

# Mixtures Specialty Section Newsletter

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March 2017

## President's Message

Meg Whittaker, PhD  
MixSS President  
ToxServices



Dear Mixtures Specialty Section Members,

I would like to congratulate and welcome the new Mixtures Specialty Section officers (who are profiled later in the newsletter). Each brings to the table wonderful expertise in mixtures toxicology, which should spill over into exciting and interesting MixSS events in 2017.

The state of mixtures toxicology and risk assessment methods is indeed undergoing advancement. As detailed in the recent NAS report titled "Using 21<sup>st</sup> Century Science to Improve Risk-Related Evaluations" (<https://www.nap.edu/catalog/24635/using-21st-century-science-to-improve-risk-related-evaluations>), mixtures toxicity is an integral part of Tox21, and is front and center as part of Tox21's Phase III testing. We each need to consider how predictive toxicology can be incorporated into our own research and be active participants in moving predictive toxicology into our own practices.

I would like to thank you for the opportunity to serve as your President over the past year. I am honored to be a member of SOT and have appreciated the opportunity to have advanced the interests of mixtures toxicology.

Sincerely,  
Meg

## Your Research in 3 min

### Three Minute Mixtures Science Talk

**Competition...**Because squeezing your research into 12 pages isn't bad enough!

Join us for Three Minute Science Talks at the MixSS Reception, Wednesday, March 15<sup>th</sup> 6:00-7:30 pm. Competitors will each have a "strict" **3 minutes** to sum up their life's work, or at least a key piece of a current mixtures-related research project.

**No slides; No notes; No props!**

Contestants will be judged for how clearly they can present their ideas in an *entertaining* and *engaging* manner to a non-specialist audience. Winners will be selected by audience members, so bring your friends.

### There will be PRIZES!!!

We have a maximum of 10 contestant slots and are especially encouraging postdocs and grad students, though "seasoned" scientists may still participate. To sign up send an email to Justin Conley ([conley.justin@epa.gov](mailto:conley.justin@epa.gov)) with a catchy title.



## INSIDE THIS ISSUE

- 1 President's Message and 3 Min Mix
- 2 SOT 2017
- 4 RASS-MixSS Webinars and New Officers
- 6 Thank yous and Upcoming events

# 2017 SOT Annual Meeting

## Your Guide to Mixtures Programming

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



Sunday, March 12

**Continuing Education Course AM02** Adding Up Chemicals: Component-Based Risk Assessment of Chemical Mixtures

**Chairs:** Jane Ellen Simmons (US EPA) and Richard C. Hertzberg (Biomathematics Consulting)

**When:** 8:15 am – 12 noon

**Where:** CC Levels 300 and 400 (check signage)

**Synopsis:** Component-based methods, while least preferred, are most frequently used to conduct mixtures risk assessments (RA), needing only toxicological information on the individual chemicals or pairs. Inherent in component-based methods are assumptions regarding: toxicological similarity (e.g., dose addition) or independent action; the likelihood or relevance of nonadditive interactions; and the appropriate combined action model. This course covers underlying concepts, inherent assumptions, and uncertainties for mixture assessments.

**Speakers:** Jane Ellen Simmons (US EPA), Christopher J. Borgert (Applied Pharmacology and Toxicology, Inc), Richard C. Hertzberg (Biomathematics Consulting), and Steven L. Levine (Monsanto Company).

Registration information at:

<http://www.toxicology.org/events/am/AM2017/program.asp#CE>

**Registration for CE courses still available on-site!**

Monday, March 13

Although the officers' meeting is generally a closed meeting, MixSS members are invited to provide their input and suggestions to officers prior to the meeting ([cynthia.rider@nih.gov](mailto:cynthia.rider@nih.gov)).

**When:** 7:00 – 8:00 am

**Poster Session:** Mixtures

**When:** 9:30 am – 12:45 pm

**Where:** Exhibit Hall

**Abstract Numbers:** 1114-1130

**Poster Board Numbers:** P151-P167

**Workshop Session:** Improving Public Health through Innovations in Exposure Science

**Session chairs:** Cecilia Tan (US EPA) and Alicia Paini (Joint Research Centre)

**Speakers:** A. Paini (Joint Research Centre), J. Rager (ToxStrategies), M. Arora (Icahn School of Medicine at Mount Sinai), E. Seto (University of Washington), J. Teeguarden (Pacific Northwest National Laboratory), S. Edwards (US EPA)

**When:** 2:00 – 4:45 pm

**Where:** CC Ballroom III

Tuesday, March 14

**Poster Session:** Metals III: Various Metals and Mixtures

**When:** 1:15 – 4:30 pm

**Where:** Exhibit Hall

**Abstract Numbers:** 2108-2136

**Poster Board Numbers:** P326-P354

Wednesday, March 15

**Workshop Session:** Measurement and Prediction of Chemicals in Consumer Products

**Session chairs:** John Wambaugh (US EPA) and Kristin Isaacs (US EPA)

**Speakers:** J. Wambaugh (US EPA), D. Bennett (University of California, Davis), C. O'Mahony (Creme Global), K. Isaacs (US EPA), T. Thomas (US Consumer Product Safety Commission)

**When:** 9:30 am – 12:15 pm

**Where:** CC Room 316

**Roundtable Session:** Herbo-Metallic Mixtures in Traditional Medicines

**Session chairs:** J. Christopher States (University of Louisville) and Jie Jerry Liu (Zunyi Medical College)

**Speakers:** J. States (University of Louisville), C.V. Rider (NIEHS), M.G. Soni (Soni & Associates), L. Wei (Chinese Academy of Sciences), J. Liu (Zunyi Medical College)

**When:** 12:30 – 1:50 pm

**Where:** CC Room 309

**Historical Highlights Session:** NIEHS Superfund Research Program: A History of Cutting-Edge Science and Innovative Technologies

**Session chairs:** Danielle Carlin (NIEHS) and Rebecca Fry (University of North Carolina-Chapel Hill)

**Speakers:** W. Suk (NIEHS), R. Fry (University of North Carolina-Chapel Hill), R. Tanguay (Oregon State University), S. Comier (University of Tennessee Health Sciences Center), B. Hennig (University of Kentucky)

**When:** 12:30 – 1:50 pm

**Where:** CC Room 310

Please join us for the MixSS reception! Catch up with old friends and make new ones over hors d'oeuvres, business updates, MixSS awards. This year the MixSS will feature the **3 Minute Science Talk Challenge** (see page 1 for details)! You do not have to be a member to join us, so feel free to bring a friend to the reception.

**MixSS Meeting/Reception**

**When:** Wednesday, March 15, 6:00 – 7:30 pm

**Where:** Hilton Baltimore, Key Ballroom 9

Thursday, March 16

**Symposium Session:** Evaluating the Reproductive and Developmental Effects of Botanical Dietary Supplements

**Session chairs:** Kembra L. Howdeshell (NIEHS) and Cynthia V. Rider (NIEHS)

**Speakers:** J. Bolton (University of Illinois), M. Hixon (Gradient), N. Catlin (NIEHS), C. Gryniwicz-Ruzicka (US FDA), K. VanderMolen (New Chapter Inc./The Procter & Gamble Company)

**When:** 8:30 – 11:15 am

**Where:** CC Ballroom I

## Call for 2018 Session Proposals

**Your ideas are golden, please share them! Submit a mixtures session for the SOT 2018 meeting.**

Developing a scientific session is a great way to highlight the mixtures topics that interest you. The SOT provides clear guidelines to help you develop a successful session at:

[https://www.toxicology.org/events/am/AM2018/proposal\\_guidelines.asp](https://www.toxicology.org/events/am/AM2018/proposal_guidelines.asp).

### Steps include:

1. Choose a session type (Continuing Education, Symposia, Workshop, Historical Highlight, Roundtable, Informational, Regional Interest, Education-Career Development) – Specifics and examples are available on the website.
2. Write Abstracts and Confirm Presenters
3. Secure Endorsements from Regional Chapters, Special Interest Groups and Specialty Sections – Start this process early to get feedback from endorsers.
4. Submit your proposal.

### In evaluating proposals, the MixSS looks for:

- **Topics that advance the science of mixtures.** Although we appreciate sessions that address mixtures as entities (e.g., *Health Effects of Traffic Pollution*), we absolutely love sessions that help us gain a fundamental understanding of mixtures. For example, *Identifying the Key Constituents in a Traffic Pollution Mixture Driving Health Effects*, *Comparing Toxicity Across Mixtures from Different Sources*, or *Cumulative Risk of Traffic Pollution and Chronic Stress*.
- **A balanced perspective.** Having representatives from government, industry, and academia helps!
- **A great story.** Clarity, flow, and integration across speakers are key to communicating a complete story.

Proposals are due to SOT headquarters by **May 15<sup>th</sup>, 2017**. In order to allow for feedback from the Mixtures Specialty Section, submissions should be provided to Cynthia Rider ([cynthia.rider@nih.gov](mailto:cynthia.rider@nih.gov)) by **May 1<sup>st</sup>, 2017**. Please contact us with questions, we are happy to help with session development!

## Joint RASS-MixSS Webinars

Kembra Howdeshell, PhD  
MixSS Webinar Coordinator  
NIEHS/DNTP

The Mixtures Specialty Section organized speakers for two joint Risk Assessment Specialty Section (RASS)-Mixtures Specialty Section (MixSS) webinars in the 2016-2017 RASS webinar series. We began the series with a presentation by Dr. Jane Clougherty of University of Pittsburgh on “Incorporating non-chemical stressors into cumulative risk assessment” on September 14, 2016. Dr. Clougherty described the current state of the knowledge on combined effects of pollutants and psychosocial stressors on health. She also reviewed new methods for quantifying, and accounting for, potential confounding and effect modification by non-chemical stressors in environmental and occupational cumulative risk assessments.

The second joint RASS-MixSS webinar was presented by Dr. Marike Kolossa-Gehring of the German Environmental Agency on “German Environmental Survey and Specimen Bank and The Use of Human Biomonitoring Data for Risk Assessment” on January 11, 2017. Dr. Kolossa described two of her agency’s efforts to quantify human exposure to support health risk assessment: the German Environmental Survey (GES) and the Environmental Specimen Bank (ESB). The GerES is a population-based study that includes human biomonitoring and information on exposure pathways and living conditions. The ESB is a permanent monitoring study following trends of pollutants in humans and the environment. This presentation described the GerES and ESB, and demonstrated how the data are being used to develop and assess human health risk assessment of individual and mixtures of chemicals, and policy measures in Europe with the European Human Biomonitoring Initiative (a European Union effort).

We are collecting suggestions for next year’s joint RASS-MixSS webinars. Please bring your ideas to the MixSS reception at the 2017 Annual Meeting of SOT on Wednesday, March 15th 6:00-7:30 pm. Alternatively, you can email your speaker suggestions to Kembra Howdeshell at [howdeshellkl@niehs.nih.gov](mailto:howdeshellkl@niehs.nih.gov) by May 1, 2017.

The presentation file and recordings of these two webinars are posted on the MixSS website under downloads:

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

## New MixSS Officers



### Vice President-Elect: Danielle Carlin, PhD, DABT

Dr. Carlin is a Health Scientist Administrator (i.e., Program Administrator) at the National Institute of Environmental Health Sciences (NIEHS) in the Division of Extramural Research and Training and the Superfund Research Program. In her position, she provides guidance and advice to grantees applying for SRP P42 Center grants, and serving as the lead liaison between SRP trainees and the various training opportunities offered by SRP. She also oversees the mixtures toxicology, xenobiotic metabolism, and asbestos grant portfolios (e.g., R01s). Dr. Carlin has organized a number of scientific sessions around the topic of mixtures at both national and international meetings and two mixtures-related workshops: “Advancing Research on Mixtures: New Perspectives and Approaches for Predicting Adverse Human Health Effects” in 2011 and “Statistical Approaches for Assessing Health Effects of Environmental Chemical Mixtures in Epidemiology Studies” in 2015. She has been a member of the SOT since 2008. She has also served as Councilor (2013-2015) for the North Carolina Chapter of the Society of Toxicology (NCSOT) and is currently the President of NCSOT (2016-2017). Prior to her current position, she was a post-doctoral researcher at the University of North Carolina. Her areas of expertise include cardiopulmonary/reproductive physiology and inhalation toxicology/pharmacology. She received her Ph.D. in 2005 from Kansas State University, College of Veterinary Medicine, Department of Anatomy and Physiology.





**Secretary and  
Treasurer:  
Emily Madden,  
PhD, DABT**

Dr. Emily Madden is a toxicologist with over 15 years of diverse experience in the dietary supplement and pharmaceutical industries. Prior to working at ToxServices, Dr. Madden served as the company toxicologist for a dietary supplement manufacturer and her experience includes assessing the safety of dietary supplements, food ingredients, personal care products and essential oils and investigating serious adverse events. In this position, she has also written comprehensive safety evaluations for dietary ingredients in self-affirmed Generally Recognized as Safe (GRAS) reports and developed SOPs for evaluating product safety and investigating adverse events. In addition, Dr. Madden was a study director for a contract research organization and has directed preclinical toxicology studies for submission to regulatory agencies. Dr. Madden earned a Ph.D. in Toxicology from The University of Maryland, Baltimore. She studied the effects metal mixtures on kidney cells in vitro for her graduate dissertation. Dr. Madden was a Post-Doctoral Research Fellow at the Center for Devices and Radiological Health of the U.S. Food and Drug Administration where she investigated rodent models of subclinical kidney injury for use in the safety assessment of medical device materials.



**Councilor:  
Bethany Hannas,  
PhD**

Dr. Hannas is a Senior Toxicologist at The Dow Chemical Company, where she serves as a subject

matter expert in the area of developmental and reproductive toxicology. In this role, Dr. Hannas acts as lead scientist on guideline DART studies in support of a wide portfolio of compounds and heads investigational research in the area of endocrine disruption and incorporating metabolism into in vitro predictive assays. She received her doctorate in Toxicology from North Carolina State University in 2009 and was a postdoctoral fellow at the U.S. Environmental Protection Agency from 2009-2013. She has been a member of SOT since 2006 and has served as a Peer Mentor for the Undergraduate Education Program (2011-2012), Councilor of the Postdoctoral Assembly Board (2012-2013), and most recently as New Career Councilor for the Reproductive and Developmental Toxicology Specialty Section (RDTSS). Dr. Hannas is currently a member of the RDTSS and the Women in Toxicology Special Interest Group.



**Graduate Student  
Representative:  
Elizabeth Martin**

Elizabeth Martin is a PhD candidate at The University of North Carolina at Chapel Hill (UNC-CH). She received her bachelors of public health in Environmental health from (UNC-CH) in 2013. Elizabeth has authored/co-authored 12 publications. She has been a member of SOT since 2016. Her research focuses on health effects associated with toxic metals and using human metabolomic profiles to elucidate how arsenic induces diabetes. She is also interested in understanding the effects of prenatal exposure to toxic metals on the epigenome. She has published on the transcription factor occupancy theory in relationship to environmental metals. Additionally, she is interested in epigenetic contributions to reproductive diseases, such as the role of TGF-beta methylation and expression in preeclampsia. In the future she hopes to continue working on reproductive and prenatal toxicology but expanding her work to include mixtures. To this end she partnered with Ilona Jasper's lab to analyze gene expression changes resulting from cigarette use, comparing e-cig users to traditional tobacco smokers.

## Big thanks to our outgoing officers!

David Herr (Past President) has been an invaluable member of the team! We are sad that his term is ending, but know that he will stay involved in the MixSS (right, Dave?).



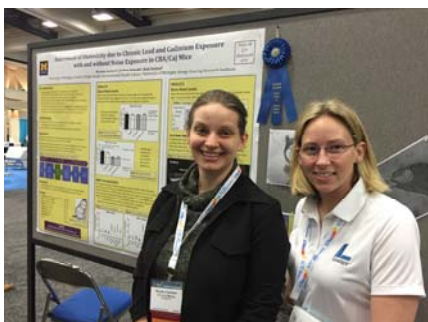
Flashback to 2011 with Dave and Danielle

Nigel Walker (Councilor) has taken his job as Official MixSS Reception Emcee just as seriously as his job as Councilor. Luckily, the Emcee job will be extended indefinitely! Thank you so much for your service as Councilor, Nigel!



Nigel at SOT 2015

Krystin Carlson has been an exemplary Graduate Student Representative – always willing to lend a hand and full of great ideas. Thank you, Krystin!



Krystin and Melanie at SOT 2015

Join the MixSS Team!

To run for office, contact President Meg Whittaker (Mwhittaker@toxservices.com). Open positions for the 2018-2019 term include Councilor, Post doctoral Representative and Graduate Student Representative.

## Upcoming Events

### Conference: 2nd International Fresenius MIXTOX Conference "Toxicity of Chemical Mixtures: Risk, Hazard and Exposure Assessment"

**Dates:** June 8-9, 2017

**Location:** Cologne, Germany

**Website:** <https://www.akademie-fresenius.de/veranstaltungen/detail/produkt/2nd-international-fresenius-mixtox-conference-toxicity-of-chemical-mixtures-risk-hazard-and-expos/>

#### From the website:

#### Highlights

##### EU Guidance

- Risk management: Cumulative risk assessment for dietary risk assessment of pesticides (DG SANCO)
- European Commission's (DG ENV) perspective on mixture toxicity
- The European Commission's Joint Research Centre on mixture toxicity

#### Latest from regulators and industry

- Cumulative risk assessment of regulated substances – dietary exposure and nondietary exposure
- Cumulative risk assessment of pesticides for operator and worker risk assessment
- Environmental risk assessment and mixture toxicity for biocides and pesticides
- ECHA's current activities regarding mixture toxicity for REACH chemicals and biocides
- EFSA's vision of harmonisation of ERA and human toxicology

#### Testing approaches and international research projects

- Update on the EuroMix project
- The WHO Framework: Implications for combined exposures assessment
- Update on EDC-MixRisk project
- A perspective on cumulative risk assessment that is protective of human health yet resource-efficient