

Report to Scientific Guidance Panel



Jianwen She, Ph.D.

**California Department of Public Health
Environmental Health Laboratory**

Sacramento, CA

March 3, 2016

Overview

- Staff Changes**
- Method Updates**
- Ongoing Projects**
- Recent Publications**

Staff Changes

Visiting Scholar:

- Ms. Su Zhang

New Hire:

- Dr. Yu-Chen Chang

APHL Fellow: Interviewing

State Limited-Term Vacancies:

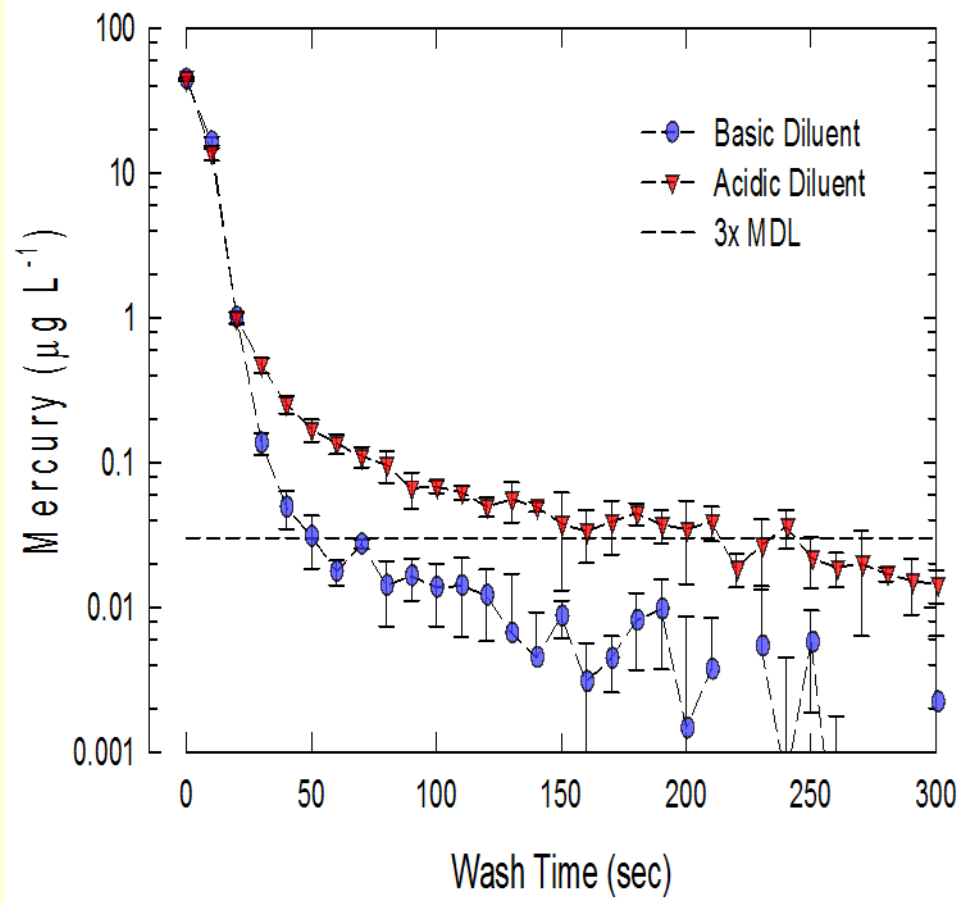
- Research Scientist I
- Research Scientist II

Method Updates

- Urine Metals**
- Organophosphate Flame Retardants (OPFRs)**
- BPA Analogs**
- Non-Targeted Screening**

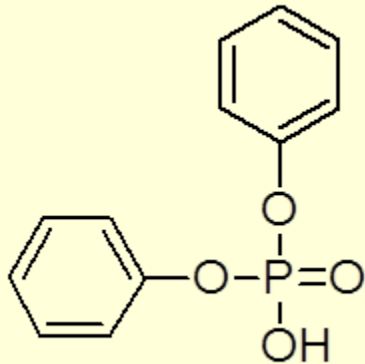
Urine Metals

- Expanded the list of analytes to 13 metals
- Lowered detection limit
- Shortened mercury washout time

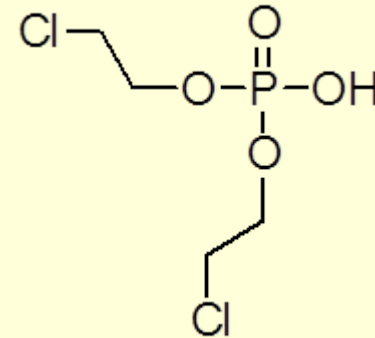


OP Flame Retardants Method

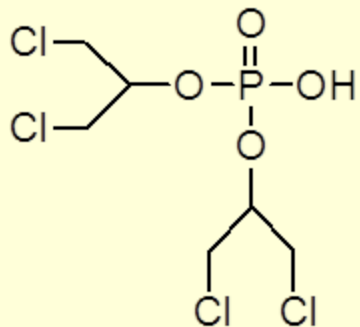
Diphenyl phosphate (DPhP)



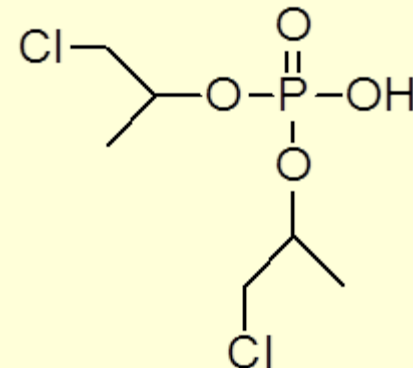
Bis(2-chloroethyl)phosphate (BCEP)



Bis(1,3-dichloro-2-propyl) phosphate (BDCiPP)

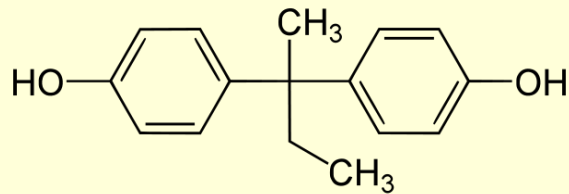


Bis(2-chloroisopropyl) phosphate (BCiPP)

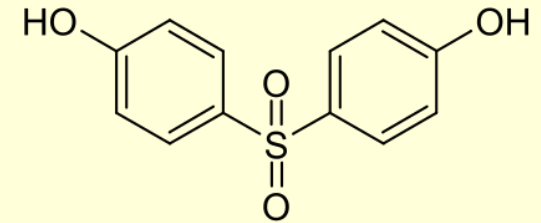


BPA Analogs*

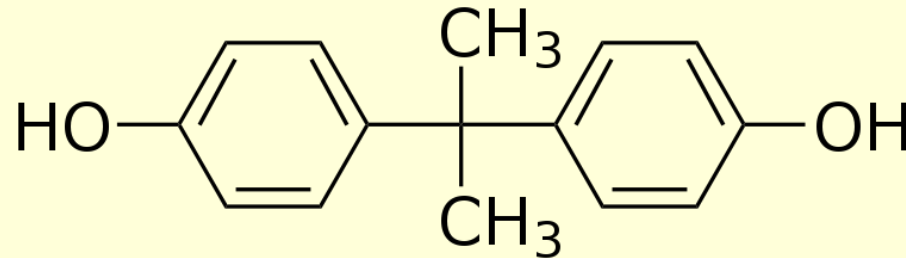
BPB



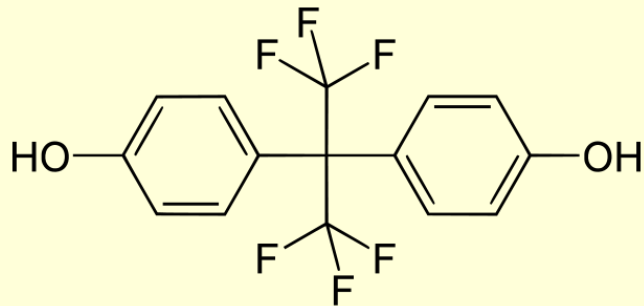
BPS



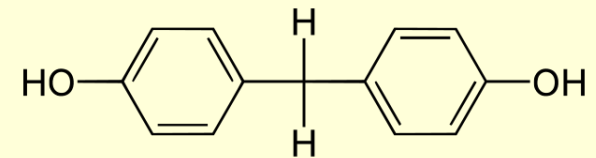
BPA



BPAF



BPF



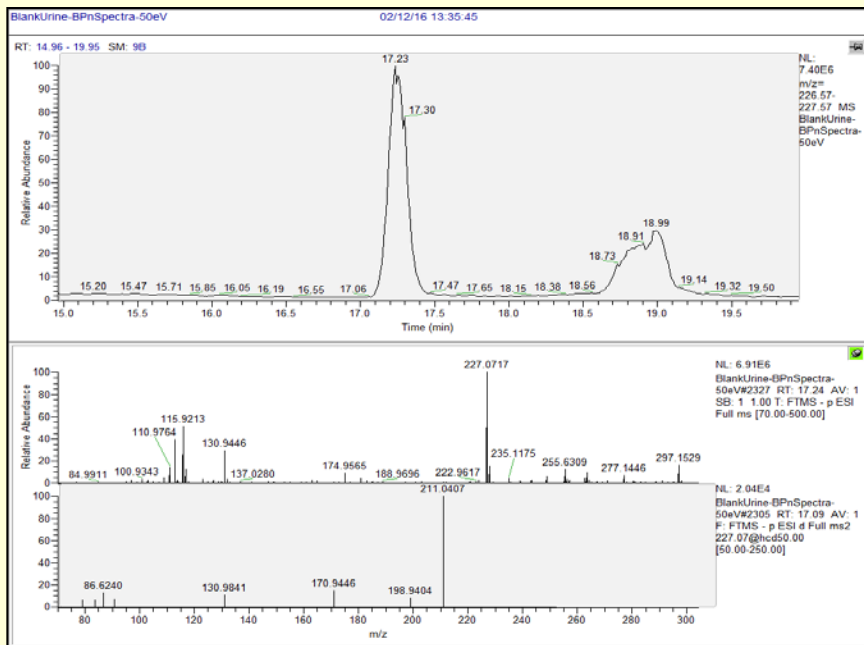
*p,p'-Bisphenols

Non-Targeted Screening

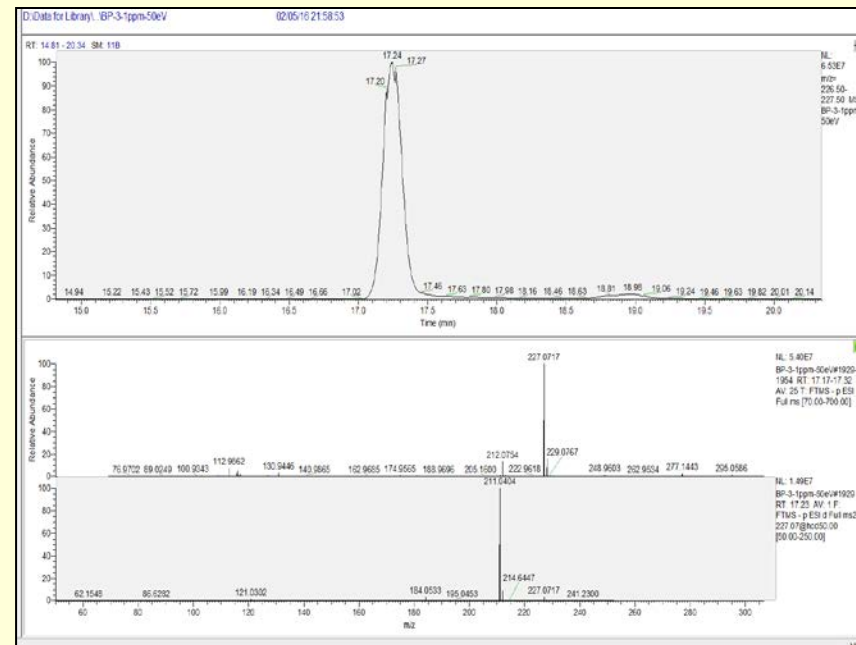
Detection of Structurally Related Compounds

- Model chemical: *Benzophenones in urine*
- 17 compounds matched to in-house database based on *exact masses, isotopic patterns, full scan spectra and MS/MS Spectra*
- Confirmed with in-house mass spectra library of commercially available reference materials

Detection and Confirmation of Benzophenone-3 in Urine Sample



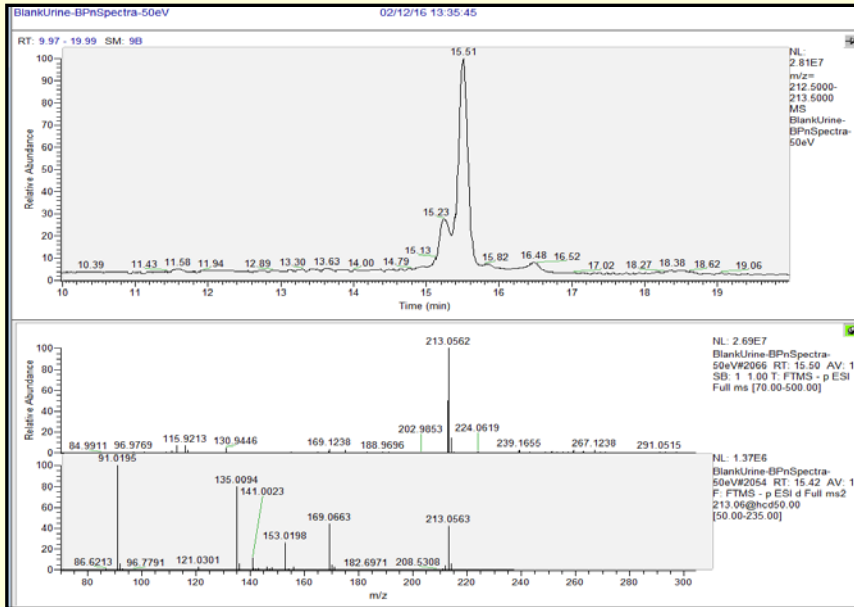
Urine Sample



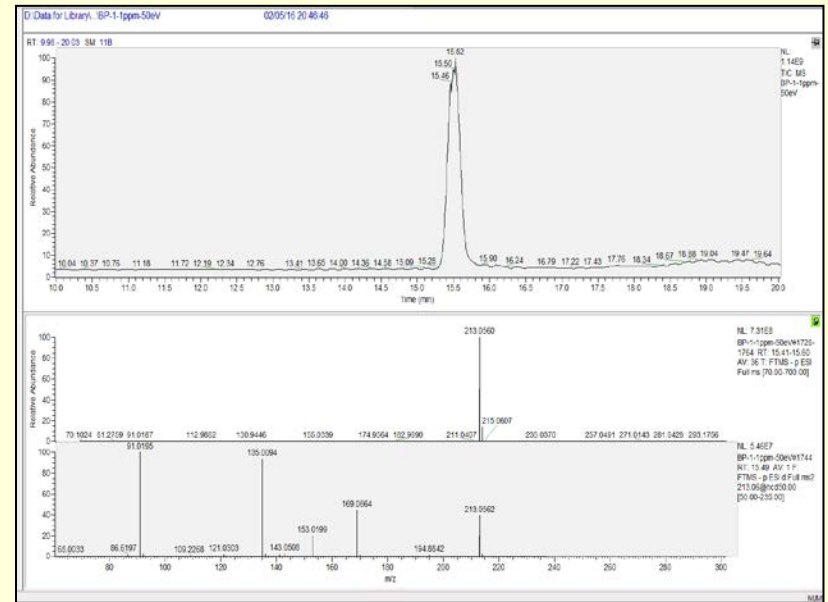
Reference Material

-- XIC of m/z226.57-227.57 (top), full scan spectra of target peak (middle) and MS/MS spectra (bottom) of benzophenone-3 (oxybenzone)

Detection and Confirmation of Benzophenone-1 in a Urine Sample



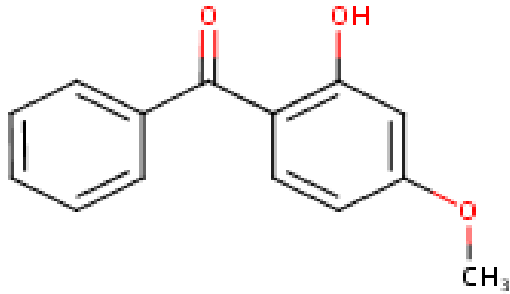
Urine Sample



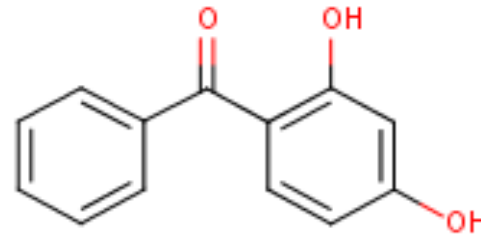
Reference Material

-- XIC of m/z212.50-213.50 (top), full scan spectra of target peak (middle) and MS/MS spectra (bottom) of benzophenone-1 (2,4-dihydroxybenzophenone)

Chemical Structures of BP-1 and BP-3



Benzophenone-3



Benzophenone-1

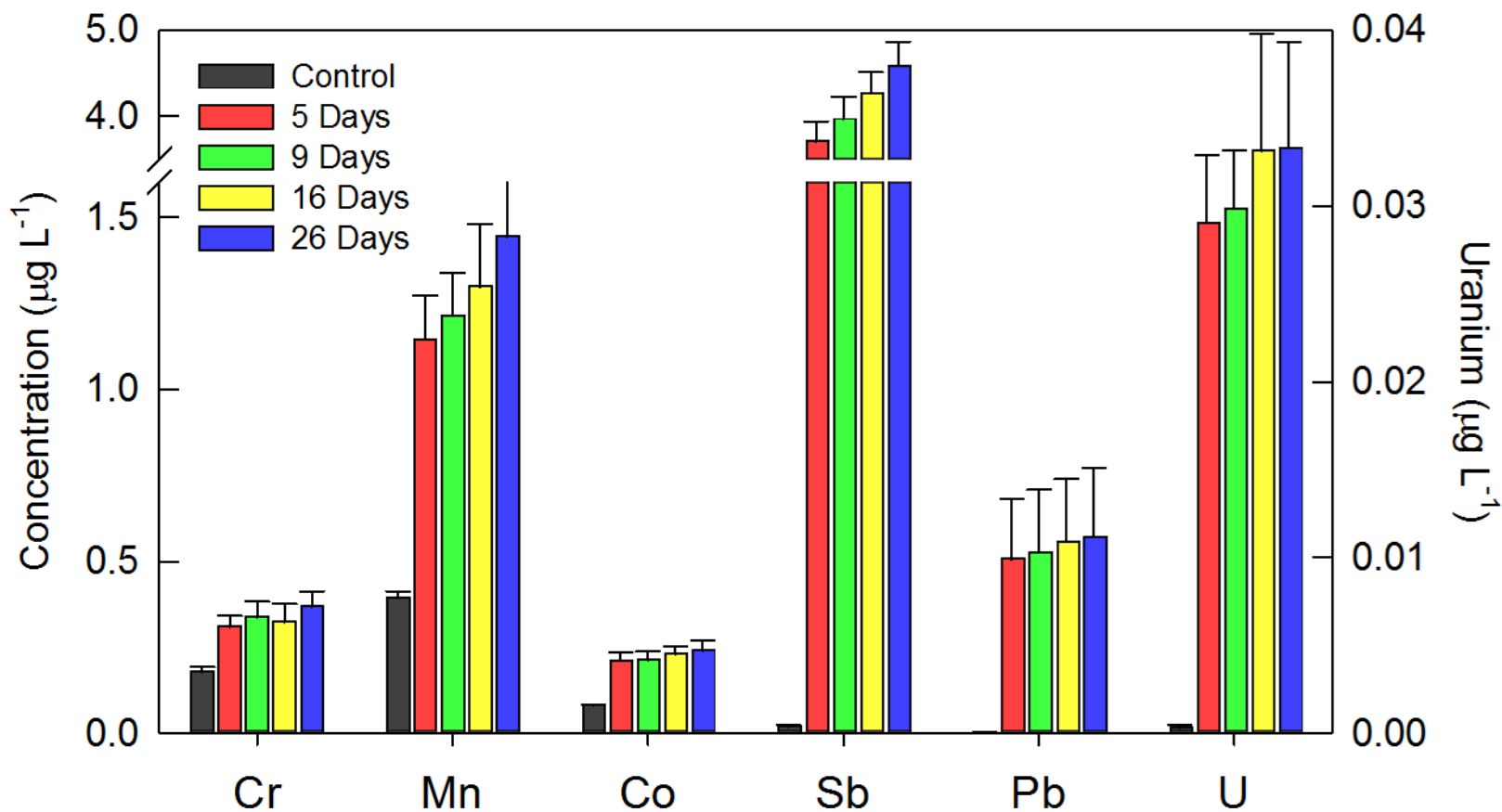
Project Updates

- Pregnancy, Environment, and Lifestyle Study (PETALS)
- Measuring Analytes in Maternal Archived Samples (MAMAS)
- Traffic Related Air Pollutants Study (TRAPs)

PETALS

STUDY	COLLABORATORS	ANALYSES/ SAMPLE #	STATUS
Pregnancy Environment & Lifestyle Study (PETALS)	Kaiser Permanente Northern California <i>(Assiamira Ferrara, MD, PhD)</i>	BPA, BP-3, triclosan & creatinine in urine n=600/yr (3 yrs)	<ul style="list-style-type: none"> ▪ 414 samples received to date ▪ All analyses completed ▪ All data reported

MAMAS: Metals Contamination



Traffic Related Air Pollutants Study (TRAPs)



Principal Investigator: Professor Yifang Zhu, Department of Environmental Health Sciences, UCLA

- Objectives:
 - Investigate exposures to *PAHs* and *particulate matter*, and assess *lipid peroxidation* in Los Angeles taxi drivers
 - Assess two exposure mitigation strategies: *closing vehicle windows vs. high efficiency cabin air filters*
- EHL: Measured concentrations of *nine hydroxy-PAHs* and *malondialdehyde* in pre- and post-shift urine samples from taxi drivers

Diesel Biomarker Method Development

- SGP discussions
 - Presentation by Dr. Peter Flessel, December 2008
 - Presentations by Dr. Chris Simpson and Dr. Melanie Marty, November 2014

- EHL received nitro-PAH standards and technical advice from Dr. Chris Simpson
 - On-site visit planned in the next year

- EHL is recruiting a scientist to develop this capability

Recent Publications

- YuFeng Guan, Bin Zhao, and Jianwen She, Biomonitoring program status, challenges and perspectives. *Environ Health Perspect* 3: 3-5 (2015, Chinese edition).
- RuiFang Fan, DongLi Wang, Jianwen She, Method development for the simultaneous analysis of *trans, trans*-muconic acid, 1,2-dihydroxybenzene, *S*-phenylmercapturic acid and *S*-benzylmercapturic acid in human urine by liquid chromatography/tandem mass spectrometry. *Analytical Methods* 7: 573-580 (2015).
- DaShen Lu, Yuanjie Lin, Chao Feng, Dongli Wang, Jianwen She, Haitao Shen, Guoquan Wang and Zhijun Zhou, Levels of polychlorinated dibenzo-*p*-dioxins/furans (PCDD/Fs) and dioxin-like polychlorinated biphenyls (DL-PCBs) in breast milk in Shanghai, China: A temporal upward trend. *Chemosphere* 137: 14-24 (2015).
- Jed M. Waldman, Qi Gavin, Meredith Anderson, Sara Hoover, Josephine Alvaran, Ho Sai Simon Ip, Laura Fenster, Nerissa T. Wu, Gail Krowech, Laurel Plummer, Leslie Israel, Rupali Das, Jianwen She, Exposures to environmental phenols in Southern California firefighters and findings of elevated urinary benzophenone-3 levels. *Environ Int* 88: 281-287 (2016).
- Kim G. Harley, Katherine Kogut, Daniel S. Madrigal, Maritza Cardenas, Irene A. Vera, Gonzalo Meza-Alfaro, Jianwen She, Qi Gavin, Rana Zahedi, Asa Bradman, Brenda Eskenazi, and Kimberly L. Parra, Reducing Phthalate, Paraben, and Phenol Exposure from Personal Care Products in Adolescent Girls: Findings from the HERMOSA Intervention Study. *Environ Health Perspect* (In press).