

Day 2 Breakout Session: Topic 3 – Epidemiology and Toxicology

Chairperson: Tom Webster, DSc
Boston University

Priority Matrix

Degree of Impact	High		
	Low		
		Short	Long
		Time scale	

Short timeframe < 3 years, Long timeframe > 3 years

Low impact will only incrementally advance a limited area of mixtures research, high impact will advance the field significantly

High Impact/Short Timeframe

- Collaboration between toxicologists (biologists) and epidemiologists
 - Grouping, potency, from start to finish
- Epidemiology informing toxicology!
 - Experimental testing of interactions (e.g. stress x toxicant) / relevant mixtures for animal models
- Re-analysis of data with potency factor re-weighting or for joint effects

High Impact/Short Timeframe

- Resources for:
 - Interactions that have been observed (non-published sources)
 - Potency factors
- Epidemiologists should be involved in TOX 21
- People trained to interface between tox and epi (biostat, exposure scientists as well)
 - Knowledge of biology, physiology, mechanisms
 - Organized around a single problem perhaps

High Impact/Short Timeframe

- Study section for mixtures
 - Special emphasis panel
- Conferences & workshops
- Could there be a specific grant mechanism for scientists to retrain in other fields (other than clinicians)?
 - K, F-32

High Impact/Long Timeframe

- More data on potency factors
 - Would like to use, but data not there
 - Toxicologists would like to know which chemicals we should have potency factors for
- Better data on exposure/outcome intermediates
 - Act as exposure AND outcome
- Ensure chemical analyses overlap in NHANES to provide data on co-occurrence

High Impact/Long Timeframe

- Development of quantitative methods for measuring toxicants in complex mixtures
- Understanding mechanisms of disease
 - Some we already know better (e.g. endocrine, ADHD?)
- People need to be fluent in both toxicology and epidemiology
- High throughput screening for potential toxicants, placing compounds in groups

Low Impact/Short Timeframe

- Hierarchical models
 - Statisticians to build in uncertainty
- Anything but examining a single chemical at a time

Low Impact/Long Timeframe

- Status quo

Last thoughts

- Identifying exposure/outcome assays that can be used by toxicologists and epidemiologists is an important goal
- A place for genetic susceptibility in mixtures research
- Identified “cocktails”: relevant exposures, reference mixtures

Discussants

Mike Babich

Antonia Calafat

Caroline Dilworth

Dale Hattis

Irva Hertz-Piccioto

Kembra Howdeshell

Todd Jusko (rapporteur)

Freya Kamel

Marike Kolossa-Gehring

Andreas Kortenkamp

Jennifer McPartland

Susan Schantz

Paige Tolbert

Nigel Walker

Tom Webster (chairperson)

Beth Whelan