



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
RESEARCH AND DEVELOPMENT

Pamela Shubat, Ph.D.
Chair, Children's Health Protection Advisory Committee
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Dear Dr. Shubat:

On behalf the Office of Research and Development (ORD), I would like to thank you and the entire Children's Health Protection Advisory Committee (CHPAC) for the insightful input provided to the EPA in your letter to Administrator Jackson dated December 20, 2011. We are gratified by your support for ORD's new research programs, their alignment under the EPA's Strategic Plan, and ORD's "Path Forward" approach with its overarching goal of enhancing sustainability. As emphasized in your letter, protecting children's health – and thus helping ensure the health of future generations – is fundamental to the concept of sustainability.

Children's health research is an integral part of the EPA's realigned research programs, and is a focus of cross-program collaboration. Together, the research programs address hazards at early life stages, exposure of sensitive populations to environmental stressors, assessment and management of children's health risks, and translation and communication of research findings. ORD's work also emphasizes metrics to track changes in children's health and evaluate the effectiveness of public health interventions.

I am pleased to inform you that updated Strategic Action Plans (StRAP) for all ORD programs have been provided to the EPA Science Advisory Board and are available on the EPA's website. These documents will help convey the evolution of our plans that has occurred since we met with CHPAC last summer. Children's health-related projects are included in the StRAPs, and ORD is developing a children's health "roadmap" to facilitate a cross walk of relevant program-specific and issue-specific projects across ORD. ORD's ongoing commitment to research on children's health, including ongoing collaboration with the National Institute of Environmental Health Sciences (NIEHS) through the Children's Environmental Health and Disease Prevention Research Centers (Children's Centers) Program, is also reflected in the EPA's component of the recently released 2013 President's Budget.

Your letter raises many important topics about which you would like more information, as well as questions specific to ORD programs. At the end of the letter, you identified the "three most pressing questions about research program implementation". We welcome the opportunity to respond to these questions here and look forward to having more in-depth and on-going exchanges at future CHPAC meetings.

1. *CHPAC: How can social determinants of health be explicitly and quantitatively incorporated into children's environmental health research?*

Response: ORD's research plans emphasize the importance of understanding and considering social determinants in risk assessment and remediation, as evidenced in research responsive to EPA's Environmental Justice Plan (Plan EJ 2014) and highlighted in a project in the Sustainable and Healthy Communities (SHC) research program called "Securing and Sustaining Environmental Justice." A discussion is planned for the next CHPAC meeting about emerging research on social determinants and environmental justice including: a new collaboration with the National Institute of Minority Health and Health Disparities (NIMHD); and, Science To Achieve Results (STAR) and in-house research on methods for cumulative risk assessment, including consideration of non-chemical stressors.

2. *CHPAC: How will health effects related to early lifestage (including preconception and prenatal periods) exposure and development be addressed/incorporated into high throughput screening?*

Response: ORD is working to incorporate knowledge of developmental exposures and outcomes into high throughput screening of chemicals in the Chemical Safety for Sustainability (CSS) research program. This research is occurring at multiple levels of complexity including development of *in vitro* assays, susceptibility biomarkers, and *in silico* models (e.g., the Virtual Embryo). In the near-term, this research can help prioritize large numbers of chemicals for targeted testing or lifestage-specific exposure assessment based on *in vitro* signatures that may be indicative of potential reproductive and developmental toxicity. Companion research in SHC is developing animal models to "ground-truth" results of *in vitro/in silico* predictions and evaluate potential epigenetic mechanisms. Finally, EPA-NIEHS supported Children's Centers and other STAR grantees are evaluating health outcomes subsequent to *in utero* exposures in longitudinal studies involving children and families in both urban and rural populations.

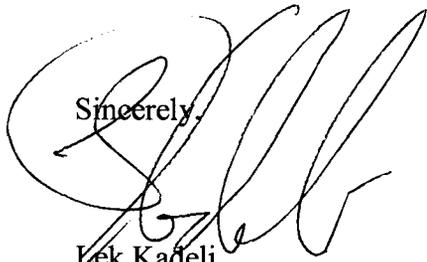
3. *CHPAC: How can the research that results from the new research strategies and ORD reorganization be implemented into intervention strategies and evaluated (i.e., what metrics should be used) to assess whether children's environmental health has improved as a result of ORD's new research direction?*

ORD Response: Measuring the effectiveness of research programs is an important emphasis across ORD's re-aligned research programs. Ongoing ORD research is developing metrics for evaluating the effectiveness of interventions designed to protect and promote children's health. For example: STAR grantees recently reported out on research on public health indicators, many of which relate to children (SHC workshop, September 2011, report under preparation). CSS researchers are working with the EPA Regional scientists to develop methods and models to evaluate PCB exposures in schools in order to recommend methods to local officials for the most appropriate and cost-effective remediation. These topics were also discussed at the ORD/Regional Science Workshop specifically focused on children's health protection (February, 2011).

We are also working on better biomarkers of exposure (for chemicals and asthmagens) as well as indicators of children's health, and we are evaluating these in cohort studies. Through the use of community-based case studies, we hope to translate our research into products to help inform decisions that will promote children's health in home and school settings as well as provide practical metrics to gauge the effectiveness of these decisions.

We also provide an **Appendix** with detailed responses to the issues and questions in your letter, many of which are specific to a given ORD program.

Thank you again for your letter. We look forward to continuing interactions with CHPAC in the years to come.

Sincerely,

Lek Kadeli
Acting Assistant Administrator

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