-making: How to Get Past Heat Maps, Network/Pathway Diagrams, and "Favorite" Genes

### **Endorsed Workshops**

1. Windfall or Pitfall: Is There a Need for Modification of Developmental and Reproductive Toxicology Studies When Endocrine Disruption Is the Mode of Action?
2. Considering Pharmacokinetics As the Mechanistic Basis to Link Chemical Exposures to Adverse Outcome Pathways
3. Painting the Future of Repeat-Dose Systemic Toxicity Testing: Progress from the European SEURAT-1 Project
4. The US Tox21 Collaboration: Advances Made and Lessons Learned
5. Toxicological Epigenomics: The Interface between the Environment and Human Health
6. Transporters As Gatekeepers for Chemical Exposure in Reproductive Tissues
7. Genomics of Nonrodent Mammalian Species and Impacts on Nonclinical Safety Evaluation of Pharmaceuticals and Clinical Translation
8. Integrating Gene Expression Profiling into High-Throughput Toxicity Testing

## ***MSBSS Needs You... To Serve as an Officer or Representative!***

The MSBSS election is held prior to the Annual Meeting. This year we will need to elect a new Vice President elect (total of 4 year commitment, VP-elect, VP, President, Past President), a Junior Councilor (2 year commitment), a Junior Student Representative (2 year commitment), and a Postdoctoral Representative (1 year commitment). If you are interested in running for an officer position or would like to nominate someone please contact Kristie Willett ([kwillett@olemiss.edu](mailto:kwillett@olemiss.edu)) who will be coordinating the election this year.

Anyone interested in running for office will need to submit a brief bio by December 15, 2014. MSBSS now elects student and post-doctoral representatives through the annual ballot. This is a great opportunity for students and post-doctoral fellows. One of the Junior Student Representatives serves a one-year term on the SOT Graduate Student Leadership Council (GSLC). The GSLC-representative is able to run for office within the GSLC and serve on its executive board as the role of GSLC within SOT continues to be refined. If you wish to be considered for the MBSS graduate student representative, you must be a full-time graduate student in good standing and have interest in SOT policy and initiatives. The Postdoctoral Representative position is for one year and you must be a post-doctoral fellow from May 2014-May 2015.

Feel free to contact any of the MBSS officers with questions or visit the following website for details on officer responsibilities:

**<http://www.toxicology.org/ISOT/SS/molecular/MBSS.html>**

## ***A Plea from the Vice President Elect...***

Although 2015 may seem like a long way off, the Society of Toxicology requires session proposals to be submitted shortly after the 2014 meeting. It is not too early to start thinking about innovative sessions that may contribute to the 2014 meeting. Please be aware that the MSBSS officers are there to provide suggestions and assist you with the development and sponsorship of the proposals. We especially want to remind you that coordinating your submission early with the VP elect (Bhagavatula Moorthy [bmoorthy@bcm.tmc.edu](mailto:bmoorthy@bcm.tmc.edu)) will allow us to provide feedback on the proposal prior to submission. This practice has proven invaluable over the past few years in terms of success rates for acceptance by the Program Committee. The MSBSS leadership notes that in previous years sessions co-chaired by junior faculty members were selected demonstrating that a winning symposium/workshop/CE course does not depend on the seniority of the co-chairs. Students and Post-Docs are also strongly encouraged to communicate with the MSBSS officers to develop any ideas they may have.

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If you need more information on our specialty section, please check out our web site:

<http://www.toxicology.org/ISOT/SS/molecular/MSBSS.html>

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