Mixtures Specialty Section Newsletter

Volume 8, Issue 1 **October 2017**

President's Message

Cynthia Rider, PhD
MixSS President
NIEHS/NTP

Dear Members,

Let's bring mixtures research into the spotlight in 2018! One important way you can help us do that is to get more involved in your Specialty Section.

There are so many ways to be active:

- Become a MixSS Officer
- Nominate your graduate student or postdoctoral trainee for a MixSS award
- Suggest a webinar speaker for the RASS/MixSS series
- Submit mixtures-related program sessions for annual SOT meetings
- Attend the MixSS Reception
- Contribute to the Newsletter
- Develop a Contemporary Concepts in Toxicology (CCT) Mixtures Workshop
- Tell us about your mixtures-related events

Our goal is to be a resource for the mixtures research community: a place to find out about mixtures-related science and events. To be that resource, we need your help. We need to understand how you currently engage with the MixSS and what we can do to increase that level of engagement.

On a personal note, I have been active in the MixSS since I served as the Postdoctoral Representative in 2009. The people I was fortunate enough to serve with made a huge impression on me. People like our third MixSS President, Jane Ellen Simmons, who I continue to collaborate with to this day (stay tuned for the announcement of a mixtures book we are co-editing). Moiz Mumtaz, Janice Chambers, Kannan

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SOT 2017 in Review Baltimore, MD

The SOT 56th Annual Meeting and ToxExpo was held March 12-16th in Baltimore, Maryland. Memorably, it involved some trekking through snow to get from the hotels to the Convention Center (photo evidence provided above)! We were fortunate to have plenty of mixtures-related programming throughout the meeting.

The CE Course, Adding Up Chemicals: Component-Based Risk Assessment of Chemical Mixtures, kicked off the meeting on Sunday, March 12th. This highly attended course was recorded and is available through CEd-Tox: SOT Continuing Education Courses Online at (free to postdoc and student members): http://www.toxicology.org/education/ce/onlineCourses.asp

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Inside This Issue

Krishnan, Michael Dourson, David Mattie, Meg Whittaker, David Herr, Sami Haddad, Ken Sexton, Bruce Fowler, Ken Wallace, Paul Price, Julia Rager, Axelle Marchand, and Krystin Carlson…are all people that I am incredibly thankful to have had the pleasure of meeting and getting to know *through* serving in the MixSS. I maintain that mixtures researchers are the nicest people!

Now, whenever I have the opportunity to mentor a trainee, I strongly suggest that they become engaged in their Specialty Section. It is truly an excellent avenue for becoming an active member of your scientific community.

As we look forward to meeting again in 2018, I hope that you will consider adding your name to the list of people that have shaped the MixSS and continue to make it a great community!

Sincerely,

Cynthia Rider

The CE course, chaired by Jane Ellen Simmons (EPA) and Rick Hertzberg (Biomathematics Consulting), included discussion of how to decide which chemicals to include in cumulative risk assessment, design considerations, different models of additivity, and a case study.

Monday also brought the Mixtures Poster Session. Attending the Mixtures Poster Session is one of the best ways to catch up with colleagues and peruse the latest mixtures science. A breadth of topics was on display, including: biomonitoring to identify common mixtures, predictive modeling of mixture effects, and identifying interactions among estrogenic chemical mixtures.

The workshop session on Monday afternoon, "Improving Public Health through Innovations in Exposure Science" was chaired by Cecilia Tan (EPA) and Alicia Paini (Joint Research Centre) and focused on new tools for characterizing exposure to mixtures. The tools included non-targeted methods, laser ablation for reconstructing early-life exposures from baby teeth, low-cost air sensors for measuring personal exposure, and biomonitoring to assess the potential effects of estrogens in pregnant women.

Another workshop session addressing exposure and mixtures, titled "Measurement and Prediction of Chemicals in Consumer Products," took place on Wednesday, March 15th. This session, chaired by John Wambaugh (EPA) and Kristin Isaacs (EPA), focused on improving our understanding of exposures from consumer products and how to incorporate this information into evaluations of risk.

Wednesday afternoon brought two completely different perspectives on mixtures with a roundtable discussion of "Herbo-Metallic Mixtures in Traditional Medicines" and a historical highlights session on Research in the Superfund Program. Speakers in the roundtable session discussed the use of herbs and metals in traditional medicine practices from China, India, and Tibet. The historical highlights session, titled "NIEHS Superfund Research Program: A History of Cutting-Edge Science and Innovative Technologies," drew attention to excellent work of Superfund grantees addressing numerous types of mixtures (e.g., metals, polycyclic aromatic hydrocarbon mixtures, emerging contaminants, and nutritional exposures).

The MixSS reception took place on Wednesday night. As in years past, the reception offered a wonderful opportunity to meet up with fellow mixtures researchers and present awards to trainees for their excellent science (see page 4). New in 2017 was the 3-Minute Research Challenge. Reception attendees were encouraged to try their skill at giving a 3-minute elevator pitch of their research. Many accepted the challenge, some walked away with prizes, all were entertained!

Finally, a Thursday morning symposium titled "Evaluating the Reproductive and Developmental Effects of Botanical Dietary Supplements" closed out the meeting. In this session, chaired by Kembra Howdeshell (NIEHS/NTP) and Cynthia Rider (NIEHS/NTP), speakers discussed complex mixtures in the form of botanicals and related dietary supplements. Topics included use of black cohosh and red clover in menopause, evaluation of caffeine in energy shots for reproductive effects, developmental toxicity of vinpocetine, adulteration of male enhancement products with pharmaceuticals, and testing approaches to assess safety of dietary supplements.

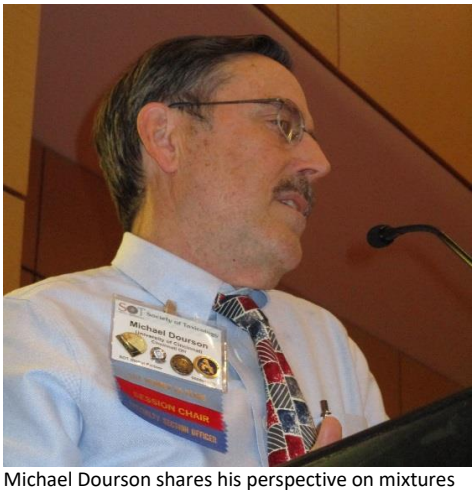
Mixture Pictures from SOT 2017

A packed house at the MixSS Reception!

The 3-Minute Research Talks in Action…

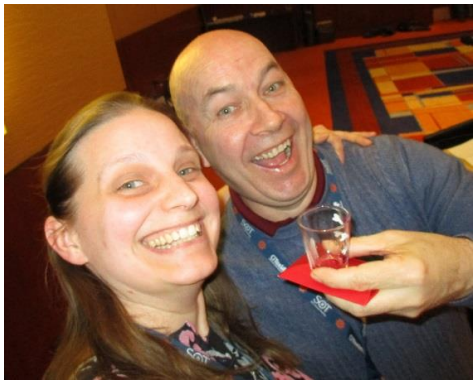
Elizabeth Martin tells us about epigenetics

Krystin Carlson describes her work with noise and metals



Michael Dourson shares his perspective on mixtures

Mike DeVito takes home a prize



Krystin and Nigel Walker celebrate her win with a selfie!

Your new MixSS officers…

Justin Conley, Emily Madden, Danielle Carlin, and Elizabeth Martin

Cynthia Rider (left) presents a plaque to Meg Whittaker (right) for her excellent service as President of the MixSS 2016-2017!

MixSS Awards

Graduate Student Award

Changquing Zhou (University of Illinois)

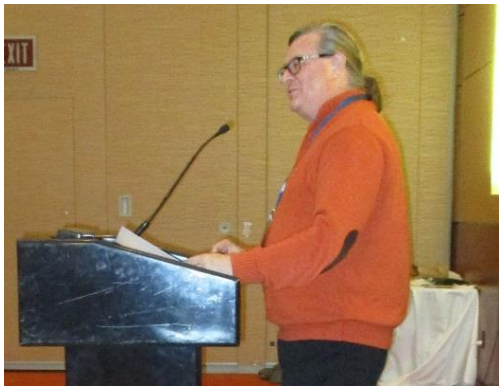
Prenatal Phthalate Mixture Exposure Adversely Affects Female Reproduction in Mice

Postdoctoral Award

Justin Conley, PhD (US EPA)

A Mixture of 18 Anti-Androgens at Concentrations Below Individual Chemical Effect Levels Produces Reproductive Tract Malformations in the Male Rat

Thanks to Wiley for continued support of MixSS awards to trainees!



Professor Warren G. Foster of McMaster University presented the Wiley Certificates to winners of the trainee awards

Best Mixtures Abstract Award

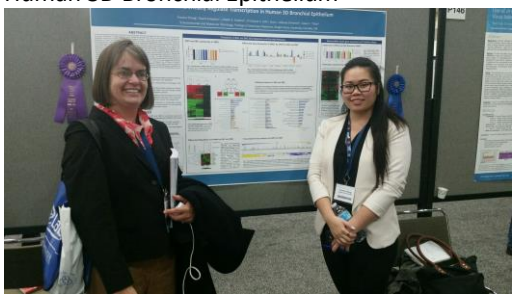
Yvonne Chang, PhD (Oregon State University)

PAHs Differentially Regulate Transcription in Human 3D Bronchial Epithelium

Top 5 abstracts

(listed alphabetically by first author below)

Yvonne Chang - PAHs Differentially Regulate Transcription in Human 3D Bronchial Epithelium



Justin Conley - A Mixture of 18 Anti-Androgens at Concentrations below Individual Chemical Effect Levels Produces Reproductive Tract Malformations in the Male Rat

Kristian Dreij - Development and Application of In Vitro-Based Mixture Potency Factors for Improving Health Risk Assessment of Airborne PAHs

Katherine Harvey - Neurochemical and Behavioral Consequences of Developmental Exposure to Low Dose EDCs and Their Mixture

Jeanette Reyes - An analysis of Cumulative Risks Indicated by Biomonitoring Data of Six Phthalates Using the Maximum Cumulative Ratio

RASS/MixSS Webinar

Kembra Howdeshell, PhD
MixSS Webinar Coordinator
NIEHS/NTP

The 2017-2018 SOT Risk Assessment Webinar (RASS) Series began with a joint webinar with the Mixtures Specialty Section on September 13, 2017. The webinar featured presentations by doctoral candidate Krystin Carlson on "*Mixing Hazardous Agents in a Mouse Model: Noise with Lead and Cadmium,"* and postdoctoral trainee Dr. Justin Conley on *"Complex Mixtures of Anti-androgens at Concentrations Below Individual Chemical Effect Levels Produce Reproductive Tract Malformations in the Male Rat."* The presentations were well-attended with good discussion following. A PDF and audio recording of Ms. Carlson's and Dr. Conley's presentations are available on the RASS website at https://www.toxicology.org/groups/ss/RASS/downloads.asp.

The next joint SOT RASS-MixSS webinar is scheduled for January 10, 2018 at 3 pm, and the invited speakers are MixSS members Moiz Mumtaz (ATSDR/CDC) and Peter McClure (Syracuse Research Corporation). They will be presenting on the Agency for Toxic Substances and Disease Registry's (ATSDR) 2017 update of Guidance Manual for Assessing Health Impact of Multiple Chemicals and Other Stressors.

The Executive Committee appreciates your continued interest in this SOT webinar series. Please submit speaker suggestions for future joint RASS-MixSS webinar series to Kembra Howdeshell (howdeshellkl@niehs.nih.gov) or any Executive Committee member.

Elizabeth Martin (UNC) Receives the Karen Wetterhahn Memorial Award

Congratulations to our 2017-2018 MixSS Graduate Student Representative, Elizabeth Martin, for receiving the prestigious Karen Wetterhahn Memorial Award at the December Superfund Research Program meeting in Durham, NC.

Elizabeth is the 19th recipient of this annual award that recognizes one outstanding graduate student or postdoctoral researcher in the Superfund Research Program.

She is currently a PhD candidate in the UNC laboratory of Dr. Rebecca Fry. Elizabeth's work focuses on the epigenetic mechanisms associated with negative health effects from exposure to metals. She is also interested in population differences in response to metal exposures. In addition to her research, she has been involved in scientific communication and outreach activities.

To learn more about Elizabeth's work in this area, see her recent publication:

Martin EM, Fry RC. 2016. A cross-study analysis of prenatal exposures to environmental contaminants and the epigenome: support for stress-responsive transcription factor occupancy as a mediator of gene-specific CpG methylation patterning. Environ Epigenet 2(1).

MixSS Graduate Student and Postdoctoral Fellow Awards

We want to recognize your mixtures research! Win a cash award (plus a wonderful plaque) for your work.

Who is eligible? Students or postdoctoral scholars who are first authors on SOT 2018 accepted abstracts in the field of mixtures.

How do I apply? Send the following to Vice President-Elect, Danielle Carlin (danielle.carlin@nih.gov):
1) an electronic copy of the accepted abstract
2) a synopsis not to exceed three pages of the work on mixtures covered in the abstract. The synopsis can contain figures, tables and/or text
3) a letter from your major advisor confirming that you are a trainee (graduate student or postdoc) in good standing at the time of abstract submission

When can I apply? Any time before the deadline of January 31, 2018.

NOMINATE THE NEXT MIXSS OFFICERS

Help shape the future of the MixSS by becoming an Officer. Your small commitment goes a long way! Officer activities include a couple of conference calls throughout the year and review of award submissions and mixtures-related session proposals.

Serving as a MixSS Officer is a great way to get to know fellow mixtures enthusiasts and learn about the latest mixtures research.

Nominations are open for the positions of Vice President-Elect, Councilor, Postdoctoral Representative, and Graduate Student Representative. Please consider nominating yourself or someone you think would be interested. Please contact **Meg Whittaker** (Mwhittaker@toxservices.com) 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, 2017. Membership will then vote to elect the 2017-2018 MixSS officers.

Upcoming Events & Notices

Are you doing research on understudied chemicals within environmental/biological mixtures?

Check out the U.S. EPA's Chemistry Dashboard for data on exposure and toxicity associated with thousands upon thousands of chemicals. Information includes physiochemical properties/predictions, chemical product and use categories, monitoring data, high-throughput exposure predictions (i.e. ExpoCast), and high-throughput screening for chemical toxicity (i.e. ToxCast/Tox21). Available at: https://comptox.epa.gov/dashboard/.

Workshop: Understanding the Combined Effects of Environmental Chemical and Non-Chemical Stressors: Atherosclerosis as a Model

Date: April 3-4, 2018

Location: NIEHS Campus, RTP, NC

Description from the website:

The NIEHS Division of Extramural Research and Training (DERT) and the NHLBI Division of Cardiovascular Sciences (DCVS) are seeking input for identification of key biological mechanisms/pathways of the combined effects of chemical and non-chemical stressors associated with atherosclerosis. Information provided will be used in planning a workshop which will take place on April 3 & 4, 2018 at the NIEHS Main Campus to help inform the development of intramural and extramural research efforts that address the combined health effects of environmental chemical and non-chemical stressors associated with atherosclerosis, a known multi-factorial disease. Input from all interested parties is welcome including the lay public, environmental health researchers, health professionals, educators, policy makers, industry, and others.

Check the website for updates:
https://partners.niehs.nih.gov/atherosclerosis/index.htm