

Day 2 Breakout Session: Topic 5 – Mixtures across Time

Chairperson: Dana Boyd Barr, PhD

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High Impact/Short Timeframe

- In vivo animal studies for determining latent effects of exposures including mixtures during developmental periods.
 - ensure animal models are appropriate for the end point studied and for aging
 - conduct non contemporaneous relevant co-challenges that alter susceptibility or induce persistent or subclinical effects
- Evaluate subtle genetic changes from existing low dose mixture studies (epigenetic and genetic)

High Impact/Short Timeframe

- Continue to implement exposure averaging ensuring the averages are over times of clinical significance (include metabolites and persistent effects)
- Couple whole or partial mixture 'exposures' to functional assays and in silico models but anchor to in vivo assays

High Impact/Short Timeframe

- Define exposure mixtures using long term individual and population longitudinal and spatial data
 - Explore unconventional partnerships (e.g. grocery sales information, industry product databases, bar code ingredient databases)
 - Mine data from existing longitudinal studies and integrate birth cohorts with child cohorts and healthy aging populations
 - Piggy back onto existing longitudinal studies to include exposure data or use archived samples (e.g. GEN-R) potentially forming consortia

High Impact/Short Timeframe

- Longitudinal qualitative and quantitative analyses of common matrices or mixtures
- Laboratory capacity-building to enable high throughput analyses with appropriate QA/QC
- Use of pattern recognition techniques to identify changes in whole or partial mixture patterns using chromatograms
- Use exposure models along with monitoring data, fate and transport and HAP to understand co-exposures
- Statistical strategies to cluster population with similar exposures
 - Couple with metabolomics to determine any prominent effects

High Impact/Short Timeframe

- Infrastructure-related issues
 - Encourage transparency in product ingredient lists
 - Funding for rapid, HTS, comprehensive analytic technologies for monitoring
 - Develop these technologies
 - Standardize national database variables (e.g., NHANES and US census sociodemographic variables differ)

Discussants

Dana Boyd Barr (Chair)

Chad Blystone

George Bollweg

Herb Buxton

Danielle Carlin

Stephania Cormier

June Dunnick

Russ Hauser

Jerry Heindel

Shyamal Peddada

Joanna Matheson

Andrew Salmon

Jane Ellen Simmons

Linda Teuschler

Sheetal Thakur (rapporteur)

Tracey Woodruff