

Mixtures Specialty Section Newsletter

Volume 6, Issue 1

September 2015

President's Message

David Herr, PhD
MixSS President



Hello to all the members of the Mixtures Specialty Section. I was glad to see many of you at this year's Society of Toxicology meeting, and I am honored to serve as the President of the Specialty Section. As we all know, chemical mixtures is one of the "800 pound gorillas" in the room of toxicology.

Good advances have been made in mixtures risk assessment, but there is still a long way to go. Combinations of chemicals with different modes of action, complex mixtures containing unknown chemicals, interactions with non-chemical stressors, screening for interactions using high throughput technologies, systems biology approaches - the list goes on..... Several of the workshops or symposium that we sponsored were accepted by the Society of Toxicology for the 2016 meeting, so be sure to make time to stay up-to-date on the latest issues in mixtures toxicology. This is a great time to be a member of such a highly relevant specialty section.

The Specialty Section has continued to grow every year. However, we need your help to continue the 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. Word of mouth is a powerful means of publicity.

Additionally, we are working on updating the Mixtures Specialty Section web page on the Society of Toxicology's site. We plan on using the web page as a means to publicize mixtures-related meetings and conferences. If you are involved in organizing the meeting, send us the information and we'll send out the information to the other members of the Specialty Section. Additionally, we would like to set up a section on the web page to publicize your mixtures-related

continued on page 2

SOT 2015 Reliving the Memories

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



MixSS activities started bright and early Sunday morning (March 22) with a Continuing Education Course offering titled "**Demystifying Mixtures: From Study Design Selection to Risk Assessment Application.**" This CE Basic course provided an overview of topics in mixtures toxicology and cumulative risk assessment. Speakers included MixSS past presidents Moiz Mumtaz (ATSDR) and Jane Ellen Simmons (US EPA), Cynthia Rider (NIEHS), Glenn Rice (US EPA), and Rick Hertzberg (Emory University). Over 130 participants attended the course. *If you are interested in developing a mixtures-related CE course for submission, please let the MixSS board know (cynthia.rider@nih.gov) – we are happy to share our experience and provide guidance.*

The MixSS Officer's meeting took place on Monday, March 23 at 6:30 am. Officers met over pancakes and coffee to discuss details of the MixSS reception, handing out awards, and general business. *If you would like to be more involved in your MixSS, please contact Bruce Fowler (drtox@earthlink.net) about running for office.*

continued on page 2

INSIDE THIS ISSUE

- 1 President's Message and SOT 2015 Review
- 3 MixSS 2015 Awards
- 5 Pictures and Officer Nominations
- 6 Past and Upcoming Events

continued from page 1

publications. If members of the Mixtures Specialty Section send us a link to your recent publications, we plan on posting links on the web site. This will allow other members of the Specialty Section to keep current with your latest efforts.

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

Sincerely,

David Herr

The first scientific session endorsed by **MixSS** along with Risk Assessment Specialty Section was a Workshop Session entitled “**Evaluating and Quantifying Stress for Inclusion in Cumulative Risk Assessment**,” chaired by Cynthia Rider (NIEHS) and Jane Ellen Simmons (US EPA). Focusing on vulnerable populations, this session provided multiple examples of nonchemical stressors in humans (e.g., chronic stress, social stress) and animal models, and recommendations for quantifying and incorporating these stressors into cumulative risk assessments. Speakers included Elena Craft (Environmental Defense Fund), Deborah Cory-Slechta (University of Rochester), Diane Miller (NIOSH), Jane Clougherty (University of Pittsburgh), and Amanda Evans (US EPA).

Always a highlight of the annual meeting, the **MixSS Reception** did not disappoint. In addition to the standard business updates and exciting announcements of award winners (see page 3), the reception also debuted **Mixtures Trivia**.



Nigel Walker (MixSS Councilor, NIEHS), expertly emceed a riveting game of trivia. Controversy abounded as groups answered a challenging set of (loosely) mixtures-related questions. The winning team took home Starbucks's gift cards.



The winning trivia team hard at work!

Another highlight of the reception was Meg's presentation of the appreciation plaque to Bruce Fowler for his service as MixSS President. Thank you, Bruce, for your significant contributions to the MixSS!



The Poster Session: Toxicity of Chemical Mixtures was on Tuesday, March 24th. The Mixtures Poster Session is a great time to find out the latest in mixtures research and meet potential collaborators. Many of the top 5 Mixtures Abstracts were present in this session (see page 3).

On Wednesday, March 25th, two MixSS endorsed sessions demonstrated the range of topics relevant to mixtures.

Along with the Mechanisms Specialty Section and the Molecular and Systems Biology Specialty Section, the MixSS endorsed a Symposium Session titled “**Role of the Gut Microbiome in the Host Response to Xenobiotics**.” The session, chaired by Andrew Patterson and Gary Perdew (both from Pennsylvania State University), covered interaction of the microbiome with POPs, Arsenic, AhR, drugs, and Metabolic Syndrome.

MixSS and Food Safety Specialty Section endorsed a Workshop Session on “**Evaluating Similarity across Related Complex Mixtures: The Challenge of Herbal Supplements**.” Chaired by Cynthia Rider (NIEHS) and Joe Betz (ODS), the session presented the latest science on comparing botanical dietary supplements to determine chemical and biological relatedness using examples like *Ginkgo biloba* extract, black cohosh, and Echinacea.

Finally, there was a Workshop Session endorsed by MixSS, Carcinogenesis Specialty Section and Risk Assessment Specialty Section titled “**The Carcinogenicity of Outdoor Air Pollution: A Review of the IARC Evaluation of Outdoor Air Pollution and Particulate Matter in Polluted Air as Group 1 (Known) Human Lung Carcinogens and Possible Bladder Carcinogens**.” This session covered evidence of mutagenicity and carcinogenicity of outdoor air pollution from epidemiology, animal studies, and biomarker evaluation) and was chaired by George Woodall (US EPA) and Paul White (University of Ottawa)

MixSS Awards

Graduate Student Award

Axelle Marchand (Université de Montréal)

Evaluation and Modeling of the Impact of Co-Exposures to VOC Mixtures on Urinary Biomarkers



A Wiley representative (right) presented the award to Axelle Marchand

Post doctoral Award

Melissa Badding, PhD (NIOSH)

Pro-inflammatory Responses and Inflammasome Activation by Sintered Indium-Tin Oxide Particles

Very Big Thanks to Wiley and to Meg Whittaker and ToxServices for supporting the MixSS awards!

Best Mixtures Abstract

(selected from the top 5 abstract pool)

Krystin Carlson (University of Michigan)

Assessment of Ototoxicity Due to Chronic Lead and Cadmium Exposure with and without Noise Exposure in CBA/J Mice



Melanie Eisele-Doyle presented the Top 5 ribbon to Krystin Carlson

Top 5 Abstracts

(in alphabetical order by first author)

Contact author: Krystin Carlson

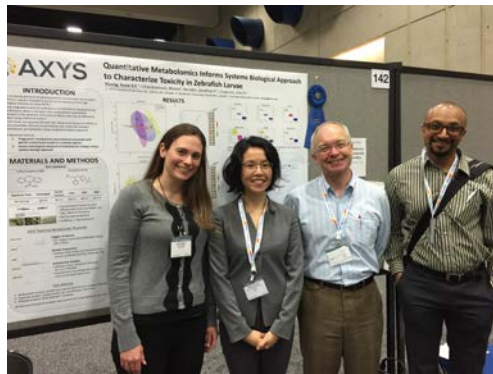
Title: Assessment of Ototoxicity Due to Chronic Lead and Cadmium Exposure with and without Noise Exposure in CBA/J Mice; Abstract #979

Contact author: Deborah Cory-Slechta

Title: Developmental Methylmercury Exposure Produces Behavioral Toxicity in Female Mice That Is Only Seen in Combination with Prenatal Stress in Male Mice

Contact author: Susie Huang

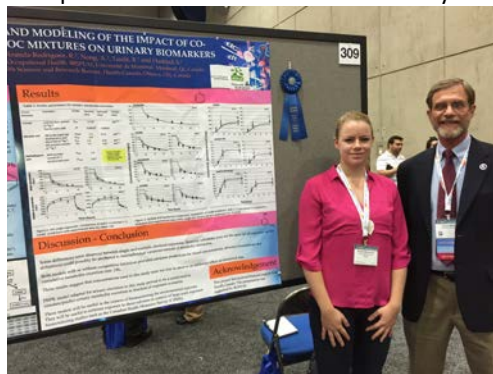
Title: Quantitative Metabolomics Informs a Systems Biological Approach to Characterize Toxicity in Zebrafish Larvae



Julia Rager (left) presented the award to Susie Huang and colleagues

Contact author: Axelle Marchand

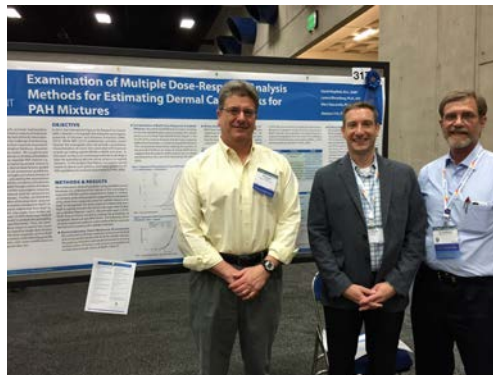
Title: Evaluation and Modeling of the Impact of Coexposures to VOC Mixtures on Urinary Biomarkers



David Mattie presented the ribbon to Axelle Marchand

Contact author: David Mayfield

Title: Examination of Multiple Dose-Response Analysis Methods for Estimating Dermal Cancer Risks for PAH Mixtures



David³: David Herr (left) and David Mattie presented the award to David Mayfield

continued from page 3

MixSS Reception



A packed crowd gathers to meet about mixtures



MixSS members and friends exploring the nutritional contribution to the totality of human exposures (i.e., exposome) – the ultimate mixture



David Herr and Earl Gray share EPA stories



Vickie Wilson (right) enjoying some time with lab members



2014-2015 MixSS Officers: David Herr, Nicole Kurhanewicz, Vickie Wilson, Meg Whittaker, Cynthia Rider, and Bruce Fowler (missing from picture: Melanie Eisele-Doyle and Ron Pringle)



Cynthia Rider, Jane Ellen Simmons, and Rick Hertzberg



Julia Rager (right) reunites with former labmates



Nigel Walker, Danielle Carlin, Rick Hertzberg, and Chris Gennings deeply contemplate mixtures



Melanie Eisele-Doyle and Jane Ellen Simmons bonding over mixtures

Trivia Challenge



Danielle Carlin and Chris Gennings take trivia very seriously



A team of experts



New mixtures recruits



How could this possibly go wrong?



Teamwork wins the day!

NOMINATE THE NEXT MixSS OFFICERS

Nominations are open for the positions of vice president-elect, councilor, post doctoral representative, and graduate student representative. Please consider nominating yourself or someone you think would be interested. Please contact **Bruce Fowler** (drtox@earthlink.net) with nominations.

A short (1 paragraph) biosketch with the nominee's qualifications/interests is all that is needed. The past president will lead a nominations committee that will submit the slate of candidates to SOT by December 31, 2015. Membership will then vote to elect the 2015-2016 MixSS officers.

In addition to participating in approximately 4-6 conference calls per year, officer duties include:

Vice President-Elect (1 year followed by transition to Vice President, President, and Past President – 4 years total)

- Administer Graduate Student/Post doc Award
- Present Student/Post doc Awards during MixSS reception
- Review and update by-laws

Junior Councilor (1 year followed by transition to Senior Councilor position – 2 years total)

- Work on increasing membership

Post doctoral Representative (1 year)

- Report MixSS-related events to PDA
- Provide postdoctoral perspective to MixSS activities

Graduate Student Representative (1 year)

- Report MixSS-related events to GSLC
- Provide student perspective to MixSS activities

Upcoming RASS/MixSS Webinars

December 9, 2015 (2 speakers)

The extensive toxicology data behind alternative short-chain fluorinated product technology

Robert C. Buck, Ph.D. (The Chemours Company)

PFAS and their non-fluorinated alternatives in “European Law and Industry” – current and future challenges

Stefan Posner (Swerea IVF)

January 13, 2016

Review of NIEHS Workshop on “Statistical Approaches for Assessing Health Effects of Environmental Chemical Mixtures in Epidemiology Studies”



Thomas Webster, D.Sc (Boston University School of Public Health)

Contact Kembra Howdeshell (MixSS Webinar coordinator) at kembra.howdeshell@nih.gov with suggestions for future webinars.

Upcoming Events

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

Date: April 26-27, 2016

Location: NIH, Bethesda, MD

Description: The safety of botanical dietary supplements is an important public health issue. Botanical dietary supplements are complex mixtures that pose several unique challenges to efficacy and toxicity evaluation related to their inherent complexity and a lack of consistency in nominally related products. The interrelated challenges associated with botanicals include: 1) developing methods and criteria for determining phytoequivalence of botanicals, 2) identifying the active constituent(s) or biological effect patterns of botanical products, and 3) relating the doses used in animal studies to human exposure levels. The workshop will engage multi-disciplinary experts to focus on practical approaches for addressing these challenges.

Past Events

Workshop: Statistical approaches to epidemiological studies of combined exposures/mixtures

Date: July 13-14, 2015

Location: NIEHS, Research Triangle Park, NC

For a summary of findings catch the upcoming RASS/MixSS Webinar on January 13, 2015 (see upcoming RASS/MixSS webinar, left)



Danielle Carlin (NIEHS) led the effort to organize and coordinate the workshop.



Russ Hauser (Harvard University) sets the stage for the workshop

The U.S. EPA hosted a Non-Targeted Analysis Workshop on August 18-19, 2015 at the Research Triangle Park Campus

The workshop brought together experts in non-targeted screening to discuss innovative methods and best practices for collecting, analyzing, interpreting, storing, and exchanging measurement data related to xenobiotic chemical exposures. Stay tuned for results from the workshop.

<https://sites.google.com/site/nontargetedanalysisworkshop/home>