

Report 47: Exposure Science

Convener: Sacoby Wilson, Ph.D.

Brief History: With the advent of the release of the EPA cumulative risk assessment framework, The National Academy of Science report on risk assessment, coupled with the recently formed Institute of Medicine committee on exposure science; the NIEHS is perfectly positioned to be at the forefront of exposure science.

Discussion Highlights: Although the US EPA and NIEHS have completely different mission, there should be more collaborations between the two towards correcting the lack of good science that EPA is using to set policy on. Since children are considered to comprise one of the most vulnerable segments in our population, NIEHS needs to be at the forefront of discovery in exposure science based on the requirements the charge of the National Children's Study.

There is a need to profile background exposures in susceptible populations via the development of high throughput methodologies. This is necessary for because differential exposure determinations need to be made. We must link exposure to risk assessment for the purposes of conveying risk to the affected community. If NIEHS does this correctly, exposure science will translate the cumulative risk-assessment framework to informed changes in policy in this regard.

Recommendations: NIEHS-sponsored exposure science research will;

- 1) Model exposures based on real-life situations.
- 2) Encourage community partnerships that are linked to exposure biology programs aimed at developing techniques and methodologies for monitoring in affected communities.
- 3) Develop a more robust bio-monitoring program for the purposes of determining total body burden of exposure components (i.e. sensor development)
- 4) Develop oxidative stress biomarkers that will implicate the affected molecular pathways (i.e. ARE activation)
- 5) Stimulate the refinement of exposure science training programs
- 6) Lead to the application of Support Vector Machines to epidemiological study analysis towards identifying previously undescribed associations between exposure and disease.
- 7) Stimulate an evaluation of the relevant ethical issues involved in determining chemicals in blood

Discussion Participants:

Sacoby Wilson, Darryl B Hood, Secretary, Beverly Wright, Rob McConnell, Aubrey Miller, Cossette Serabjit-Singh, John Bucher, Richard Denison, John Froines and Elaine Hubal