

New Research Approach at EPA's Office of Research and Development (ORD)

(personal views of Jane Ellen Simmons, not reflective of EPA policy)

- Goal is integrated research that addresses problems of broad national significance
 - Trans-disciplinary research
 - Sustainable solutions
 - Avoiding unintended consequences
 - Involving our stakeholders and partners at the beginning and throughout the process

Six Priority Program Areas

- Chemical Safety for Sustainability
- Safe and Sustainable Water Resources
- Air, Climate, Energy
- Sustainable and Healthy Communities
- Human Health Risk Assessment
- Homeland Security

Chemical Mixtures and/or Cumulative Risk are important components

Prospective Areas

- Accounting for exposures from multiple routes and multiple sources
- Grouping Contaminants
- Develop, refine and evaluate the next generation of integrated tools across the source to outcome continuum to enable effective, efficient and timely cumulative risk assessment and risk management decisions
- Provide high quality, timely support for high priority needs of Program Offices, Regions

Thoughts/ Research Needs

- For environmental mixtures of interest, defined or complex, lack of experimental mixtures data is the most frequent finding (and the same for exposure)
- Can't test our way out (but I have surely tried!!)
- Most of the approaches from yesterday hold considerable promise but have limited capacity – use them to develop user-friendly models that can be widely applied
- User friendly predictive modeling will enable extrapolation from the few data rich situations we can create to data poor or data unknown situations

Research Needs

- Rapid, efficient, multi-chemical methods to measure/monitor chemical exposures

(our limited understanding of the mixtures to which we are exposed limits our ability to understand health impacts)

- Consider both ecological and human health (especially important for cumulative risk)
- Develop approaches that allow us to focus on the chemical mixtures and chemical/stressor exposures that are of greatest concern (rapid screening, ToxCast, Tox21)

Research Needs Continued

- Include low dose/low effect region, with sufficient higher dose/higher effect doses to accurately estimate the slope and intercept
- In the low dose/low effect region, pay strict attention to power to detect effects
- Elucidate the assumptions and uncertainties in risk assessment methods evaluate them experimentally
- Can't test everything – develop general principles and predictive models

Research Needs Continued

- Develop approaches to understand the impact of the unidentified fraction of complex mixtures
- For cumulative risk, focus on the disease/chemical intersection
- Provide communities with estimates of their overall risk burden
 - to enable focus on those factors with the greatest impact on the health of the community
 - will require that agencies work together across regulatory mandates
 - 20% of pregnant women smoke