

April 11, 2013 Meeting of the Scientific Guidance Panel for Biomonitoring California

Summary of Panel Input and Recommendations

The Scientific Guidance Panel (SGP) for the California Environmental Contaminant Biomonitoring Program (also known as Biomonitoring California) met on April 11, 2013 in Oakland. This document briefly summarizes the Panel's input and recommendations on each agenda item and related public comments. To view or download the presentations, other meeting materials and the full transcript, visit the [April 2013 SGP meeting page](#).

Morning Session and Panel Discussion with Guest Speakers

- NIEHS Strategies in Biomonitoring and Low Dose Exposures
[Presentation: Linda Birnbaum, Ph.D.](#), D.A.B.T., A.T.S., *Director, National Institute of Environmental Health Sciences (NIEHS) and National Toxicology Program*
- New Findings on Flame Retardants in Biospecimens, Dust, and Consumer Products
[Presentation: Heather Stapleton, Ph.D.](#), *Associate Professor, Duke University*

The Panel and audience had a wide-ranging discussion with the guest speakers. Refer to the transcript for the complete discussion. Topics of discussion included:

- *Initiatives related to workers and low dose exposures.* Panel members have shown a longstanding interest in biomonitoring in worker populations. Dr. Birnbaum described partnerships between NIEHS and NIOSH (National Institute of Occupational Safety and Health). One area of collaboration is research on the safety of nanomaterials.
- *Correlation between serum levels and handwipe results for certain chemicals.* Dr. Stapleton's research showed a good correlation between serum levels of flame retardants and levels measured via handwipes. Handwipes are of particular value for toddlers, who have extensive hand-to-mouth activity. Handwipes are also of value in assessing exposure from touching products that contain chemicals of concern; for example, to evaluate the potential for direct partitioning of flame retardants from a couch or other product to surface soils on the skin. Research on the equilibration of dioxin in the cuticle layer of a plant was also discussed. Equilibration between lipophilic chemicals in the environment and the lipid layer in the skin may occur with no direct contact between a person and a product containing the chemicals. However, differences between the front and back of the hand suggest that direct contact does influence dermal levels.
- *Potential role for biomonitoring in facilitating better, quicker protections from toxic*

chemical exposures. Biomonitoring research feeds into the research and regulatory agenda on the state and federal level. Biomonitoring is also of particular value in showing the effect of regulatory or voluntary actions by demonstrating the decline in measured levels of chemicals of concern. Dr. Birnbaum noted that screening and prioritizing new chemicals as they begin to come on the market will improve identification of chemicals of concern. This will facilitate development of approaches to detect new chemicals of concern in the environment before they are found in people.

- *High throughput screening to identify new chemicals of concern.* The SGP has advised Biomonitoring California to track emerging chemicals of concern as potential candidates for biomonitoring. There have been considerable advances in high throughput screening, which allows large numbers of chemicals to be tested quickly and provides data for prioritizing chemicals of concern. NIEHS is also working on “mid-throughput” types of systems such as *C.elegans*, which has a well-defined genome. Another important system is the zebrafish, a vertebrate system with a short lifespan that can be used to study developmental changes.
- *The exposome and how to monitor it.* One description of the exposome is “the measure of all the exposures of an individual in a lifetime and how those exposures relate to health.”¹ The exposome is one of eight cross-institute federal efforts identified as high priorities. The exposome is extremely complicated and needs to be defined in a way that we can begin to use it. One important focus will be understanding pathways of exposure, because that’s needed for eventual intervention on exposures to chemicals of concern. NIEHS and the U.S. Environmental Protection Agency will be involved in the initiatives to better understand the exposome and are likely to conduct workshops.
- *Availability of data on chemicals of concern.* The lack of adequate toxicity testing is a barrier to identifying chemicals of concern as possible candidates for biomonitoring and other purposes. Another barrier that was discussed is the difficulty of harmonizing efforts across different U.S. federal agencies. The European Chemicals Agency (ECHA) is collecting a large amount of toxicity data under the REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) regulation, but is not able to share those data with the U.S. EPA. ECHA develops data summaries that can be accessed by U.S. state and federal agencies.

¹ From <http://www.cdc.gov/niosh/topics/exposome/>

Public comment

Davis Baltz of Commonweal thanked Dr. Birnbaum and Dr. Stapleton for their work and leadership in stimulating research in important new areas. He noted the importance of Dr. Stapleton's recent study on flame retardants in couches in aiding efforts to revise Technical Bulletin 117 (TB 117, California's furniture flammability standard). He also expressed his support for adding *p,p'*-bisphenols (a later agenda item) to the priority list.

Nancy Buermeyer of the Breast Cancer Fund thanked the Panel and staff for inviting the guest speakers. She expressed her appreciation to Dr. Birnbaum for her role in the recent report put out by the Interagency Breast Cancer and Environmental Research Coordinating Committee, called [Breast Cancer and the Environment, Prioritizing Prevention](#). Ms. Buermeyer noted that the report highlighted the importance of biomonitoring in investigating chemical exposures and prioritizing chemicals to be reviewed.

Program Update and Future Directions

[Presentation by Michael J. DiBartolomeis, Ph.D., D.A.B.T.](#) *Chief of the Exposure Assessment Section, California Department of Public Health (CDPH) and Lead of Biomonitoring California*

Panel members:

- Encouraged regular communication and interaction between Biomonitoring California and other state programs, such as the Safer Consumer Products program and Environmental Health Tracking.
- Discussed the intersection of biomonitoring with Environmental Justice activities and encouraged continued community involvement in the Program.
- Encouraged the Program to be transparent about the lack of state resources to carry out the core mandate to biomonitor a representative sampling of the California population.
- Provided impressions of the results template prepared by Program staff and suggested:
 - When biomonitoring results are posted, set up ways to evaluate how well the public understands the results tables and how often the results are accessed on-line.
 - Accompanying material, such as short summaries of project findings, will also be helpful.
 - Reviewing the types of summary statistics provided (for example, 95th percentile vs. 99th percentile) and thinking about the various ways people will use this information. [Program staff noted that this is a flexible template that can be tailored to each data set.]

Public comment:

Renée Sharp of the Environmental Working Group expressed her enthusiasm about the future potential of the Program to identify unknowns.

Diane Graham, an analytical chemist at Keller & Heckman speaking as a member of the public, expressed her support for the Program's efforts to communicate results to the public.

Laboratory Update and Recent Biomonitoring California Results

[Presentation by Myrto Petreas, Ph.D., M.P.H.](#), *Chief, Environmental Chemistry Branch, Environmental Chemistry Laboratory, Department of Toxic Substances Control (DTSC)*

[Presentation by Jianwen She, Ph.D.](#), *Chief, Biochemistry Section in the Environmental Health Laboratory Branch at CDPH*

Panel members:

- Highlighted the expected new capacity of the Program to analyze for unknowns.
- Suggested that the Program consider the potential impact of evaporation for samples from the Genetic Disease Screening Program.
- Supported presentation of data on a wet basis and a lipid-adjusted basis.
- Discussed the interpretation of results for polycyclic aromatic hydrocarbons (PAHs) in firefighters, including factors such as half-life, ongoing background exposure, and relevance of results to firefighting events.

Launch of Revised Biomonitoring California Website

[Presentation by Amy Dunn, M.P.H. and Laurel Plummer, Ph.D.](#), *Safer Alternatives Assessment and Biomonitoring Section, Office of Environmental Health Hazard Assessment (OEHHA)*

Panel members provided initial impressions on the website and suggestions, including:

- Adding links to other California chemical management programs such as the Safe Cosmetics Program, Safer Consumer Products program, and Cal/OSHA.
- Developing resources and information targeted to workers.
- Linking to more outside fact sheets and documents.
- Highlighting OEHHA chemical-specific documents.
- Working with community groups as resources for testing and input. Ask for information on community contacts from the Environmental Health Tracking Program or the Occupational Health Branch .

Potential Priority Chemicals

[Presentation by Gail Krowech, Ph.D.](#), Staff Toxicologist, Safer Alternatives Assessment and Biomonitoring Section, OEHHA

Documents:

[Non-halogenated Aromatic Phosphates](#)

[p,p'-Bisphenols and Diglycidyl Ethers of p,p'-Bisphenols](#)

The Panel:

- Voted unanimously to recommend adding “non-halogenated aromatic phosphates” to the list of priority chemicals for Biomonitoring California.
- Voted unanimously to recommend adding “p,p'-bisphenols” to the list of priority chemicals for Biomonitoring California.
- Voted unanimously to recommend adding “diglycidyl ethers of p,p'-bisphenols” to the list of priority chemicals for Biomonitoring California.

Panel members provided input on possible candidates for future consideration as potential priority or potential designated chemicals:

- Cobalt, which could be of interest because it is used in hip implants
- Chromium
- Other substitutes for BPA (other than p,p'-bisphenols)
- N-Methylpyrrolidone
- Organotins

The importance of continued research on a target analyte for diesel exhaust was also noted by Panel members.

Public comment:

Nancy Buermeyer of the Breast Cancer Fund supported biomonitoring possible BPA replacements to investigate exposure to these chemicals. She also suggested considering potential priority chemicals that could be found in personal care products, such as toluene (nail polish).

Renée Sharp, of the Environmental Working Group, noted the importance of following the rise of replacement compounds for both BPA and flame retardants.

