

# Molecular and Systems Biology

## Specialty Section

### Fall 2017 Newsletter

#### 2017-2018 Officers

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#### Hello MSBSS Members

I want to first welcome our new MSBSS members. You have joined a growing, robust group of peers who are looking towards the future of toxicology. I would ask that you take the time to reach out to the members of the Specialty Section, get to know them, then take it one step further, and get involved in leading the MSBSS. Together we represent a broad swath of fields, and the Specialty Section has many opportunities before it.

There is great news on the awards front. The leadership team has worked diligently to increase award amounts. You can read more about the 2017 award recipients and the awards available for 2018 in this newsletter, and truthfully, this is a great opportunity for research students to receive the recognition they deserve. There are few greater achievements at any level of your training, be that undergraduate, graduate, or postdoctoral than the endorsement of your peers. Supporting our students and postdocs has always been a priority for the MSBSS. Be sure to apply by December 1, and please be sure to spread the word!

We have reviewed and sponsored an impressive slate of symposia and workshops for the 2018 Annual Meeting, and look forward to your participation in them all.

Finally, I want to thank the fantastic group of people who are working together to lead the MSBSS. They are providing the guidance and support needed to fulfill the mission of our Specialty Section including:

- Support of our researchers, students, and postdocs,
- Bringing the highest quality and most engaging science to our community and to SOT at large,
- Serving as a steward of our endowment and general funds, and making sure that those funds get invested back into our section, and
- Increasing our membership and the opportunities for MSBSS members.

Thank you for being a member and for supporting the MSBSS. Please let me know how we are doing, and reach out to the MSBSS group via twitter: @SOTMSBSS

*Marc E. Gillespie*

President, Molecular and Systems Biology Specialty Section

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# 2018 MSBSS Awards Information

MSBSS is dedicated to recognizing the exceptional research conducted by our membership with several awards, which are made possible by our Endowment Fund. The MSBSS Executive Committee is excited to announce that we have made important changes to our awards program this year, which include a substantial increase in the monetary value of each award and the creation of a new undergraduate research award for 2018. In addition to receiving a monetary award and accompanying plaque, recipients of the Paper of the Year, Postdoctoral Fellow, and Graduate Student Awards will be invited to present their work in an MSBSS-sponsored webinar during the year.

There is a brief summary of our awards below. Complete descriptions of the awards, the application requirements, and submission information can be found in the Awards section of the MSBSS website: <https://www.toxicology.org/groups/ss/MSBSS/awards.asp>.

**Please note: The deadline for submission of award applications is December 1, 2017.**

## **Paper of the Year Award**

- Paper must be a primary manuscript must be published (electronic or print) in a peer-reviewed journal during the 12-month period prior to the award application deadline (December 1<sup>st</sup>, 2016 to November 30<sup>th</sup>, 2017).
- Requires submission of a single PDF document including the published form of the manuscript and a one-page narrative describing the impact of the paper and the first author's role in the work.
- The first author of the selected paper will receive **\$750 and both the first and senior authors will receive an engraved plaque** at the MSBSS reception at the Annual Meeting.

## **Postdoctoral Fellow Research Award**

- Applicants must have completed a PhD or equivalent degree, submitted an abstract for presentation at the upcoming SOT Annual Meeting, and be a postdoctoral member of SOT (accepted or pending).
- Requires submission of a PDF document that includes a copy of the abstract submitted for the upcoming SOT Annual Meeting and a two-page narrative describing the hypothesis, background, and significance of the research, as well as the role that the applicant played in conducting the research.
- The applicant's postdoctoral research advisor must also submit a letter of reference.
- The winner will receive **\$750 and an engraved plaque** at the MSBSS reception at the Annual Meeting.

## **Graduate Student Research Award**

- Applicants must be full-time graduate students at the time of application submission, have submitted an abstract for presentation at the upcoming SOT Annual Meeting, and be a graduate student member of SOT (accepted or pending).
- Requires submission of a PDF document that includes a copy of the abstract submitted for the upcoming SOT Annual Meeting and a two-page narrative describing the hypothesis, background, and significance of the research, as well as the role that the applicant played in conducting the research.
- The applicant's graduate research advisor must also submit a letter of reference.
- First, second, and third place winners will receive **\$500, \$250, and \$100, respectively, and an engraved plaque** at the MSBSS reception at the Annual Meeting.

## **Undergraduate Research Award**

- Applicants must be full-time undergraduate students at the time of application submission, have submitted an abstract for presentation at the upcoming SOT Annual Meeting, and hold undergraduate affiliate status in SOT.
- Requires submission of a PDF document that includes a copy of the abstract submitted for the upcoming SOT Annual Meeting and a two-page narrative describing the hypothesis, background, and significance of the research, as well as the role that the applicant played in conducting the research.
- The applicant's Postdoctoral Research Advisor must also submit a letter of reference.
- At least one award will be given and the winner will receive **\$250 and an engraved plaque** at the MSBSS reception at the Annual Meeting.

# MSBSS Elections Are Coming Up!

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 2018. 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, 2018**

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)

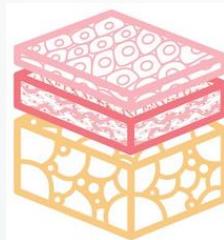
Postdoctoral Representative (one year term)

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 Shaun McCullough [mccullough.shaun@epa.gov](mailto:mccullough.shaun@epa.gov) at any time but **no later than December 1, 2017**. Candidates must submit a biosketch and photo for the ballot, which will be sent to members in early 2018. The election results will be announced in our Spring 2018 newsletter, and at the MSBSS 2018 Annual Reception in San Antonio!

## **2018 MSBSS-Endorsed Contemporary Concepts in Toxicology Meeting – March 10<sup>th</sup>, 2018**

MSBSS Vice President, Shaun McCullough, is the Chair for the upcoming CCT meeting titled “Building a Better Epithelium - Breaking the Barrier to the Next Generation of Toxicity Testing”. The meeting will be held in San Antonio, Texas on March 10<sup>th</sup>, 2018, the day prior to the start of our SOT Annual Meeting. This one-day meeting is designed to attract attendees from all sectors of toxicology who are interested in learning about the advantages and applications of readily-available organotypic models of the airway, skin, and intestinal epithelium for mechanistic, regulatory, and efficacy studies. This meeting will provide participants from academia, government, and industry with insight into the value, applicability, and potential of these new *in vitro* tools for studying toxicity in the airway, skin, and intestinal epithelium. Further, the financial and technical barriers to integrating these cutting-edge techniques into toxicology research and screening programs are relatively low, making their use attainable to almost any interested researcher. Toxicologists who are interested in, or currently using, organotypic models, as well as technology developers will have the opportunity to meet face-to-face, and foster collaborations to move the field forward. Presentations will be on the state of the science, and there will be moderated discussion sessions for attendees and speakers on advances, future needs and data gaps, as well as applications of these models to understand cellular and molecular mechanisms of toxicity. More information about the meeting and the preliminary agenda are available at: [www.toxicology.org/epithelium](http://www.toxicology.org/epithelium). Abstracts for poster presentations must be submitted by February 2<sup>nd</sup>, 2018.



## **Building a Better Epithelium**

*Breaking the Barrier to the  
Next Generation of Toxicity Testing*

# MSBSS Activities at the 2018 Annual Meeting

We had a wonderful presence at the 2017 SOT Annual Meeting with a total of eight MSBSS-endorsed scientific sessions, which was crowned by an exciting reception! The 2018 Annual Meeting will include 10 MSBSS-endorsed scientific sessions and one CE course in addition to the MSBSS-endorsed Contemporary Concepts in Toxicology meeting “Building a Better Epithelium: Breaking the Barrier to the Next Generation of Toxicity Testing,” which will be Chaired by MSBSS Vice President, Shaun McCullough, on Saturday, March 10<sup>th</sup>. To help you get ahead of your SOT Annual Meeting schedule planning, please find the titles, dates, and times of MSBSS-endorsed scientific sessions and our annual Specialty Section Reception below. Also, keep an eye on your email for updates regarding the MSBSS mentoring luncheon, which Kari Sant, Katelyn Lavrich, and Jessica Murray are in the process of planning. We will be updating everyone with details as soon as they become available!

## **Saturday, March 10<sup>th</sup>**

8:30 AM – 6:30 PM

- *Building a Better Epithelium: Breaking the Barrier to the Next Generation of Toxicity Testing CCT Meeting* ([www.toxicology.org/epithelium](http://www.toxicology.org/epithelium))

## **Sunday, March 11<sup>th</sup>**

1:15 PM – 5:00 PM (afternoon CE course)

- *NGS Technologies Enable Biomarker Development and Discovery in Toxicology*

## **Monday, March 12<sup>th</sup>**

1:45 PM – 4:30 PM

- *Revising Biology: Using Genomic and Epigenomic Editing to Gain Novel Insight into the Molecular Mechanisms of Toxic Exposure Effects and Susceptibility*
- *High-Throughput Transcript Profiling and Functional Assessment: From Screening to Systems Biology Strategies for Personal Chemical Safety Predictions*
- *Estrogen Receptor Signaling as a Mechanism of Developmental Toxicity*

Evening (time to be announced)

- MSBSS Specialty Section Reception

## **Tuesday, March 13<sup>th</sup>**

8:00 AM – 10:45 AM

- *Defining Domains of Applicability for Zebrafish within Toxicology: A Retrospective and Prospective Workshop*

1:30 PM – 4:15 PM

- *Mitochondria: Critical Targets in Pharmaceutical and Environmental Toxicity*
- *Effectively Leveraging Cellular Functional Genomics Strategies for Elucidating Chemical Mechanisms of Action*

## **Wednesday March 14<sup>th</sup>**

11:00 AM – 12:20 PM

- *Unlocking the 'Omics Archive: Enabling Toxicogenomic/Proteomic Investigation from Archival Samples*

1:30 PM – 4:30 PM

- *Atherosclerosis as a Model to Understand the Combined Effects of Environmental Chemical and Non-Chemical Stressors*
- *Microbiota as a Target or Mediator of Adverse Effects: Implications for Toxicology*

4:30 PM – 5:50 PM

- *The US TOX21 Collaboration: A Decade of Experience and a New Vision for the Future*

# MSBSS Awards Webinars

As part of the Molecular and Systems Biology Specialty Section's commitment to trainees, we are hosting two webinars to highlight the research of our Paper of the Year, Postdoctoral Fellow, and Graduate Student Award winners!

## **MSBSS Award Webinar Series: Graduate Student Research Award Recipients**

These three presentations will highlight the exceptional research being conducted by graduate students in the molecular and systems biology specialty section. **The webinar date and time will be announced in the coming weeks and will be free to all attendees.**

The Molecular and Systems Biology Specialty Section will be highlighting the research conducted by our 2017 Graduate Student Research Award recipients, Liz Mutter-Rottmayer (1st place, University of North Carolina), Gloria Garcia (2nd place, Oregon State University), and Amin Sobh (3rd place, University of California at Berkeley).

**Liz Mutter-Rottmayer** (University of North Carolina at Chapel Hill – Advisor: Dr. Cyrus Vaziri)  
Title: Defining a cancer cell-specific mechanism of resistance to Topoisomerase I poisons

**Gloria Garcia** (Oregon State University – Advisor: Dr. Robert L. Tanguay)  
Title: AHR-dependent control of gene expression: *in vivo* characterization and transcriptome profiling of a conserved long-noncoding RNA

**Amin Sobh** (University of California at Berkeley – Advisor: Dr. Chris Vulpe)  
Title: Genome-wide CRISPR-Cas9 Screens Identify Genes Involved in Toxic Responses to Arsenic and Acetaldehyde.

## **MSBSS Award Webinar Series: Postdoc and Paper of the Year Award Recipients**

The Molecular and Systems Biology Specialty Section will be highlighting the research conducted by our 2017 Postdoctoral Fellow Research Award recipient, **Dr. Sarah Lacher** (University of Minnesota) and Paper of the Year Award recipient, **Dr. Marpe Bam** (University of South Carolina). Dr. Lacher will discuss how the interactions between the master regulatory of the transcriptional response to oxidative stress, NRF2, and the genome regulate gene expression to mediate redox homeostasis, metabolism, and proteostasis. She will also discuss the influence of single nucleotide polymorphisms (SNPs) on NRF2-ARE binding and thus disease risk and how the experimental methods that she has developed can be applied to understand the broader relationship between SNPs and transcription factor binding. Dr. Bam will present his paper titled, "Dysregulated Immune System Networks in War Veterans with PTSD is an Outcome of Altered miRNA Expression and DNA Methylation," which was published in Scientific Reports. He will discuss the identification of differences in DNA methylation and miRNA profiles associated with immune system biology in peripheral leukocytes in post-traumatic stress disorder (PTSD) patients and the role of epigenetic mechanisms in PTSD. These two presentations will highlight the exceptional research being conducted by young investigators in the molecular and systems biology specialty section. **The webinar will begin at 12:00PM EST on Thursday, February 1st, 2018 and is free to all attendees. [Registration is required.](#)**

# Meet the New MSBSS Graduate Student Representative



Our Senior Graduate Student Representative, Emma Bowers (now Dr. Emma Bowers!) successfully defended her doctoral dissertation this summer in the University of North Carolina at Chapel Hill's Curriculum in Toxicology. While this marks the beginning of an exciting new journey for Emma, her husband, and their two dogs, but sadly for us, it means that she will no longer be able to serve as our Graduate Student Representative. Emma has accepted a post-doctoral position in the laboratory of Dr. Ken Ramos at the University of Arizona School of Medicine. In her new position she is researching the relationship between Long Interspersed Nuclear Element-1 (LINE-1) and disease. Approximately 17% of the human genome is comprised of LINE-1, a transposon that 'copies and pastes' itself into different loci throughout the genome via a reverse transcriptase-mediated mechanism. While the insertion of LINE-1 into protein coding, regulatory, or intronic regions of genes can drive the initiation and progression of several diseases, LINE-1 is also pathogenic via retrotransposition-independent mechanisms that alter chromatin remodeling dynamics to effect changes in gene expression. LINE-1 is frequently reactivated by environmental stressors, including tobacco smoke and chemical carcinogens. Emma's research focuses on understanding the relationship between environmental exposures, LINE1, and disease and developing biomarkers that can serve as a proxy for LINE1 activity. We'll look forward to hearing about her success as a postdoctoral fellow and beyond, and would like to thank her for her significant contributions to MSBSS! Best of luck in Arizona, Dr. Bowers!



Jessica Murray has been appointed to serve as one of our Graduate Student Representatives for the remainder of the current term, through May 1<sup>st</sup>, 2018. Jessica Murray is a doctoral Candidate in the Pharmacology Graduate Group at the University of Pennsylvania Perelman School of Medicine. She previously received a BS in Biology and Chemistry from the College of William and Mary. During the past three years, she has been a T32 Trainee in Environmental Health Sciences at the Center of Excellence in Environmental Toxicology (CEET) and is currently the recipient of a Pre-Doctoral Fellowship in Pharmacology/Toxicology from the Pharmaceutical Research and Manufacturers of America (PhRMA). Her research focuses on characterizing the bioactivation of polycyclic aromatic hydrocarbons (PAHs) and nitro-PAHs detected in diesel engine exhaust and ambient air pollution to further understand individual susceptibilities to lung cancer following these exposures. She is looking forward to serving as a Graduate Student Representative for MSBSS!

# Treasurer's Report: General Fund

The MSBSS General Fund Financial Statement (as of July 2017) is below. Our Specialty Section is in good financial standing with sufficient funds to support our meeting and award activities going into 2018.

<b>MSBSS Financial Statement (as of July 2017)</b>	
<b>Ordinary Income/Expense:</b>	
<b>Income</b>	
<b>Contributions</b>	<b>-</b>
<b>Proceeds from the CCT Mtg:MiRNA</b>	<b>\$500</b>
<b>Proceeds from CCT Mtg:Toxicological Epigenomics</b>	<b>\$524</b>
<b>Membership Dues (\$15/member)</b>	<b>\$3,220</b>
<b>Registration</b>	<b>\$1,857</b>
<b>Interest</b>	<b>\$1,701</b>
<b>Total Income</b>	<b>\$7,803</b>
<b>Expense:</b>	
<b>Awards - Sections</b>	<b>\$850</b>
<b>Plaques</b>	<b>\$276</b>
<b>Annual Meeting/Reception</b>	<b>\$5,343</b>
<b>Sponsorship of CCT Mtg:Toxicological Epigenomics</b>	<b>\$6,000</b>
<b>Endowment 3:1 match/Y-2017</b>	<b>\$2,250</b>
<b>Executive Meetings</b>	<b>-</b>
<b>Mentoring Activities (matched by SOT-HQ)</b>	<b>\$533</b>
<b>Misc</b>	<b>\$0</b>
<b>Total Expense</b>	<b>\$15,253</b>
<b>Balance:</b>	
<b>Net Assets Beginning of year</b>	<b>\$43,179</b>
<b>Excess (Deficiency) of Revenue over Expenses</b>	<b>-\$7,450</b>
<b>Net Assets as of September 2017*</b>	<b>\$35,729</b>

\* Entered values are rounded to the nearest dollar.

# Treasurer's Report: Endowment Fund

The MSBSS Endowment Fund has grown considerably this year. The financial statement as of June 2017 is below showing an excellent **net gain of \$7,161!** This increase is due to the generous contributions of our members, the SOT and MSBSS matching funds (see below), and good returns on investments. **Up to 4 % of the endowment fund's capital base can be used each year to support our student and postdoc awards and activities.**

## Extended For Another year! The MSBSS Endowment Matching Contribution Program

### HOW TO QUINTUPLE YOUR DONATION!!

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 whooping total of \$500 to our endowment fund! **These funds are used to support our undergraduate, graduate students, and postdoctoral sholars, so give today and help our MSBSS grow and prosper! If you are interested in making a donation to the MSBSS Endowment Fund, you can [make a donation online!](#)**

**All of us in MSBSS heartily thank our endowment donors for helping to keep this fund viable and growing!!**

<b>MSBSS Endowment Funds (Quarterly Report - June 2017)</b>	
<b>Contributions</b>	
<b>Member Contributions</b>	\$750
<b>MSBSS Matching Funds</b>	\$2,250
<b>SOT Matching Funds</b>	\$750
<b>Total Contribution</b>	\$3,750
<b>Gain (loss) on Investments</b>	
<b>Interests and Dividends</b>	\$1,155
<b>Unrealized Gain or (loss)</b>	\$3,506
<b>Total Return</b>	\$4,661
<b>Total Added</b>	\$8,411
<b>Expenses</b>	
<b>Awards</b>	\$1,250
<b>other</b>	-
<b>Total Expense</b>	\$1,250
<b>Added - Expenses =</b>	\$7,161
<b>Starting Value of the MSBSS Endowment Fund</b>	\$40,480
<b>Ending Value of the MSBSS Endowment Fund</b>	\$47,641