Notes: SPAN Webinar; Trainee Presentations

Monday, July 24th, 2023, from 2:30 – 4:30 PM ET

Attendees:

Emily Briese (Arizona)
Jin Y. Chen (Louisville)
Hsing-Chieh (Candice) Lin (TAMU)
Victoria Colvin (OSU)
Dan Conklin (Louisville)
Prakash Dangal (LSU)
James Dodds (NCSU)
Tammy Dugas (LSU)
Jerika Durham (Kentucky)
Angela Gutierrez Echeverri (Kentucky)
Rocio Estrella (Arizona)
Lucie Ford (TAMU)
Emily Green (Duke)
Farhana Hasan (LSU)
David Hein (Louisville)
J. Zach Hilt (Kentucky)
Javier Huayta (Duke)
Victoria Klaus (Kentucky)
Susan Korrick (Harvard)
Gregory Kudzin (TAMU)
Avinash Kumar (LSU)
Candice Brinkmeyer-Langford (TAMU)
En Hsuan Lu (TAMU)
Francesca Macaluso (Colorado)
Raina Maier (Arizona)
Marina Malovichko (Louisville)
Craig Marcus (OSU)
Jennifer Moore (Kentucky)
Obinna Nwokonkwo (Arizona)
Susan D. Perez (Arizona)
Christian Isaac Rude (OSU)
Juan Sebastian Salazar (UC Berkeley)
Sarah Schwartz (UC Berkeley)
Lindsey St. Mary (OSU)
Robyn Tanguay (OSU)
Breandon Taylor (Louisville)
Sara Thomas (CAES)
Eva Vitucci (TAMU)
Hui Wang (Iowa)
Brian Westra (Iowa)
Katherine (Katie) Wolf (UC Berkeley)

Danielle Carlin (NIEHS)
Heather Henry (NIEHS)

Maggie Wiener (MDB)
Adeline Lopez (MDB)
Mali Velasco (MDB)
Michelle Zhao (MDB)
Dylan Williams (MDB)

Agenda

I. **Trainee Presentations**

Arizona State University
Emily Briese

- Works on Harvard SRP's Metals and Metal Mixtures, Cognitive Aging, Remediation and Exposure Sources (MEMCARE) Project 4: Designing selective sorbents for water remediation.
- Future work will focus on removing oxo-anions from drinking water through adsorption. This is done through Surface Complexation Modeling (SCM) and Pore Surface Diffusion Modeling (PSDM) for a variety of packed-bed column configurations, as well as Linking Density Functional Theory (DFT) energetics to predict surface characteristics and pursue new material design.

Connecticut Agricultural Experiment Station (CAES)

Sara Thomas

- Works on phytoremediation of PFAS using nanomaterials as enhancers, an SRP trainee with Yale University's SRP Center.
- Her work includes the extraction of PFAS on soil and plant matrix, targeted and non-targeted analysis of PFAS, hydroponic studies on plants for PFAS uptake, and collaboration with other institutes. Upcoming research will focus on how to degrade contaminated plant biomass.

Duke University

Emily Green

- Works under Duke SRP Center Project 4: Neurobehavioral and Bioenergetic Consequences of Evolving Resistance to Polycyclic Aromatic Hydrocarbons in a Multi-Stressor Environment focused on specific regions in Virginia contaminated with polycyclic aromatic hydrocarbons (PAHs).
- Research focuses on studying differences in gut-microbial populations in Atlantic Killifish in clean and polluted sites.
- Interest in researching how pollution impacts the gut microbial community, and will continue to research the role of the microbiome in mediating resistance to PAH exposure in Atlantic Killifish populations with different pollution adaptation histories.

Javier Huayta

- Works under Duke SRP Center Project 3: Mitochondrial and Cellular Mechanisms of Neurotoxicity of Superfund Chemical Co-Exposures.
- He studies C. Elegans to test if co-exposures to PAHS and the metals lead and cadmium cause developmental and later-life neurotoxicity by altering "hardwiring" (cell fate and morphology). He also tests if co-exposures caused developmental and later-life neurotoxicity via altered "programming" (how cells develop and function).

Louisiana State University

Prakash Dangal

- His research focuses on biophysical research, air pollution, particulate matter (PM), hydroxyl radicals, reactive oxygen species (ROS), and human health. In addition, his existing work focuses on lab based PM2.5, and in his upcoming work, he will be studying particulate matter extractions from air using high volume air samplers.
- His research interests include air pollution, analytical instruments (EPR, GC/MS), public health, and data analysis and may later include chemical analysis of environmental pollutants, pollution related disease monitoring in the US and globally, and biostatistics.

Farhana Hasan

- Work is focused on the environmentally persistent free radicals (EPFRs) and ROS in particulate matters of electronic cigarettes and flavor compounds.
- Her research interests focus on organic pollutants, cigarette related studies, and investigation of EPFRs and volatile organic compounds (VOCs) in 3D printer emissions.
- Future work will include investigating the generation and quantification of EPFRs in flavoring compounds, as well as sensor development to detect and quantitate EPFRs in the field settings.

Avinash Kumar

- Works on LSU SRP Center's Project 1: Environmentally Persistent Free Radicals Alter Pulmonary Immunologic Homeostasis.
- His research interests include air pollution, environmental toxicology, infectious diseases, and public health.
- He was awarded the 2022 K.C. Donnelly Externship to conduct research in the lab of Dr. Ilona Jaspers at the University of North Carolina at Chapel Hill.
- His upcoming work will focus on defining the mechanism by which airway microbial dysbiosis impairs IL22 expression following PM exposure and determining the molecular mechanism responsible for the lack of IL22 induction following Flu infection during PM exposure.
- He hopes to study the role of PM-containing EPFRs in the pathogenesis of type 2 diabetes in the future.

Oregon State University

Christian Rude

- Works on OSU SRP Center's project Predicting The Toxicity of Complex PAH Mixtures.
- His research interests include using Physiologically Based Pharmacokinetic (PBPK) models to predict PAH dose in developmental exposures, novel transcriptomic applications for investigating PAH and PAH mixture toxicity, and non-canonical PAH toxicity mechanisms.
- His current and upcoming projects include putting together the TeamTOX summer camp, predicting PAH dose with PBPK models, and spatial transcriptomic analysis for tissue specific toxicity.

Lindsey St. Mary

- Works on OSU SRP Center's project Predicting The Toxicity of Complex PAH Mixtures.
- She is focused on the identification, measurement, and toxicity of PAHs.
- Her research interests include gene network activation by xenobiotics, transcriptomic sequencing to investigate xenobiotic toxicity, and streamlining chemical screening and gene profiling.

Texas A&M University

Lucie Ford

- Works on TAMU SRP Center's Project 4: Inter-tissue and -individual Variability in Responses to Mixtures.
- She specifically works on hazard characterization and grouping of PFAS using an optimized human cell-based battery of broad coverage assays.
- Her research interests include cell culture – population-based models and organotypic models, high-content imaging analyses, and dose-response modeling.

Hsing-Chieh (Candice) Lin

- Works on TAMU SRP Center's Project 4: Inter-tissue and -individual Variability in Responses to Mixtures.
- Focuses on *in silico* modeling, *in vitro* datasets, and *in vivo* prediction.
- Upcoming work will focus on PFAS exposure from industry, consumer products, and contaminated food, and applying the new in vitro–in vivo extrapolation (IVIVE) method to predict the human *in vivo* renal clearance for a group of PFAS to fill a persistent data gap.

En-Hsuan Lu

- Works as part of TAMU SRP Center's Risk and Geospatial Sciences Core.
- His research focuses on establishing scientific confidence in the concordance of *in vitro* and *in vivo* protective points of departure utilizing a fully adjusted human equivalent concentration to align with human-based in vitro PODs as part of his approach.

Gregory Kudzin Phillip

- Works on TAMU SRP Center's Project 1: Novel analytical and computational strategies for exposure assessment of complex mixtures.
- His work focuses on investigating ambient blood-based samplers for per- and polyfluoroalkyl substance (PFAS) quantitation and detection.
- Current project results indicate that developed method improvements increased PFAS extraction by 10-fold, and future project goals include researching how stability compares between ambient samplers and whole blood samplers, and what samplers can achieve the best detection levels.

Eva Vitucci

- Works on TAMU SRP Center's Project 2: mRAPiD: Mobile Responding to Air Pollution in Disasters.
- Her research interests include in vitro mechanisms, organotypic modeling, molecular biology, and intercellular signaling, and her research goal is to develop novel tools to investigate pediatric respiratory risks from VOCs.
- Ongoing projects include developing an *in vitro* pediatric airway model to rapidly characterize respiratory risks from hazardous VOCs and to determine mechanisms of VOC-induced respiratory risks. In the future, she will investigate cellular signaling pathways and transcriptional responses.

University of Arizona

Susan D. Perez

- Works on University of Arizona SRP Center's Project 5: Importance of Capping Material Properties in Remediation of Mine Tailings.
- Biosynthetically derived glycolipids have a high affinity for Rare Earth Elements and Elements of Environmental Concern, and so there is potential for cleaning waste waters and harvesting metals, especially from mining influenced waters. She researches if these glycolipids have the same affinity for metals and if glycolipids can select for specific metals.

University of California, Berkeley

Juan Sebastian Salazar

- Works on UC Berkeley SRP Center's Project 4: In Situ Destruction Of Halogenated Superfund Contaminants With Persulfate-Generated Radicals.
- The work of this project is to enhance the efficacy of ISCO processes for treating highly chlorinated hydrophobic compounds.
- He is also a Fulbright Scholar from Columbia.

Sarah Schwartz

- Works on UC Berkeley SRP Center's Project 3: In Situ Destruction Of Halogenated Superfund Contaminants With Biological Radical Reactions.

- She researches enzymes that generate reactive free radicals.
- In upcoming work, she will work on science communication tools for Berkeley, educational design/outreach for high school science courses, and collaborate with local governmental agencies.

University of Colorado

Francesca Macaluso

- Works on Harvard SRP MEMCARE Community Engagement Core.
- Her research interests include policy development, research translation, environmental metals exposure, and community engaged research methods.
- MEMCARE-SLV is a community-engaged citizen science project working with pregnant persons and young children in the San Luis Valley, Colorado to conduct environmental/biomonitoring of heavy metals. Her upcoming projects will include specially designed water filters and longitudinal geospatial water quality analysis.

University of Iowa

Hui Wang

- Works on University of Iowa SPR Center's Project 1: Airborne PCBs and Their Metabolites: Risk Factors for Adverse Neurodevelopmental Outcomes in Adolescence.
- His research involves determining the effects of human metabolites of airborne PCB on neurotoxicity and behavioral outcomes in rats exposed during adolescence.
- His focus is on toxicology, analytical chemistry, neuroscience, and bioinformatics.
- In upcoming work, he will assess the neurotoxicity of subacute exposure to 4-OH-PCB 52 in female adolescent rats via polymeric implants.

University of Kentucky

Jerika Durham

- Works on University of Kentucky SRC Project 1: Superfund Chemicals, Nutrition, and Multi-Organ Cardiovascular Risk.
- Her research interests include investigating environmental insults on carcinogenesis and immunotoxicity, and her current project goal is to investigate the effect of PFOS on normal intestinal tissues and APC-driven carcinogenesis and immunotoxicity.
    - She has found that PFOS exposure alters gene expression associated with cancer, upregulation of lipid metabolism, and dysregulation of immune responses in normal intestinal tissues. In a previous study on diet and mice, mice exposed to PFOS in drinking water had higher gene enrichment for lipid metabolism and immune response and higher levels of genes involved in colon cancer.

Victoria Klaus

- Works on University of Kentucky SRC Project 3: Responsive Membranes and Advanced Materials for Sensing and Remediation of Halo-organics.
- Her work focuses on the development of hydrogels and hydrogel composites for remediation of PFAS in aqueous solutions and the GI tract. The research team has successfully developed materials and characterized for affinity for PFAS in water systems and they will explore application as an enterosorbent that will remove PFAS from the GI Tract.

University of Louisville

Jin Chen

- Her research aims and interests include exposures to environmental pollutants, discovering biomarkers of exposures in urine, and health outcomes.
- Upcoming research and trainings will include effort on how to assess health outcomes of exposures to environmental pollutants, to examine associations between discovered biomarkers of exposure to health outcomes, and potentially learn new instruments/techniques (CyTOF, cell exposure).

Breandon Taylor

- His research focuses on the effects of VOC exposure on vascular inflammation & cardiovascular disease.
- His current studies focus on how benzene exposure influences immune cell infiltration and how this affects lesion composition and vulnerability. Future work will include mechanisms of immune-trafficking in plaque, how cells are recruited to the plaque and how this contributes to vulnerability and stability, and T cell-lymphatic endothelium communication.

II. **Training Core Activities and Round Robin Updates**

University of Kentucky

Zach Hilt

- UKSRC held their second annual Alumni Webinar on June 29th, inviting alumni, trainees, and staff of the UKSRC to have them share their experiences with current trainees via Zoom.
    - Next year they will hold it in person. This event is designed to bring back.

Oregon State University

Craig Marcus

- OSU and LSU are partnering to subsidize attendance for the Pacific Northwest SOT Chapter Meeting and are sponsoring a 1-day science communication workshop (September 17-18, 2023).
- The theme for the PANWAT meeting is Modern Computational Approaches for Predicting Adverse Human Health Effects.

III. **Adjourn**

The 2023 SRP Annual Grant Recipient Meeting is scheduled for **December 4-6, 2023 in Albuquerque, New Mexico** – co-hosted by the University of New Mexico SRP Center.

- Abstracts and registrations due by September 15.

Additional Information:

I. **K.C. Donnelly Externship Award**
    - Congratulations to the batch of 2023 K.C. Donnelly Externship Award winners!
        - Eric Brown, University of North Carolina at Chapel Hill
        - Asta Habtemichael, University of Rhode Island
        - Nobel Hernández-Otero, Northeastern University & University of Puerto Rico
        - Victoria Klaus, University of Kentucky

- Wil Lieberman-Cribbin, Columbia University
- Irene Martinez-Morata, Columbia University
- Sara Thomas, Connecticut Agricultural Experimental Station & Yale University

II. **Reminder to use the SRP Data Collection Tool (DCT) to submit Trainee Highlights!**
   - SRP Data Collection Tool
   - Please work with your RT Coordinator to submit entries on awards, publications, honors, videos, and photos of activities. SRP uses these entries to learn about what trainees are doing and to select trainees to highlight in the E-Posted! We also consider submitted photos for the E-Posted Photo of the Month! Submitting highlights helps you with the Annual Update Process!

III. **Reminder to update CareerTrac** (https://careertrac.niehs.nih.gov/public/home)
   - CareerTrac captures professional development, publications, and other activities trainees are involved in. Trainees should enter their own information (with approval from mentors).

IV. **Wetterhahn Award -** Karen Wetterhahn Memorial Award
   - Nominations opened on July 1st, 2023 and closed on August 7th, 2023.
   - Winners will be announced during the 2023 SRP Annual Meeting.

V. **Reminder to send updates to SPAN Leadership Committee**
   - These will be taken September/January of each year (please limit to 1 – 2 graduate students/Post-Docs per Center to keep up with the listserv)
   - Please email your nominations to danielle.carlin@nih.gov and indicate the current status of the new member (e.g., graduate student or Post-Doc)
   - Membership of the SPAN Leadership Committee is a two-year term.

VI. **SRP Website – for SPAN/Training**
   - http://www.niehs.nih.gov/research/supported/srp/training/index.cfm
   - Notes from all previous SPAN Zoom Discussions are posted here.

VII. **SRP e-Posted: Trainee Highlights**
   - Training Core Leaders, please send Dylan Williams (dylan.williams@nih.gov) or Mali Velasco (mali.velascodelgado@nih.gov) any news items of interest to trainees (e.g., trainee success stories, pictures, job announcements).
   - Highlighting trainee videos in the e-Posted via SPAN.

VIII. **SRP/NIEHS on LinkedIn:** https://www.linkedin.com/groups/8565066
   - Note: this is for SRP Trainees only