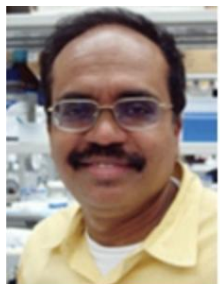




Molecular and  
Systems  
Biology  
Specialty  
Section

## News from the Molecular & Systems Biology Specialty Section

### President's Message



#### Hello MSBSS Members

Molecular and Systems Biology entail novel mechanistic approaches, in conjunction with large data sets to infer system wide changes. In medicine, over the past 30 years, the magnitude of the contribution of our genes to our well-being has begun to be appreciated. There has been a fusion of bottom-up genetic approaches with top-down physiological approaches to solve complex fundamental questions; this is the essence of Systems Biology! Research in Molecular and Systems Biology contributes immensely to our understanding, diagnosing and treatment of disease in the 21st century, comparable to the contributions from physiology and biochemistry in the 20th century. Research in molecular systems biology will also make major contributions to methodologies and problem solving in Toxicology.

This newsletter provides an update on all the activities of our section the past six months. The MSBSS was successful in being the primary sponsor of three symposia, six workshops, seven CE courses, and one Contemporary Concept in Toxicology (CCT) workshop at the 2016 SOT Annual Meeting in New Orleans last March. Finally the CCT workshop, "miRNA Biomarkers for Toxicology", chaired by Alison Harrill (University of Arkansas for Medical Sciences) and Warren Glaab (Merck), was a huge success!

The MSBSS reception was very well attended, with four graduate students and three postdoctoral fellows receiving awards that included money and a plaque. The MSBSS Best Paper for 2016 was awarded to Dr. Aditya Joshi, Dr. Dwayne Carter and colleagues. The 2nd annual MSBSS Networking Luncheon for Trainees provided 19 graduate students and postdoctoral trainees the opportunity to interact informally with experts from our membership. This luncheon was organized by postdoc rep, Dr. Susie Huang, and was highly successful! I thank all the mentors who participated in this luncheon. MSBSS trainees also participated in several events coordinated by the Graduate Student Leadership Committee (GSLC) at the 2016 Annual Meeting in New Orleans.

Finally, I am proud to announce an exciting new MSBSS sponsored workshop titled "Toxicoepigenetics: The Interface of Epigenetics and Risk Assessment," to be held November 2–4, 2016, in Tysons, Virginia (see page 5). I strongly encourage students and postdoctoral fellows to attend this SOT Contemporary Concepts in Toxicology (CCT) meeting.

*Bhagavatula Moorthy*

#### 2016-2017 Officers

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*University of North Carolina*

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## MSBSS Sponsored Symposia and Workshops

The MSBSS was the primary sponsor of three symposia and six workshops at the 2016 Annual Meeting, as well as a secondary or tertiary sponsor of several additional symposia, workshops and continuing education courses.

### Sponsored Symposia:

1. Systems understanding of the impact of the Nrf2 pathway on chemical toxicity and cell fate.
2. Using multi- and transgenerational effects of environmental exposures in diverse animal models for assessment of human health risks.
3. Novel roles of reactive oxygen species (ROS) in human diseases: Why ROS never gets stale.

### Sponsored Workshops:

1. Mitochondria as the central target of environmental contaminants, pharmaceutical agents, and toxicants: mechanisms of toxicity and disease.
2. The role of the epigenome in exposure effects, susceptibility, and public health.
3. Bioactivity-based margin of exposure safety assessment: the next stop along the road to 21st century safety assessments.
4. Multi-omics in predictive toxicology: Development and application in environmental monitoring programs.
5. Screening chemicals for neurotoxicity outcomes—using large datasets and multiple endpoints to develop “toxicity profiles”.
6. Which human cell lines should I use? Choosing the appropriate biological systems for high-throughput toxicity testing.

### Contemporary Concepts in Toxicology Workshop

The MSBSS sponsored the 2016 “miRNA Biomarkers for Toxicology” CCT workshop, chaired by Alison Harrill (University of Arkansas for Medical Sciences) and Warren Glaab (Merck), on March 12th in New Orleans, LA. MSBSS support funded travel scholarships for all presenting graduate students and postdoctoral fellows for the meeting. This SOT satellite meeting had approximately 130 attendees and 22 poster presentations.

### Continuing Education:

1. Discovery and Validation of miRNA Biomarkers Bridging Preclinical and Clinical Toxicity: Lessons Learned from Hepatotoxicity.
2. Basic Principles and Practices for Applying Epigenetics in Mechanistic Toxicology.
3. Advancing the Detection, Imaging, and Pitfalls in Monitoring Oxidative Stress in Health and Disease.
4. Next-Generation Sequencing in Toxicogenomics.
5. Exploring Chemical Space in the New Toxicity Testing Paradigm: From Data Curation to Computational Simulations.
6. Zebrafish As a Tool in Toxicology and Drug Discovery Screening.
7. Genetics and Population Variability in Chemical Toxicity: The What, the How, and So What?

## ***2016 Graduate Student and Postdoctoral Fellow Awards***

Highlights of MSBSS' annual reception are the graduate student and postdoctoral fellow awards that recognize excellence in research. These awards are supported by our endowment fund (see page 7), and provide an excellent opportunity for our students and postdocs to enhance their careers, and contribute to the quality of our Specialty Section. Below are the 2016 Awardees and the titles of their winning research.

### **2016 Graduate Student Award Recipients**

**1<sup>st</sup> Place: Rance Nault, Michigan State University, Advisor-Tim Zacharewski**  
"Pyruvate kinase isoform switching and hepatic metabolic reprogramming by the environmental contaminant 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)."



**2<sup>nd</sup> Place: Gloria Garcia, Oregon State University, Advisor-Robert Tanguay**  
"Identification of a conserved long noncoding RNA elevated in response to the xenobiotic activation of the aryl hydrocarbon receptor."



**3<sup>rd</sup> Place (Tie): Jeff Willy, Indiana University School of Medicine, Advisor-Ronald Wek**  
"Identification of novel UPR member IBTKalpha: linking autophagosome formation to the pathogenesis of non-alcoholic steatohepatitis."



**3<sup>rd</sup> Place (Tie): Vivekkumar Dadhania, University of Louisiana at Monroe, Advisor-Harihara Mehendale**  
"Wnt/B-catenin signaling drives thioacetamide-mediated heteroprotection against acetaminophen-induced lethal liver injury."

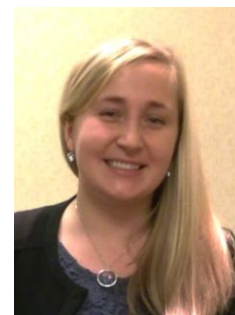


### **2016 Postdoctoral Award Recipients**

**1<sup>st</sup> Place: Dr. Anna Kopec, Michigan State University, Advisor-Jim Luyendyk**  
"RNA sequencing reveals induction of Mmp12 by fibrin(ogen) engagement of leukocyte alpha2B2 integrin as critical for liver repair after acetaminophen overdose in mice."



**2<sup>nd</sup> Place: Dr. Jenna Currier, US EPA, Advisor-Brian Chorley**  
"Investigating key event-based points of departure for adverse oxidative events in human bronchial epithelial cells exposed to zinc: a systems biology approach."



**3<sup>rd</sup> Place: Dr. Priyanka Trivedi, Harvard Medical School, Advisor-Vishal Vaidya**  
"Mechanistic role of phospholipase D4 in regulating kidney fibrosis."



## *MSBSS Commitment to Trainees*

The Molecular & Systems Biology Specialty Section welcomes student involvement and also encourages students to apply for graduate student and postdoctoral fellow awards given at the SOT annual meeting. Three awards are given each year that include a monetary award and plaque. For further information on awards, activities, and interests of the Molecular & Systems Biology Specialty Section, please contact your MSBSS student representatives:

**Derik Haggard:** [derik.haggard@gmail.com](mailto:derik.haggard@gmail.com) or **Emma Bowers:** [ecbowers@email.unc.edu](mailto:ecbowers@email.unc.edu)

or consult the **MSBSS Website:** <http://www.toxicology.org/groups/ss/MSBSS/index.asp>

or the **SOT award listings at:** <https://www.toxicology.org/awards/sot/awards.asp>

## *MSBSS Graduate Student and Postdoctoral Member Activities*

This year the MSBSS held their 2nd Annual Networking Luncheon for Trainees at the SOT Annual Meeting in New Orleans, LA. The luncheon at Capdeville provided 19 graduate students and postdoctoral trainees the opportunity to chat informally with 10 experts in molecular and systems biology in a fun, relaxed atmosphere. In addition to the MSBSS General Fund, the SOT Career Resources and Development Committee (CRAD) provided matching funds to sponsor this year's exciting event. The MSBSS extends special thanks Drs. Susie Huang for planning and organizing the Luncheon and Drs. Rais Ansari, Rob DeWoskin, Marc Gillespie, Caren Helbing, Shaun McCullough, Alvina Mehinto, Joel Meyer, Craig Rowlands, and Kristie Willett for volunteering their time as mentors. The MSBSS hopes to continue this tradition of hosting mentoring events for trainees at the SOT Annual Meetings.

MSBSS trainees participated in events coordinated by the Graduate Student Leadership Committee (GSLC) at the 2016 Annual Meeting in New Orleans.

- "Chat with an Expert" where trainees meet experts from industry, government, and academia to learn about their research and learn from their experiences.
- Tox ShowDown, an engaging quiz game with questions concerning toxicology as it relates to society, history, arts, and culture. Expert toxicologists put their knowledge to the test and competed against other experts for various prizes.
- Student/Postdoctoral Scholar Mixer - held each year to provide an opportunity for trainees to build valuable relationships with colleagues and learn more about their experiences, and introduce attendees to the various Specialty Sections, Regional Chapters, and Special Interest Groups in the society.

The MSBSS Graduate Student Representatives visited posters highlighting related research, and recruited new graduate students and postdoctoral associates to the specialty section. They also represented MSBSS at the annual GSLC meeting where future student outreach and development opportunities are organized.



## *Join us in Congratulating the 2016 Paper of the Year Awardees!*

### *2016 MSBSS Paper of the Year Award*



Congratulations to the third annual MSBSS Paper of the Year Award recipients. This year's MSBSS Paper of the Year Award went to Dr. Aditya Joshi, Dr. Dwayne Carter and colleagues. The paper was published in the Journal of Pharmacology and Experimental Therapeutics (2015) 353(1):201-212, and titled "Aryl hydrocarbon receptor-dependent stanniocalcin 2 induction by cinnabarinic acid provides cytoprotection against endoplasmic reticulum and oxidative stress."



### *MSBSS Sponsors Toxicopigenetics CCT Meeting November 2-4, 2016*

The last two SOT Annual Meetings have featured symposia, workshops, and continuing education courses on toxicopigenetics, organized by SOT Molecular and Systems Biology Specialty Section (MSBSS) Vice President-Elect Shaun D. McCullough, PhD, US Environmental Protection Agency (US EPA) and University of North Carolina at Chapel Hill, and Dr. Dolinoy. Realizing the interest and enthusiasm of the toxicology community, but also the need for communication between specialties, they have developed the upcoming SOT Contemporary Concepts in Toxicology (CCT) meeting "[Toxicopigenetics: The Interface of Epigenetics and Risk Assessment](#)," being held November 2–4, 2016, in Tysons, Virginia. "The goal of this meeting is to bring basic researchers and risk assessors together in the same room and to provide the venue for a collaborative discussion on how these two communities can work together to address critical questions in the field," says Dr. McCullough. The site for the meeting is:

<http://www.toxicology.org/events/shm/cct/toxicopigenetics.asp>

An interesting article (<http://toxchange.toxicology.org/p/bl/ar/blogaid=2008>) is also available on the ToXchange Communiqué Blog by Anthony M Franchini and Emma Bowers who discuss the emerging field of toxicopigenetics, and how "environmental exposure-induced changes to the epigenome can serve as both a mechanism of underlying exposure effects and a biomarker of both exposure and susceptibility".

## *Treasurer's Report*

The MSBSS General Fund Financial statement (as of June 2016) is below. Our specialty section is in good financial standing with sufficient funds to support our meeting and award activities going into 2017.

<b>MSBSS General Fund Financial Statement (as of June 2016)</b>	
<b>Ordinary Income/Expense:</b>	
<b>Income</b>	
Contributions	\$100
Proceeds from the CCT Mtg:MiRNA	\$12,311
Membership Dues (\$15/member)	\$3,400
Registration	\$2,041
Interest	\$2,056
<b>Total Income</b>	<b>\$19,908</b>
<b>Expenses</b>	
Awards - Sections	\$850
Plaques	\$251
Annual Meeting/Reception	\$3,997
Sponsorship of the CCT Mtg:MiRNA	\$6,000
Endowment 3:1 match/Y-2016	\$1,500
Executive Meetings	-
Mentoring Activities (matched by SOT-HQ)	\$886
Misc	\$106
<b>Total Expense</b>	<b>\$13,589</b>
<b>Excess (Deficiency) of Revenue over Expenses</b>	<b>\$6,319</b>
<b>Starting Value</b>	
<b>Ending Value</b>	<b>\$43,179</b>

The MSBSS Endowment Fund financial statement as of June 2016 is below showing a net gain of \$950. Interest on this fund's capital base is used to support our student and postdoc awards and activities in 2017. All of us in MSBSS heartily thank the endowment donors in 2016 for helping to keep this fund viable and growing!!

<b>MSBSS Endowment Fund Financial Statement (Quarterly Report - June 2016)</b>	
<b>Contributions</b>	
Member Contributions	\$500
MSBSS Matching Funds	\$1,500
SOT Matching Funds	\$500
Total Contribution	<b>\$2,500</b>
<b>Gain (loss) on Investments</b>	
Interests and Dividends	\$1,110
Capital gain (loss)	-\$1,110
Total Return	<b>\$0.0</b>
<b>Total Income</b>	<b>\$2,500</b>
<b>Expenses</b>	
Awards	\$1,550
other	-
<b>Total Expense</b>	<b>\$1,550</b>
<b>Excess (Deficiency) of Revenue over Expenses</b>	<b>\$950</b>
<b>Starting Value</b>	<b>\$39,530</b>
<b>Ending Value</b>	<b>\$40,480</b>

## ***HERE'S HOW YOU CAN QUINTUPLE YOUR DONATION!!***

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

YES, your contributions will be quintupled by "matching programs" from both SOT and MSBSS' general fund. SOT will match your contribution at a 1:1 ratio, and MSBSS will also match at 3:1. For example, your \$100 donation to the MSBSS endowment fund will be matched with \$100 from SOT and another \$300 from MSBSS yielding a whopping total of \$500 to our endowment fund! These funds are used to support our graduate and postdoctoral students, so give today and help our MSBSS grow and prosper!

***\*\*\*\*\*See the Page 3 for the Awards Supported by this Fund\*\*\*\*\****

## *Interested in Becoming an MSBSS Officer in 2017*

Want to learn a little more or do a little more to advance our specialty section? Consider joining our great group of leadership officers! The MSBSS leadership positions listed below will be on the ballot for 2017. You can find detailed information on Officer Duties at:

<https://www.toxicology.org/groups/ss/MSBSS/duties.asp> and in our bylaws at:

<https://www.toxicology.org/groups/ss/MSBSS/bylaws.asp> You can also contact current officers in positions of interest if you have any questions. **Those of us who have served on the MSBSS leadership have truly found it to be a fun and rewarding experience!**

### **OFFICERS TO BE ELECTED FOR NEW TERMS BEGINNING MAY 1, 2017**

**Vice President-Elect** (three year active term – VP-Elect, VP, Pres; one year as past-Pres)

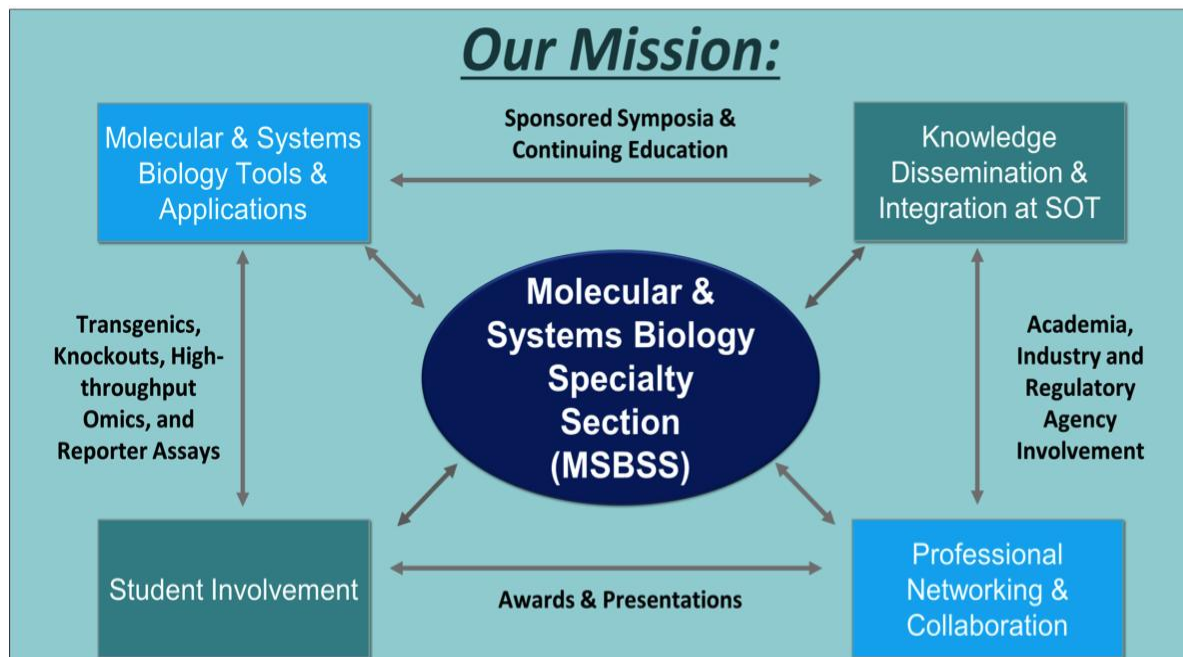
**Junior Councilor** (two year term, becomes the Senior Councilor in year 2)

**Secretary/Treasurer** (two year term)

**Postdoctoral Representative** (one year term)

**Graduate Student Junior Representative** (two year term, becomes the Senior Rep in year 2)

If you would like to **nominate yourself** for one of these positions, **or nominate someone you think would be a good candidate** (after receiving their approval first!), please **send the name and the position of interest to Marc Gillespie** [gillespm@stjohns.edu](mailto:gillespm@stjohns.edu) **at any time but no later than December 1, 2016**. The 2017 ballot will be sent to members in early 2017. The election results will be announced in our Spring 2017 newsletter, and at the MSBSS 2017 Annual Reception in Baltimore!



For more information about our Specialty Section, please visit our web site at:

<https://www.toxicology.org/groups/ss/MSBSS/index.asp>