

# Superfund Research Program *e-Posted Notes*

SRP Annual Meeting Special Edition

## E-Posted Notes Special Edition: 2022 SRP Annual Meeting

### SRP Annual Meeting Celebrates 35 Years of Science and Solutions

The NIEHS Superfund Research Program (SRP) 2022 Annual Meeting, which took place Dec. 14-16 in Raleigh, North Carolina, brought together more than 550 researchers, administrators, trainees, and partners from across the nation.

This special edition e-Posted Notes provides a recap of sessions, photos, and other moments throughout the meeting. Thanks to everyone involved in the annual meeting, and a special thanks to the organizers and hosts from the University of North Carolina at Chapel Hill (UNC) and North Carolina State University (NCSU), for making it a success!



Participants gather to kick off the SRP Annual Meeting.

For a broad overview of the meeting, see the [NIEHS Environmental Factor story](#).

### Welcoming Grantees

NCSU SRP Center Director **Carolyn Mattingly** and UNC SRP Center Director **Rebecca Fry** kicked off the event and thanked everyone for attending the first in-person meeting in three years.

NIEHS Director **Rick Woychik** gave opening remarks and dedicated the meeting, celebrating the program's 35 years, to NIEHS SRP Director **Bill Suk**, who retired at the end of December.

Highlighting the theme of the meeting, keynote speakers stressed the importance of representation to achieve environmental justice:

- **Jonathan Jackson** of Massachusetts General Hospital discussed how lack of representation destabilizes science, and how incorporating intersectionality and equity is the primary driver of research innovation.
- **Kim Fortun** of the University of California (UC), Irvine, explained how people's social and cultural positions frame the way they see situations and how environmental justice requires an intersectional lens.



"Bill Suk has led SRP from the beginning. His strong focus on multidisciplinary research, community engagement, translation, and trainees as the next generation of scientists have been vital to the program's success," Woychik said.

### Main Meeting Sessions: Scientific Innovations and Solutions

Throughout the meeting, attendees learned about innovative projects that promote environmental health and justice, particularly research driven by early-stage investigators and trainees.

## Highlighting Results From KC Donnelly Awardees

Three [2021 KC Donnelly Externship Award](#) winners described their collaborative research.

- **Ariel Robinson** of the University of Kentucky (UK) described new analytical techniques she learned at NCSU to identify and quantify per- and polyfluoroalkyl substances (PFAS) in sewers.
- Oregon State University (OSU) trainee **Victoria Colvin** shared how her externship at the Massachusetts Institute of Technology (MIT) equipped her with a new tool to assess DNA damage resulting from exposure to polycyclic aromatic hydrocarbons (PAHs).
- **Matthew Dunn** of the University of Rhode Island (URI) described how working with SRP-funded small business Cyclopure helped him validate and field test a new passive sampling method for PFAS.



Robinson, second from right, pictured with other current and former UK SRP Center trainees at the meeting. (Photo courtesy of the UK SRP Center)

Other KC Donnelly winners were featured throughout the scientific sessions.

### Session 1: Human Health Research

The first scientific session highlighted research to understand how environmental contaminants can harm health at the cellular or molecular levels.

- Columbia University trainee **Maya Spaur** shared how contaminated drinking water contributes to arsenic exposure, measured in urine, in Native American communities.
- **Skarlet Velasquez** of the University of Georgia described new mixtures methods she learned through her externship at Dartmouth to understand connections between phthalate exposures and birth outcomes.
- Baylor College of Medicine trainee **Guobin Xia** shared how his externship at UC Davis allowed him to explore new molecular therapies against PAH- and high oxygen-induced lung injury early in life.
- **Edward Levin**, project leader at Duke, discussed the need for a spectrum of complementary approaches for screening and predicting potential toxicity of chemicals.



Spaur received a [2020 KC Donnelly](#) award. (Photo courtesy of Maya Spaur)

### Session 2: Susceptibility and Risk Factors

In session 2, presenters described methods to assess health risks from exposure to hazardous substances.

- **Breandon Taylor** of the University of Louisville described a new exposure method for cell-based studies he learned during his externship at LSU to study the toxicity of 1,3-butadiene in the lungs.
- University of Iowa trainee **Amanda Bullert** shared her findings on PCBs and their metabolites detected in the brain, lungs, and serum of rats following exposure.
- **Lee Pribyl** of MIT explained his research using studies in mice to investigate DNA mutations from N-Nitrosodimethylamine (NDMA) exposure.
- Harvard trainee **Zunwei Chen** discussed his work using proteomics to assess the effects of cadmium exposure on extracellular vesicles.



Taylor describes an air-liquid cell-based exposure method he learned during his externship.

### Session 3: Exposure Science and Detection Technologies

The third session featured methods and technologies to detect hazardous substances in the environment.

- **Alexandra Cordova** of Texas A&M University (TAMU) shared her KC Donnelly experience learning new analytical and remote sensing techniques at the Los Alamos National Laboratory to characterize PAH exposures following disasters.
- MIT project leader **Tim Swager** explained his research to understand the complex chemistry of nitrosamines and to develop better tools for detecting them.
- **Prabha Ranasinghe** of Duke explained complex interactions between PAH exposure, the gut microbiome, and fish metabolism and behavior.
- NCSU trainee **Jesse Chappel** shared how molecular changes in cancer versus noncancer tissues can be used to create risk scores to evaluate disease risk.



#### Session 4: Prevention, Intervention, Remediation

In session 4, presenters shared biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances.

- **Kamila Murawska-Wlodarczyk** of the University of Arizona shared results from her externship at UC San Diego where she learned new strategies to help plants that accumulate and remove chemicals from the environment to thrive in harsh conditions.
- **Sara Thomas** of the Connecticut Agricultural Experiment Station described her work on an individual research project through Yale University to combine nanoparticles and plants to enhance PFAS cleanup on Tribal lands.
- UK trainee **Maria Victoria Klaus** explained how specialized hydrogel polymers can remove PFAS from water.
- UC Berkeley trainee **Tae-Kyoung Kim** described an innovative method to clean up and destroy hexachloroethane using less energy.



#### Session 5: Enabling Systems Level Science

Session 5 highlighted tools and technologies to enable systems level science.

- **Luisa Feliciano** of the University of Puerto Rico shared how geospatial artificial intelligence and machine learning can assess wind and flooding damage as a proxy for potential exposures following disasters.
- **Julia Rager** of the UNC Data Management and Analysis Core shared their inTelligence And Machine IEarning (TAME) toolkit, for which she was awarded the UNC Teaching Innovation Award.
- University of New Mexico trainee **Theodros Woldeyohannes** shared how he is using remote sensing to respond to community concerns about fires at unregulated waste disposal sites.
- **Subham Dasgupta**, a former Oregon State University trainee, shared his KC Donnelly experience at Dartmouth learning single cell



sequencing techniques to understand the mechanisms by which PAHs disrupt behavior in zebrafish.

## Session 6: Systems Approaches to Environmental Justice

The sixth and final session highlighted how a systems approach can help address environmental injustice.

- **Leanne Fawkes** of TAMU explained how meaningful community engagement can help promote equitable resilience in the aftermath of disasters.
- University of Buffalo trainee **Rebecca Dickman** shared how her [2022 externship](#) at U.S. EPA equipped her with new non-targeted analytical techniques to quantify PFAS when standards are lacking.
- **Nancy Cardona Cordero**, a former Northeastern University trainee, discussed her [2017 externship](#) at the University of Arizona, where she learned how community engagement can better reveal product use patterns during pregnancy that may affect exposure to phthalates.
- **Susan Pinney** of the University of Cincinnati introduced a new educational tool to improve communication between community organizations, government agencies, and researchers. Each module, developed in collaboration with MIT, includes first-hand experiences and lessons learned during the process of hazardous waste cleanup.



Dickman is a trainee on an individual research project. (Photo courtesy of Rebecca Dickman)

## Successes of Multidisciplinary Training

Throughout the meeting, SRP trainees were in the spotlight, with nearly 200 current and former trainees presenting their work.

### 2022 Wetterhahn Award: Amanda Armijo

SRP selected **Amanda Armijo** from MIT for the [2022 Wetterhahn Memorial Award](#). Armijo was recognized for her research to explore how the chemical NDMA damages genes.



After accepting the award, Armijo presents her research. (Photo courtesy of Steve McCaw, NIEHS)

### Graduate Student Poster Winners

The graduate student poster competition provided an opportunity for SRP trainees to explain their research and showcase innovative findings. Congratulations to the six students who received awards in the annual poster competition!

- **Kaylie Kirkwood**, NCSU
- **Emily Bonner**, OSU
- **Mikayla Armstrong**, UNC
- **Dillon King**, Duke
- **Hannah Starnes**, NCSU
- **Seonyoung Park**, University of Michigan



Four of the six poster competition winners pictured with Suk, from left to right: Bonner, Armstrong, Starnes, and King. (Photo courtesy of Steve McCaw, NIEHS)

To learn more about their posters, see the [annual meeting website](#).

## Satellite Sessions Open Doors for Collaboration

### Promoting Environmental Justice

The Research Translation and Community Engagement Core satellite meeting kicked off with an ice

breaker for participants to get to know each other.

Later presentations were from TAMU researcher **Galen Newman** and **Mónica Ramírez-Andreotta** of the University of Arizona. Newman introduced his project to quantify and visualize green infrastructure intervention strategies to prevent flood risk in a Texas community. Ramírez-Andreotta offered tips for participatory research projects aimed at structural change, including embracing local knowledge, encouraging community participation, and leveraging data science.

A panel discussion focused on advancing environmental justice. The panel featured community leaders Rev. William Kearney and Hon. Eva Clayton and NCSU researcher Emmanuel Obeng-Gyasi, who emphasized the value of consistent dialogue between researchers and the communities they work with. The experts also explained that building relationships between researchers and communities takes time and encouraged participants to attend community meetings and communicate research in a way that allows people to take action to protect their health.



From left to right: Obeng-Gyasi, Kearney, Clayton, and NCSU trainee Krystal Taylor, who moderated the session. (Photo courtesy of Steve McCaw, NIEHS)

## Making SRP Data FAIR

During the Data Management and Analysis Core (DMAC) satellite session, newer centers had a chance to share their overall goals while connecting with colleagues from established centers to discuss common challenges and best practices toward making SRP data more FAIR (findable, accessible, interoperable, reusable). In a joint session with the training core, participants had an opportunity to explore future data training needs, while a joint session with the PFAS analytical working group provided insight into better ways DMACs and PFAS projects can effectively analyze and share data.



SRP DMAC representatives gather for a group photo.

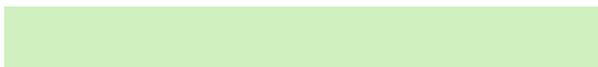
## Tackling PFAS as Emerging Contaminants

The PFAS Analytical Networking Group satellite session brought together grantees, trainees, and federal researchers to discuss non-targeted analysis of the vast array of unknown PFAS. Targeted analysis, by contrast, is limited to known groups of PFAS.

James McCord from EPA presented approaches for non-targeted analysis of PFAS, including how to detect and identify unknown compounds.

McCord also joined a panel of PFAS experts, including Mark Strynar from EPA, **Lee Ferguson** and **Heather Stapleton** from Duke, and **Detlef Knappe** from NCSU to discuss challenges and to answer questions.

The session closed with a joint workshop with DMAC representatives to explore how to improve analysis, storage, and sharing data at their centers. Takeaways from the workshop included the need for standardized data templates and naming conventions, as well as working on optimal ways to communicate findings. Participants also mentioned the importance of project leaders collaborating with their DMACs early in the research process to discuss analysis needs to ensure essential data and metadata is captured.





PFAS expert panel from left to right: Knappe, McCord, Stapleton, Ferguson, and Strynar