

**MOLECULAR AND SYSTEMS BIOLOGY SPECIALTY SECTION**  
**ANNUAL REPORT: 2017-2018**  
[May 1, 2017 to April 30, 2018]

**I. Officers/Committees:**

Officers	2017-2018	2018-2019
President:	Marc Gillespie	Shaun McCullough
Vice President:	Shaun McCullough	Dana C. Dolinoy
Vice President-Elect:	Dana C. Dolinoy	Jessica Plavicki
Secretary/Treasurer:	Robert S. DeWoskin	Robert S. DeWoskin
Past President	Bhagavatula Moorthy	Marc Gillespie
Senior Councilor:	Jill Franzosa	Tamara Tal
Junior Councilor:	Tamara Tal	Karilyn E. Sant
PDA Representative:	Karilyn E. Sant	Samantha C. Faber
Senior Graduate Student Repr.:	Katelyn Lavrich	Jessica Murray
Junior Graduate Student Repr.:	Jessica Murray	TBD

**Committees:** N/A

**Elected in 2018:**

Vice President-Elect: Jessica Plavicki; Physiology & Laboratory Medicine, Brown University  
Junior Councilor: Karilyn E. Sant; Envr. Health Sciences, University of Massachusetts Amherst  
Postdoctoral Representative: Samantha C. Faber; Curriculum in Toxicology, UNC Chapel Hill  
Graduate Student Representative: Jessica Murray; Syst. Pharm/Transl Thera., U of Pennsylvania

**Membership:** MSBSS currently has 192 members.

**II. Activities:**

**2018 SOT Annual Meeting**

**MSBSS Reception was held in San Antonio, TX on March 12, 2018**

Approximately 100 people were in attendance.

President Marc Gillespie called the meeting to order.

Meeting Agenda: (see Attachment 1)

**Collaborative mentoring event with Mechanisms and In Vitro and Alternative Methods Specialty Sections**

Attended by 30 mentors and 70 mentees

Held at Casa Rio on March 13<sup>th</sup>, 2018

Organizers: Dr. Kari Sant (Postdoctoral Rep.), Katelyn Lavrich (Senior Graduate Student Rep.), and Jessica Murray (Junior Graduate Student Rep.)

This year the MSBSS held their 1st annual Mentoring Reception for trainees of MSBSS, Mechanisms SS, and IVAM SS at the SOT Annual Meeting in San Antonio, TX. The Mentoring Reception at Casa Rio on Tuesday, March 13<sup>th</sup>, brought students, postdocs, and mentors in MSBSS-related fields together to facilitate networking and career development in a fun, relaxed atmosphere. Over 70 graduate students and postdoctoral trainees had the opportunity to meet with 30 experts working in industry, academia, government, consulting, and non-profit. 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 and our co-sponsors Mechanisms SS and IVAM SS contributed funds as well. The event received very positive feedback from both mentors and mentees in attendance and MSBSS is currently planning to organize another collaborative mentoring event for the 2019 Annual Meeting.

**Awards:**

During the 2017-2018 year, MSBSS revised its award descriptions to improve clarity and increase the monetary value of each award. We also began offering the opportunity for award recipients to present their work in MSBSS-sponsored webinars (one for the paper of the year and postdoctoral research award recipients and another for the three graduate student award recipients). We believe that these award webinars will provide new opportunities for trainees conducting excellent research to gain experience presenting their work and increase their profile in the field while also encouraging applications for MSBSS awards through advertising and increased benefit to recipients. To facilitate the development of the new MSBSS award webinars, we invited the recipients of the 2017 Paper of the Year, Postdoctoral Research Award, and Graduate Student Research Awards to present webinars in February 2018 and November 2017, respectively.

Additionally, in an effort to recognize and encourage the participation of undergraduate researchers in toxicology research, we also established the MSBSS Undergraduate Research Award, which was awarded for the first time at the 2018 SOT Annual Meeting.

**Postdoctoral Research Award (8 applicants)**

**Samantha Faber, PhD – University of North Carolina at Chapel Hill**

*“Diesel Exhaust Particles Downregulate PI3K/mTOR Signaling and Mitochondrial Bioenergetics in a Novel Organotypic Model of the Airway Microenvironment”*

**Graduate Student Research Awards (17 applicants)**

**1st Place: Julia Tobacyk – University of Arkansas**

*“Mouse Population-Based Evaluation of Urinary Protein and miRNA Biomarker Performance Associated with Cisplatin Renal Injury”*

**2nd Place: Abhishek Venkatratnam – University of North Carolina at Chapel Hill**

*“Collaborative Cross (CC) Mouse Population-Based Dose-Response Analysis of Liver Transcriptomic Responses to Trichloroethylene (TCE) at the Level of Genes and Pathways”*

**3rd Place: Prarthana Shankar – Oregon State University**

*“The Role of a Novel Long Non-Coding RNA in the Regulation of Sox9b and Its Contribution to TCSS-Induced Toxicity Endpoints”*

**Paper of the Year Award (8 applicants)**

This year's MSBSS Paper of the Year Award went to Priyanka Trivedi, PhD and coauthors from the Harvard Medical School. The paper titled "*Targeting Phospholipase D4 Attenuates Kidney Fibrosis*" (DOI: 10.1681/ASN.2016111222) was published in the Journal of the American Society of Nephrology in December of 2017.

**Undergraduate Student Research Award (9 applicants)**

MSBSS offered an undergraduate research award for the first time this year and we received nine applications. Sarah Kazzaz received the 2018 award for her work titled "An Aryl Hydrocarbon Receptor from the Caecilian Amphibian *Gymnopsis* multiplicate Exhibits Low Dioxin Responsiveness."

**2018 SOT Annual Meeting Courses/Sessions:**

The MSBSS was the primary endorser of five symposia at the 2018 Annual Meeting, as well as a secondary or tertiary endorser of four additional symposia.

**Symposia with MSBSS as the Primary Endorser:**

1. High-Throughput Transcriptomics: Addressing the Human Risk Assessment Challenges of Chemical Coverage, Metabolism, and Population Variation
2. Impact of Japanese Toxicogenomics Studies: TG-GATES and PerceLlome as Gateways to Dose-Response Analysis, Toxicity Predictions, and Systems Biology Understanding
3. The Microbiome: A Missed Opportunity For Improving Risk Assessment
4. Functional Toxicogenomics Applications in Model Organisms: Investigating Toxicity Mechanisms and Chemical-Gene Interactions
5. Translational Frontiers in Epigenotoxicology: Epigenetic Mechanisms and Animal Models of Human Development and Neurotoxicity

**Symposia with MSBSS as the Secondary or Tertiary Endorser:**

1. Metabolic Dysfunction in Environmental-Related Disorders: Learning Across Disciplines
2. Systems Toxicology Approaches for E-Vapor Assessment
3. NGS-Based, Genome-Wide-Technologies in Biomarker Development for Xenobiotic Toxicity and Exposure
4. Scaling Barriers: Cellular Dynamics of Blood-Brain Barrier Developmental Toxicity

**Endowment Fund Details and Treasurers Report:**

The currently available MSBSS General Fund financial statement as of May 2018 is shown below.  
 [Note: Reimbursement for the annual meeting mentoring activities has not yet posted.]

<b>MSBSS Financial Statement (as of May 2018)</b>	
<b>Ordinary Income/Expense:</b>	
<b>Income</b>	
Contributions	\$0
Other	\$0
Registration	\$1,739
<b>Total Income</b>	<b>\$1,739</b>
<b>Expense:</b>	
Awards - Sections	\$1,400
Plaques	\$315
Annual Meeting/Reception	\$4,106
Endowment 3:1 match/Y-2018	\$0
Executive Meetings	\$0
Mentoring Activities (to be matched by SOT-CRAD)	\$972
Misc	\$0
<b>Total Expense</b>	<b>\$6,792</b>
<b>Balance:</b>	
<b>Net Assets Beginning of year</b>	<b>\$35,729</b>
Excess (Deficiency) of Revenue over Expenses	-\$5,054
<b>Net Assets as of May 2018*</b>	<b>\$30,675</b>

\* Entered values are rounded to the nearest dollar.

The quarterly MSBSS endowment fund statement as of March 2018 is shown below. The MSBSS endowment fund continues to benefit from SOT's and the MSBSS endowment matching program, where SOT matches the contribution at a 1:1 ratio, and MSBSS matches at 3:1. The MSBSS endowment match of \$2700 from the general fund will be made in July 2018.

<b>MSBSS Endowment Funds (Quarterly Report - March 2018)</b>		
<b>Contributions</b>		
	Member Contributions	\$900
	MSBSS Matching Funds <u>(Note: \$2700 to be added in July 2018)</u>	in progress
	SOT Matching Funds	\$900
	Total Contribution	<b>\$1,800</b>
<b>Gain (loss) on Investments</b>		
	Interests and Dividends	\$968
	Unrealized Gain or (loss)	\$2,289
	Total Return	<b>\$3,257</b>
	<b>Total Added</b>	<b>\$5,057</b>
<b>Expenses <u>(Note: 2018 expenses will be included in the next quarterly report)</u></b>		
	Awards	\$1,600
	other	-
	<b>Total Expense</b>	<b>\$1,600</b>
	<b>Added - Expenses =</b>	<b>\$3,458</b>
	<b>Starting Value of the MSBSS Endowment Fund</b>	<b>\$47,641</b>
	<b>Ending Value of the MSBSS Endowment Fund</b>	<b>\$51,099</b>
<b>Awards and Funds Available from the MSBSS Endowment</b>		
	Amount Expended on Awards in 2018	\$1,600
	Amount Provided from Endowment Fund	\$1,250
	<b>Excess (Deficiency)</b>	<b>\$350</b>
	<b>Amount Provided by the MSBSS General Fund</b>	<b>\$350</b>
	<b>Est. Endowment Funds Available for 2019 Awards*</b>	<b>\$2,044</b>

\* The estimated amount of Endowment Funds that will be available for awards in the next year is based upon 4% of the Fund's ending value as of the June Quarter in the preceding year.

## **Teleseminars/Webinars**

MSBSS hosted three webinars during the 2017-2018 year:

### **Webinar #1**

**Title:** *Accepted! – Preparing a Successful Graduate School Admissions Package*

**Date:** November 10, 2017

**Chair:** Shaun D. McCullough

**Co-Chair:** Mindy Reynolds

**Co-sponsors:** Education Committee/Undergraduate Education Subcommittee, Career Resources and Development Committee

**Abstract:** The biomedical sciences are host to a broad range of exciting and engaging prospects to pursue graduate training in cutting-edge research science; however, taking part in these opportunities requires a well-refined and impactful graduate school admissions application package. Just in time for upcoming admissions deadlines, the Society of Toxicology's Molecular and Systems Biology Specialty Section and Education Committee proudly present an interactive webinar that will include short presentations on key aspects of the graduate school application from graduate program directors and admission committee members at leading graduate institutions. **Dr. Aaron Bowman (Associate Professor in Pediatrics, Neurology, and Biochemistry, and Director of the Training Program in Environmental Toxicology at Vanderbilt University)** will provide an overview of the graduate admissions process, perspectives on how admissions committees review applications, invite applicants for interviews, and make decisions on admissions offers. He will also discuss the role of GRE scores and grades in the admissions process. **Dr. Dana Dolinoy (Associate Chair of Nutritional Sciences and Associate Professor of Environmental Health Sciences & Nutritional Sciences at the University of Michigan School of Public Health)** will discuss how to select the best degree program for you and how to craft an impactful research statement. **Dr. Lauren Aleksunes (Associate Professor and Director of the Joint Graduate Program in Toxicology at Rutgers University)** will provide insight on how to write a meaningful personal statement that can help your application stand out. These short presentations will be followed by a live discussion session where our panel experts will answer attendee questions to provide a more in-depth view that will help you gain a better understand of the graduate admissions process and strengthen your graduate school application to help you on your path to getting that acceptance letter.

**Run length:** 75 minutes

**Attendees:** 56

### **Webinar #2**

**Title:** *MSBSS 2017 Graduate Student Award Webinar*

**Date:** November 17, 2017

**Chair:** Shaun D. McCullough

**Co-Chair:** Karilyn Sant

**Co-sponsors:** N/A

**Abstract:** The Molecular and Systems Biology Specialty Section will be highlighting the research conducted by our 2017 Graduate Student Research Award recipients, Liz Mutter-Rottmayer (1<sup>st</sup> place, University of North Carolina), Gloria Garcia (2<sup>nd</sup> place, Oregon State

University), and Amin Sobh (3<sup>rd</sup> place, University of California at Berkeley). These three presentations will highlight the exceptional research being conducted by MSBSS graduate students exploring the molecular mechanisms of chemoresistance, the role of non-coding RNAs in aryl hydrocarbon receptor-mediated exposure effects, and the use of CRISPR-Cas9 gene editing to identify genes associated with susceptibility to toxic exposures. This webinar was supported by funding from the SOT Subcommittee on Non-SOT Annual Meeting Funding.

**Run length:** 60 minutes

**Attendees:** Not recorded

### **Webinar #3**

**Title:** MSBSS Award Webinar Series: Postdoctoral Fellow and Paper of the Year Award

**Recipients**

**Date:** February 1, 2018

**Chair:** Shaun D. McCullough

**Co-Chair:** Jill Franzosa

**Co-sponsors:** N/A

**Abstract:** 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.

**Run length:** 60 minutes

**Attendees:** Not recorded

### **Newsletters:**

The Fall 2018 MSBSS newsletter is currently being planned for delivery to the membership around September-October 2018; the Fall 2017 newsletter is available on our MSBSS web site in ToXchange.

### **Contributions to the SOT Main or MSBSS ToXchange websites:**

- Recording of “Accepted! – Preparing a Successful Graduate School Admissions Package” webinar.
- Recording of “MSBSS 2017 Graduate Student Award Webinar”.

- Recording of “*MSBSS Award Webinar Series: Postdoctoral Fellow and Paper of the Year Award Recipients*”.
- The [MSBSS Fall 2017 Newsletter](#) .
- 2018 Officer Candidate Biosketches - to MSBSS members via ToXchange.
- Numerous announcements for webinars or other items of interest to members – to MSBSS members via ToXchange.

## **Other Specialty Section Activities in 2017-2018:**

### **Contemporary Concepts in Toxicology Meeting**

The MSBSS sponsored a SOT Contemporary Concepts in Toxicology (CCT) meeting titled, “*Building a Better Epithelium: Breaking the Barrier to the Next Generation of Toxicity Testing*” on Saturday, March 10th, 2018 (8:30 AM – 5:30 PM) in the Henry B. Gonzalez Convention Center. This CCT meeting was Chaired by MSBSS Vice President Shaun D. McCullough and Co-chaired by RSESS Vice President Marie C. Fortin and hosted nine speakers and 70 attendees from around the world to discuss the state-of-the-science and directions forward in the development and application of organotypic epithelial models in toxicology. The full-day meeting also incorporated a poster session where attendees had the opportunity to present their research and a mentoring lunch that was designed to facilitate the development of mentor-mentee relationships at all career stages. Additional information about this CCT meeting can be found at [www.toxicology.org/epithelium](http://www.toxicology.org/epithelium).

**Attachment 1 – 2018 MSBSS Reception Agenda (San Antonio, TX)**

Molecular &amp; Systems Biology Specialty Section Reception

Tuesday, March 12, 6:00 – 7:30 pm

<u>Officers</u>	<u>2017-2018</u>
President:	Marc Gillespie
Vice President:	Shaun McCullough
Vice President-Elect:	Dana C. Dolinoy
Secretary/Treasurer:	Robert S. DeWoskin
Past President	Bhagavatula Moorthy
Senior Councilor:	Jill Franzosa
Junior Councilor:	Tamara Tal
PDA Representative:	Karilyn E. Sant
Senior Graduate Student Repr.:	Emma Bowers
Junior Graduate Student Repr.:	Katelyn Lavrich

MSBSS Annual Meeting Agenda (Marc E. Gillespie)

- Introduction
- New awards
- Continued evolution of our award speeches.
- Pitch on endowment
- Membership for MSBSS
- Career development
- Award opportunities
- Mentorship
- Introduce Current Officers:
- Reports:
  - Shaun - New Directions
  - Shaun - CCT Recap
  - Shaun - Scientific Proposals - Stress process, come to MSBSS early
  - Rob – Finances
  - Katelyn - Post-Doc Graduate student training and mentoring - registered and cannot attend waiting list - survey would be great.
  - Jill – Awards
  - Jill closes out