

Mixtures Specialty Section Newsletter

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President's Message

Bruce Fowler, PhD, ATS
MixSS President
Emory University School of Public Health and the
University of Alaska, Fairbanks



The Annual Meeting of SOT will be held in San Diego later this month and I encourage everyone to attend and actively participate. I look forward to greeting as many of you as possible at our MixSS reception. We have an active and growing Specialty Section which brings great energy and focus to a central issue in toxicology—namely that chemicals or pharmaceutical exposures most often occur on a multi-agent basis. This fact clearly complicates accurate public health risk assessments. The good news is that we have ever improving tools such as computational modeling, high-throughput test systems, and an increasing understanding of how chemical agents interact with essential molecular pathways on an individual or mixture basis. I hence believe that there is reason for great optimism for the future of mixtures research through the application of the tools of modern science.

In addition, I wish to offer my encouragement to students, postdoctoral fellows and new investigators in toxicological sciences. You are the future of toxicology and mixtures research in particular. The tasks ahead are difficult and complex but you have wonderful new tools. If you apply your modern toxicology training, I believe the odds are in your favor. You will have a chance to make an important contribution to the global public

Mixtures at the SOT 2015 Annual Meeting

Cynthia Rider, PhD, DABT
MixSS Secretary/Treasurer
NIEHS/DNTP



Mixtures sessions are plentiful throughout the SOT 2015 meeting. Find the details of mixtures-related sessions and activities below.

Sunday, March 22

Continuing Education Course: An Introduction to the Exposome

Chairs: Gary Miller (Emory University) and Martyn Smith (UC Berkeley)

When: 8:15 am – 12 noon

Where: CC Room 7

Synopsis: The course will introduce the attendees to the concept of the exposome, explain how it can be used to advance toxicological research by providing a clear translational output, and explain some of the

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health of future generations. Consider the question of how important is that?

Finally, I wish to thank all students and postdoctoral fellows who applied for the MixSS Awards. We also owe special thanks to Wiley and ToxServices LLC for sponsoring these awards and judges who reviewed the abstracts. Many thanks to all of you for your support and enthusiasm in encouraging these fine young scientists at an early stage in their careers.

I wish you all safe travels to and from San Diego and look forward to meeting you at our reception.

Best regards to all,

Bruce A. Fowler

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innovative approaches being used to measure the exposome.

Speakers: G.W. Miller (Emory University), J.F. Wambaugh (US EPA), M.T. Smith (UC Berkeley), and C. Patel (Harvard Medical School)

Continuing Education Course: Demystifying Mixtures: From Study Design Selection to Risk Assessment Application

Chairs: Jane Ellen Simmons (US EPA) and Cynthia Rider (NIEHS)

When: 8:15 am – 12 noon

Where: CC Ballroom 6C

Synopsis: Key principles and concepts underlying modern mixtures toxicology, risk assessment (RA), legislation, policy, and guidance in the United States and other nations will be reviewed. Guidance based on data quality will be provided for application of either whole mixture or component-based RA approaches. Whole mixture RA discussions will include recent research on methods to determine whether mixtures are sufficiently similar such that toxicity information for one mixture can be used to estimate the toxicity of another.

Speakers: M. Mumtaz (ATSDR), C.V. Rider (NIEHS), J.E. Simmons (US EPA), G. Rice (US EPA), R. Hertzberg (Emory University)

Registration for CE courses still available on-site!

Monday, March 23

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).

When: 6:30 – 7:30 am

Where: Richard Walker's Pancake House (520 Front St., San Diego, CA 92101)

Workshop Session: Evaluating and Quantifying Stress for Inclusion in Cumulative Risk

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

Speakers: E.S. Craft (Environmental Defense Fund), D.A. Slechta (University of Rochester), D.B. Miller (CDC-NIOSH), J.E. Clougherty (University of Pittsburgh), A.M. Evans (ORISE/US EPA)

When: 2:00 – 4:45 pm

Where: CC Ballroom 6E

Please join us for the MixSS reception!

Get to know your MixSS community at this fun, annual event. Socialize with other mixtures-minded people while enjoying hors d'oeuvres, hearing updates about MixSS business, clapping for MixSS award winners, and for the first time ever, anywhere playing...**MIXTURES TRIVIA!** Test your mixtures knowledge as you compete for the opportunity to become the reigning mixtures champion. 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: Monday, March 23, 6:00 pm – 7:30 pm

Where: CC Room 30E

Tuesday, March 24

Poster Session: Toxicity of Chemical Mixtures

When: 1:00 – 4:30 pm

Where: Exhibit Hall

Abstract Numbers: 1368-1391

Poster Board Numbers: 301-324

Wednesday, March 25

Symposium Session: Role of the Gut Microbiome in the Host Response to Xenobiotics

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Session chairs: Andrew Patterson (Pennsylvania State University) and Gary Perdew (Pennsylvania State University)

Speakers: A. Patterson (Pennsylvania State University), C.G. Knutson (MIT), G.H. Perdew (Pennsylvania State University), P.J. Turnbaugh (UC San Francisco), A. Gerwitz (Georgia State University)

When: 9:00 – 11:45 am

Where: CC Ballroom 6B

Workshop Session: Evaluating Similarity across Related Complex Mixtures: The Challenge of Herbal Supplements

Session chairs: Cynthia Rider (NIEHS) and Joseph Betz (ODS)

Speakers: J.M. Betz (ODS), K. LeVanseler (NSF), J. Harnly (USDA), C.V. Rider (NIEHS), C. Gennings (Mount Sinai)

When: 9:00 – 11:45 am

Where: CC Ballroom 6C

Workshop Session: 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

Session chairs: George Woodall (US EPA) and Paul White (University of Ottawa)

Speakers: A.J. Cohen (Health Effects Institute), P. White (University of Ottawa), G.M. Woodall (US EPA), D. DeMarini (US EPA), J.M. Samet (USC Los Angeles)

When: 1:30 – 4:15 pm

Where: CC Room 1



Call for 2016 Session Proposals

David Herr, PhD

MixSS Vice 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 2016 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 2016 SOT Annual Meeting to highlight the innovative science which is being conducted by our membership. Proposals are due to SOT headquarters by April 30th, 2015. In order to allow for feedback from the Mixtures Specialty Section, submissions should be provided to Dr. David Herr (Herr.David@epa.gov) by April 6th, 2015. If you have any questions, please feel free to contact David Herr, 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
 - eWaste
 - Fracking fluids
- **Mixtures in epidemiology research**

Joint RASS-MixSS Webinar:

Brenda Eskenazi

Kembra Howdeshell, PhD
MixSS Webinar Coordinator
NIEHS/DNTP



The second Joint Risk Assessment Specialty Section (RASS) and Mixtures Specialty Section (MixSS) webinar of the 2014-2015 series was held on February 11, 2015. The invited speaker was Dr. Brenda Eskenazi of the School of Public Health at University of California, Berkeley. Her presentation on CHAMACOS (The Center for the Health Assessment of Mothers and Children of Salinas): Lessons from the Field reviewed her research on the potential risks of pesticide exposure (namely, organophosphate pesticides, fumigants, fungicides and pyrethroids) to child health in this longitudinal birth cohort of primarily Latino farmworker families in the Salinas Valley, CA. She provided her perspective on the complexity of assessing human exposure to pesticides and limitations in studying mixtures. The webinar was well-attended with 71 participants and the audio and presentation can be accessed at:

<http://www.toxicology.org/ISOT/SS/RiskAssess/downloads.asp>.

Any suggestions for future joint Mixtures SS and RASS webinars can be emailed to Kembra Howdeshell at howdeshellkl@niehs.nih.gov.

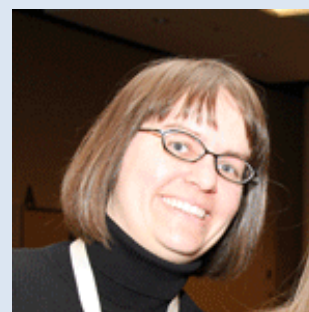
New MixSS Officers

Vice President-Elect: Cynthia Rider, PhD, DABT



Dr. Cynthia Rider will serve as the incoming Vice President-Elect. She is completing her second term as Secretary-Treasurer of the Mixtures Specialty Section and previously served as the post doctoral representative (2009-2010). Cynthia is a toxicologist with the National Toxicology Program (NTP) at NIEHS, where she has been actively involved in developing mixtures research projects aimed at informing the cumulative risk assessment process. She serves as lead study scientist for a diverse portfolio of projects addressing the toxicity and/or carcinogenicity of test articles including polycyclic aromatic compounds and herbal products. Cynthia is looking forward to a great year with MixSS!

Secretary/Treasurer: Erin Hines, PhD



Dr. Erin Pias Hines is a Biologist at the US Environmental Protection Agency, where she is the reproductive and developmental toxicology and cancer/genotox leader for the Integrated Science Assessment (ISA) documents that are generated by the agency as mandated by the Clean Air Act in support of the establishment of the National Ambient Air Quality Standards regulating the criteria air pollutants. Erin works in the field of risk assessment and hazard identification on the ISAs and the air pollution mixtures-related exposures in the Multipollutant Science Document. Dr. Erin Pias Hines

served on the SOT Committee for Diversity Initiative from 2010-2013, chairing the CDI from 2012-2013 and co-chairing from 2011-2012. Erin has served as a host mentor for the Education Committee's Undergraduate Education Program at the Annual SOT meeting from 2006-2014, with a break in 2012 to have a child. Erin looks forward to the opportunity to provide further support to SOT and the Mixtures Specialty Section.

Councilor: Nigel Walker, PhD, DABT



Dr. Nigel Walker is Deputy Director of the Division of the National Toxicology Program at the National Institute of Environmental Health Sciences (NIEHS), one of the National Institutes of Health (NIH). Dr Walker's experience covers environmental toxicology, quantitative dose response modeling and risk analysis, with particular emphasis on understanding the toxicology and carcinogenicity of mixtures, dioxins and other persistent organic pollutants, and nanoscale materials. He has been an active member of SOT for almost 20 years having served as President of the North Carolina SOT chapter, a founding member and councilor of the Nanotoxicology Specialty Section, a member of the SOT Current Concepts in Toxicology Conference Committee and member of the SOT Committee on Public Communications.

Post-doctoral Representative: Julia Rager, PhD



Dr. Rager received a MSEE and PhD from the University of North Carolina's Environmental Sciences and Engineering Department. During this time period, she acted as the MixSS Graduate Student Representative and greatly enjoyed the opportunity to contribute leadership to the specialty section and participate in additional Society of Toxicology (SOT) events. Dr. Rager is currently continuing her involvement in mixtures-related research as a postdoctoral scientist at the U.S. Environmental Protection Agency. One of her current investigations involves the non-targeted assessment of chemicals in household dust, a topic of high interest to mixtures toxicology. Highlights of her career include receiving SOT's prestigious Graduate Student Novartis Award, SOT's Syngenta Fellowship Award in Human Health Applications of New Technologies, and the AJP – Lung Cellular and Molecular Physiology Junior Investigator Award.

Graduate Student Representative: Axelle Marchand, BS, MS



Axelle Marchand is a Ph.D. student in Public Health (toxicology and risk analysis option) at Université de Montréal in Quebec, Canada. She recently obtained her Master in environmental and occupational health at the same university. Her research project consisted of evaluating possible interactions occurring between four common volatile organic compounds following human inhalation exposures to mixtures and the resulting levels in blood and urine. The project was conducted in collaboration with Health Canada who intends to use the results to further interpret CHMS data. She is also interested in physiologically based pharmacokinetic modeling. She received a SOT Top 5 Abstract Award in the Mixture Specialty Section as well as the Best Student Abstract Award (2013).

Thank you to our outgoing officers!

Melanie Doyle-Eisele (Councilor) has done an excellent job leading the charge to recruit new MixSS members. She is also responsible for leading the committee on selecting the best mixtures abstracts from the SOT 2015 abstract pool.



Former MixSS officers Kembra Howdeshell, Melanie Doyle-Eisele, and David Mattie at the 2014 Reception

Ron Pringle is completing his service as the post doctoral representative and Nicole Kurhanewicz has done a fabulous job in her two terms as graduate student representative. We wish you two the best in your next SOT endeavors!

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

To run for office, contact President Bruce Fowler (drtox@earthlink.net). Open positions for the 2016-2017 term include councilor, post doctoral representative and graduate student representative.



Past President David Mattie with President Bruce Fowler

State of the MixSS

Founded: 2006

Financials: \$4,986 as of Dec 31, 2014

Award sponsors: Wiley and ToxServices LLC

Ask someone you know to join the MixSS

Melanie Doyle-Eisele, PhD
MixSS Councilor
Lovelace Respiratory Research Institute

The Mixtures Section provides a forum for the interaction of SOT members to discuss the impact of combination effects on current regulations, growing fields in science, and also immediately impacts research that is presented at national conferences.

You can find more information about the MixSS at our website: <http://www.toxicology.org/isot/ss/mix/>

Membership is \$20 per year for full and associate members and \$15 for student and post doc members and only requires that you are a member in good standing with SOT. Remember, students get one free Specialty Section membership – make yours the MixSS! You can become a member at any time by completing the application on-line.

Upcoming Events

Workshop: Statistical Approaches for Assessing Health Effects of Environmental Chemical Mixtures in Epidemiology Studies

Dates: July 13-14, 2015

Location: NIEHS, Research Triangle Park, NC

Website:

http://tools.niehs.nih.gov/conference/dert_epidemiology_2014/

Goals: This workshop will bring together experts in the fields of epidemiology and biostatistics to identify, develop, refine, and disseminate methods for quantifying the health effects of environmental chemical mixtures. Each expert participant will provide an extended abstract of their specific approach to the other expert participants approximately 6 weeks before the workshop and will come to the workshop and present their results. The workshop will also result in a comprehensive document for publication that summarizes the findings from the workshop and outlines the best approaches and computational/conceptual/statistical models for determining or predicting health effects of mixtures.