

Mixtures Specialty Section Newsletter

Volume 6, Issue 2

March 2016

President's Message

David Herr, PhD
MixSS President



Hello, to all the members of the Mixtures Specialty Section. The 2016 Society of Toxicology meeting in New Orleans is nearly upon us. I am looking forward to seeing you there, especially at the Specialty Section reception on Tuesday evening from 6:00 - 7:30 p.m. Please come and socialize, meet other

mixtures toxicologists, and get involved in the Mixtures Specialty Section. Also, be sure to attend the sessions and posters related to mixtures - a great way to learn what others are investigating. It will soon be time to suggest Workshops, Symposia, and Continuing Education classes for the 2017 SOT meeting. Get together with your peers at this year's meeting and start thinking!

As I have mentioned before, mixtures toxicology is one of the most relevant aspects of the science of toxicology. We are continuously exposed to multiple chemicals, drugs, and non-chemical factors. Cumulative Risk Assessment is the real world. Combinations of chemicals with different modes of action, complex mixtures containing unknown chemicals, interactions of chemicals with non-chemical factors (such as diet, exercise, psychosocial stressors), screening for interactions using high throughput technologies, systems biology approaches are all difficult topics. But, exposure to mixtures is the reality of everyone's daily lives. Advances in basic scientific knowledge of biological pathways will facilitate development of high-throughput assays to feed into computer predictions of toxicity. However, living organisms are highly complex, and it is the alteration of their ability to function that needs to be accurately predicted. We need more bright and innovative

Mixtures at the 2016 SOT Annual Meeting

Cynthia Rider, PhD, DABT
MixSS Vice President-Elect
NIEHS/DNTP

The SOT 2016 meeting is right around the corner, and we want to be sure you don't miss any of the exciting mixtures events. Find our guide to all things mixtures at SOT below.



Monday, March 14

The officers' meeting will take place first thing Monday morning to plan for the week. Although this is a closed meeting, your suggestions for how to improve MixSS and better serve the mixtures community are welcome any time (cynthia.rider@nih.gov).

When: 6:30 – 8:00 am

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scientists to continue tackling these issues.

The Specialty Section has continued to grow every year. However, we need your help to continue an upward growth rate. When you attend meetings, conferences, etc., mention the Mixtures Specialty Section as a means to stay in contact with other researchers with common interests. Encourage your peers to join the Mixtures Specialty Section. Word of mouth is a powerful means of publicity.

We have updated the Mixtures Specialty Section web page - please take a look:
<http://www.toxicology.org/groups/ss/mix/index.asp>
To increase our ability to help you publicize your work, please send us notifications of your publications, mixture-related workshops or seminars. We can post them on the web page to help increase visibility.

Finally, if you have ideas on how the Mixtures Specialty Section can serve you better, please send them to your officers.

Sincerely,

David Herr

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Monday, March 14 (continued)

Poster Session: Toxicity of Metal Mixtures

When: 9:30 am – 12:45 pm

Where: Exhibit Hall

Abstract Numbers: 1268 – 1277

Poster Board Numbers: P417 – P426

Poster Session: Mixtures

When: 1:15 – 4:30 pm

Where: Exhibit Hall

Abstract Numbers: 1429 – 1455

Poster Board Numbers: P158 – P184

Workshop Session: Quantitative Cumulative Risk Assessment: Is It Feasible Today?

Session chairs: Gregory Brorby (ToxStrategies, Inc.) and Moiz Mumtaz (ATSDR)

Speakers: G. Rice (US EPA), L. Zeise (California EPA), J. Wickliffe (Tulane University), M. Suh (ToxStrategies, Inc.), J. Peters (Boston University)

When: 2:00 – 4:45 pm

Where: CC Room R04

Tuesday, March 15

Workshop Session: Unknown, Unknowns: Exploring the Unidentified Fraction of Complex Mixtures

Session chairs: Cynthia Rider (NIEHS) and Jane Ellen Simmons (EPA)

Speakers: K. Anderson (Oregon State University), D. Jones (Emory University), J.E. Simmons (US EPA), R.H. McKee (American Petroleum Institute), G. Rice (US EPA)

When: 9:30 am – 12:15 pm

Where: CC Room 208

MixSS Reception – Mix It Up!

Kick back with your mixture colleagues and find out the latest happenings. Join us in recognizing the winners of the Top Mixtures Abstract, Grad Student and Post doc Awards. Test your knowledge of Mixtures Trivia in Mixtures Jeopardy!

MixSS Meeting/Reception

When: Tuesday, March 15, 6:00 pm – 7:30 pm

Where: Hilton Riverside - Grand Salon 22



Bring your friends!

Laissez les bon temps rouler!

Thursday, March 17

Workshop Session: Potential Health and Environmental Effects of Unconventional Hydraulic Fracturing

Session chairs: Travis Knuckles (West Virginia University) and Judith Zelikoff (New York University Medical Center)

Speakers: J. Snawder (NIOSH), T. Polen (West Virginia Department of Environmental Protection), M. McCawley (West Virginia University), B. Yan (Columbia University), J.T. Zelikoff (New York University Medical Center)

When: 9:30 – 12:15 am

Where: CC Room R04

Call for 2017 Session Proposals

David Herr, PhD
MixSS President
US EPA

All Mixtures Specialty Section members are strongly encouraged to submit scientific session proposals (continuing education course, workshop, symposia, platform or poster proposals) for the 2017 SOT meeting in New Orleans. The MixSS has an opportunity to assume a leadership role in addressing the important and complex issues surrounding mixtures toxicology and cumulative risk assessment by virtue of having outstanding membership expertise across government, industry and academia. For this reason, the MixSS Executive Committee requests that members consider developing scientific session proposals for the 2017 SOT Annual Meeting to highlight the innovative science which is being conducted by our membership. Proposals are due to SOT headquarters by April 30th, 2016. In order to allow for feedback from the Mixtures Specialty Section, submissions should be provided to Dr. Margaret Whittaker (Mwhittaker@toxservices.com) by April 1st, 2016. If you have any questions, please feel free to contact Margaret Whittaker, MixSS Vice President.

Topics of interest:

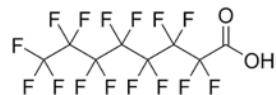
- **Combined exposures**
 - Predictive models of mixture toxicity
- **Cumulative risk assessment**
 - Component-based approaches
 - Whole mixtures approaches
 - Evolving regulatory processes and needs for cumulative risk assessment
- **Chemical and nonchemical stressors**
 - Physical and chemical stressors
 - Psychosocial and chemical stressors
- **Complex mixtures**
 - Environmental contaminants
 - Nanomaterials as mixtures
 - Herbal supplements
 - Tobacco smoke/e-Cigarettes
 - eWaste
 - Fracking fluids
- **High throughput screening of mixtures**
- **Mixtures in epidemiology research**

Joint RASS-MixSS Webinars

Kembra Howdeshell, PhD
MixSS Webinar Coordinator
NIEHS/DNTP

Another successful round of the Joint Risk Assessment Specialty Section (RASS)-MixSS Webinars have taken place in the 2015-2016 RASS webinar series. Audio recordings and slides for the presentations from past webinars are available on the MixSS website under downloads:
<http://www.toxicology.org/groups/ss/mix/Downloads.asp>.

The first of two webinars co-sponsored by RASS-MixSS was on December 9, 2015. It was a two part presentation focusing on perfluorinated chemicals (PFCs) and covering both toxicology and regulatory issues. PFCs are manufactured chemicals that are used to make products resistant to stains, grease, and water. The two presentations were “The extensive toxicology data behind alternative short-chain fluorinated product technology” by Robert C. Buck, Ph.D. (The Chemours Company) and “PFAS and their non-fluorinated alternatives in ‘European Law and Industry’ – current and future challenges” Stefan Posner (Swerea IVF)



The second presentation in the series was provided by Thomas Webster, D.Sc (Boston University School of Public Health) and addressed how mixtures concepts (e.g., additivity, interactions) differ between toxicology and epidemiology. Dr. Webster also provided an overview of the outcomes from a 2015 NIEHS workshop on “Statistical Approaches for Assessing Health Effects of Environmental Chemical Mixtures in Epidemiology Studies.” Over 100 people viewed the webinar, indicating that the topic of mixtures in epidemiology and toxicology is clearly of interest to RASS and MixSS members.

Please provide suggestions for future RASS-MixSS webinar speakers or topics to MixSS webinar coordinator Kembra Howdeshell at howdeshellkl@niehs.nih.gov.

New MixSS Website

Julia Rager, PhD
Outgoing MixSS Post doctoral Representative and
Incoming Councilor
ToxStrategies, Inc.

We are excited to announce the redesign of the MixSS website! Please let us know what you think of it so far.

<http://www.toxicology.org/groups/ss/mix/index.asp>

Along with the changes to the website format, we have been working with the graphics department at SOT headquarters to design a new banner...



And a new logo...



You can find MixSS objectives, how to become a member, current and past officers, newsletter and annual report archives, previous award winners, photos, webinars, and more on the new website!

We would like this page to be a resource for members. In order for that to be a success, we have to know what kinds of things you would like to see on the website. Some ideas we have been discussing include:

- Highlighting mixtures publications from members
- Adding mixtures news items of interest
- Having a section for upcoming mixtures events

Please send your ideas and feedback to Julia Rager (jrager@toxstrategies.com).

New MixSS Officers

Vice President-Elect: Chris Gennings, PhD



Dr. Chris Gennings has been elected to the position of Vice President-Elect. We are thrilled to welcome Chris as a new MixSS Officer. She is an expert in mixtures statistics and has been actively engaged in the field for 25 years. Her work on statistical methods development spans both toxicology and epidemiology. Recent work includes developing a body burden index with empirically derived weights linked to health outcomes; development of a holistic measure of wellness using biomarkers of effect; development of a nutrition index; development of weighted quantile sum (WQS) regression – a method that is robust to confounding concerns based on complex correlations among exposure to environmental mixtures; and development of tests for sufficient similarity, a novel approach that complements current cumulative risk assessment methods and does not require the default assumption of additivity.

Councilor: Julia Rager, PhD

Dr. Julia Rager has been an active member of the MixSS leadership since serving as the graduate student representative in 2011. During her tenure as post-doctoral representative, Julia led the effort to update the website and worked to bring new members to the MixSS in her activities with the PDA. She is a Scientist III consultant with ToxStrategies, Inc. Julia has extensive experience conducting comprehensive human health evaluations on environmental chemicals, including complex mixtures. She received a

MSEE and PhD from the University of North Carolina, and participated as an ORISE post-doctoral research fellow at the US EPA. Julia has contributed to the field of mixtures toxicology by comparing toxicogenomic effects of multiple air pollutant mixtures, and by contributing to the human exposome field through the non-targeted chemical assessment of environmental media. She is currently researching methods to computationally predict human toxicity induced by complex environmental mixtures



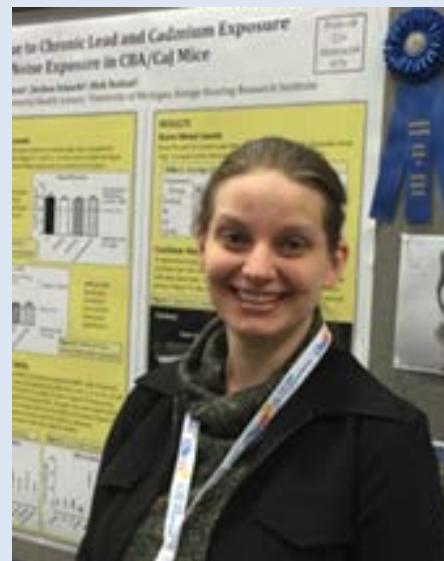
Postdoctoral Representative: Justin Conley, PhD

Dr. Justin Conley is joining us as the Postdoctoral Representative for the MixSS. He is currently a postdoctoral toxicologist in the Reproductive Toxicology Branch at the USEPA in Research Triangle Park, NC where he conducts in vitro and in vivo experiments on endocrine disrupting compounds, both individually and as mixtures, in the laboratories of Dr. Vickie Wilson and Dr. Earl Gray. Justin received his BS in Environmental Science and Biology from Warren Wilson College in Asheville, NC and MS in Environmental Science from the University of Tennessee – Chattanooga. He completed his PhD in Environmental Toxicology from North Carolina State University in 2014 where he studied the bioaccumulation and toxicity of selenium and mixtures of common ions at the base of aquatic foodwebs.



Graduate Student Representative: Krystin Carlson

Krystin Carlson will be the new MixSS Graduate Student Representative. She is a PhD candidate in the School of Public Health at the University of Michigan. She completed her Bachelor of Science in Environmental Health Science at Purdue University. For her thesis, Krystin is exploring how metals impact the hearing system. She has developed a mouse model for metal exposure combinations concurrent with noise exposures. Her research also involves exploring how non-essential metals, essential metals, and noise create resilience or damage to auditory function for electronic waste workers in Accra, Ghana. At the 2015 SOT, Krystin won the Top Abstract Award from the Mixtures Specialty Section.



Thank you to our outgoing officers!

Vickie Wilson (Councilor) has done an excellent job in her role as senior councilor of the MixSS. She recently led the committee to select the best mixtures abstracts from the SOT 2016 abstract pool and has been actively involved in publicizing the MixSS.



Vickie Wilson (right) with lab members at the 2015 MixSS reception

Axelle Marchand has completed her term as Graduate Student Representative. Axelle has been a wonderful MixSS officer – serving on the committee to review awards and giving input on all MixSS activities.



Axelle receiving the 2015 MixSS Best Graduate Student Award

Serving as an officer is a great way to get involved in your MixSS!

To run for office, contact President David Herr (herr.david@epa.gov). Open positions for the 2017-2018 term include secretary-treasurer, councilor, post doctoral representative and graduate student representative.

State of the MixSS

Founded: 2006

Financials: \$5,902 as of Nov 30, 2015

Award sponsors: Wiley and ToxServices LLC

Upcoming Events

Workshop: Addressing Challenges in the Assessment of Botanical Dietary Supplement Safety

Dates: April 26-27, 2016

Location: Lister Hill Auditorium, NIH, Bethesda, MD

Website:

<http://ntp.niehs.nih.gov/about/presscenter/events/2016/index.html>

The safety of botanical dietary supplements, hereafter referred to as botanicals, is an important public health issue. According to the 2012 National Health Interview Survey, 17.7 percent of Americans reported having used nonvitamin, nonmineral dietary supplements (including botanicals) in the past 12 months. Botanicals pose several unique challenges to efficacy and safety evaluation because of their inherent complexity and potential for wide variability in nominally related products. The interrelated challenges associated with the evaluation of botanicals include: (1) developing methods and criteria for assessing phytoequivalence (i.e., similarity in chemical composition and biological activity) of botanicals, (2) identifying the active constituent(s) or patterns of biological response of botanicals, and (3) assessing absorption, distribution, metabolism, and elimination (ADME) of botanicals. This workshop will engage experts from multiple disciplines to focus on practical approaches for addressing these challenges.



Register to attend in person or view the webcast. Registration is free and open to the public.

Contact Cynthia Rider (cynthia.rider@nih.gov) with questions about the meeting.