Report to Scientific Guidance Panel

Jianwen She, Ph.D.

California Department of Public Health

Environmental Health Laboratory

Oakland, CA

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BIOMONITORING CALIFORNIA

Overview

- Staff Changes
- Method Updates
- Projects: Completed and Ongoing
- Future Work

Staff Changes

- Thank you and farewell to
  - Dr. Yu-chen Chang
  - Alanna Viegas
- Welcome
  - Long Nguyen
  - Jie Jiang & Dr. Yufeng Guan (visiting scholars)

Method Updates

- **Phthalate Metabolites**
  - Mono-ethyl phthalate (mEP)
  - Mono-butyl phthalate (mBP)
  - Mono-benzyl phthalate (mBzP)
  - Mono-3-carboxypropyl phthalate (mCPP)
  - Mono-(2-ethyl-5-carboxypentyl) phthalate (mECPP)
  - Mono-cyclohexyl phthalate (mCHP)
  - ***Mono-2-ethylhexyl phthalate (mEHP)***
  - ***Mono-(2-ethyl-5-hydroxyhexyl) phthalate (mEHHP)***
  - ***Mono-(2-ethyl-5-oxohexyl) phthalate (mEOHP)***
  - ***Mono-isobutyl phthalate (miBP)***

Phthalate Metabolites in Urine

Parent Compound	*Abbreviation*	**Analyte Name**	Abbreviation
Diethyl phthalate	*DEP*	Mono-ethyl phthalate	mEP
Di-n-octyl phthalate	*DOP*	Mono-(3-carboxypropyl) phthalate	mCPP
Dibutyl phthalate	*DBP*	Mono-(3-carboxypropyl) phthalate	mCPP
		Mono-*n* -butyl phthalate	mBP
Benzylbutyl phthalate	*BzBP*	Mono-n-butyl phthalate	mBP
		Mono-benzyl phthalate	mBzP
Dicyclohexyl phthalate	*DCHP*	Mono-cyclohexyl phthalate	mCHP
Di-2-ethylhexyl phthalate	*DEHP*	Mono-(2-ethyl-5-carboxypentyl) phthalate	mECPP
		Mono-(2-ethyl-5-hydroxyhexyl)phthalate	**mEHHP**
		Mono-(2-ethyl-5-oxohexyl) phthalate	**mEOHP**
		Mono-2-ethylhexyl phthalate	**mEHP**
Di-isobutyl phthalate	*DiBP*	**Mono- isobutyl phthalate**	**miBP**

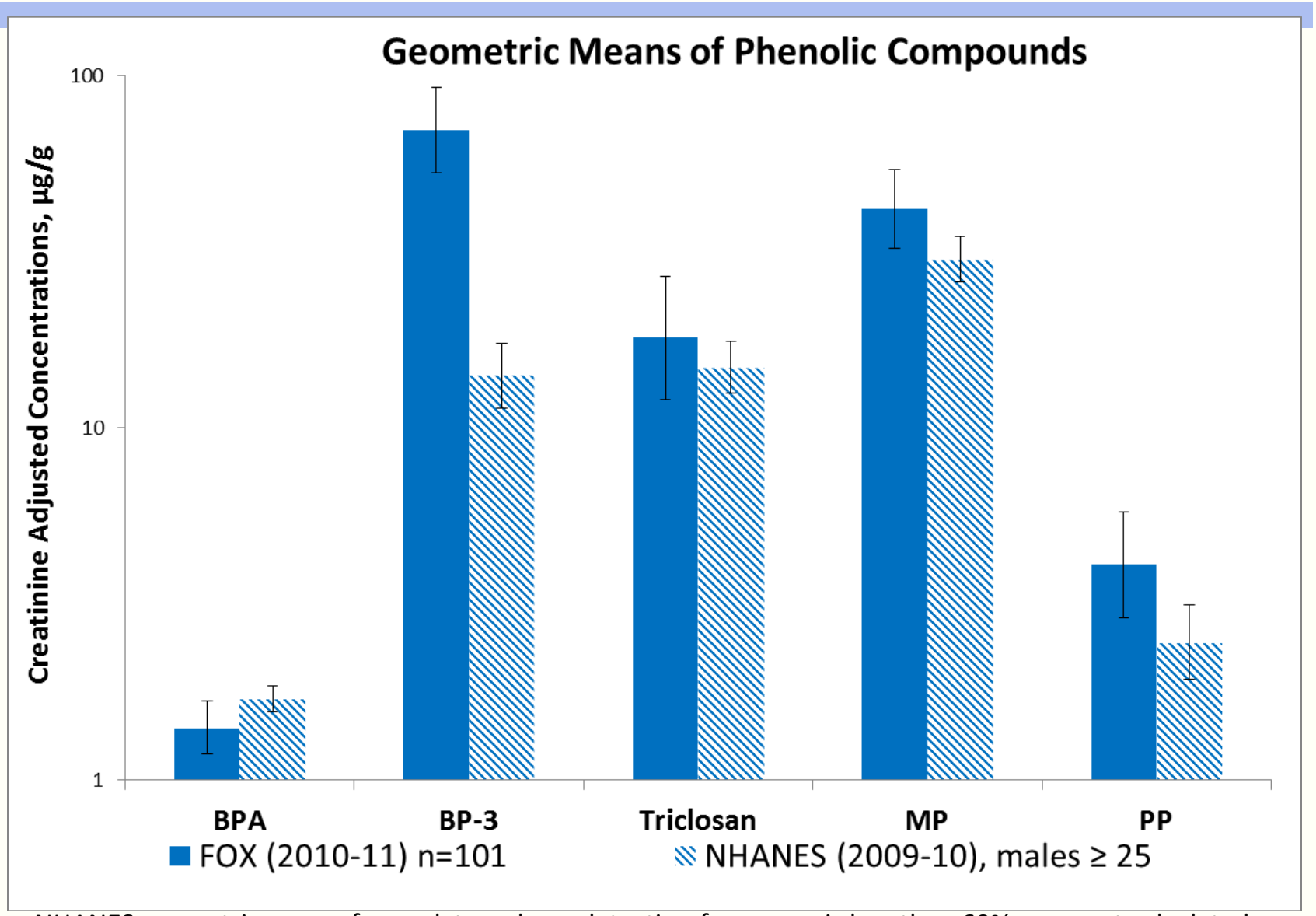
Method Updates

- **Urine Metals**
  - Arsenic
  - Cadmium
  - Mercury
  - Manganese
  - Cobalt
  - Molybdenum
  - Tungsten
  - Thallium
  - Uranium
  - Chromium

Method Updates

- **Organophosphate Flame Retardants**
  - MS/MS detection method developed; HPLC separation method in progress
- **Bisphenol A Analogs**
  - Method developed and under validation
- **Unknown Screening**
  - Toxic Chemical Finder (TCF) database developed; application is being testing against known compounds

FOX Results: Environmental Phenols



NHANES geometric means for analytes whose detection frequency is less than 60% were not calculated.

HERMOSA Project Update

Health & Environmental Research in Make-up of Salinas Adolescents

- Urinary concentrations of several phthalates and phenols were lower in post-intervention samples compared to pre-intervention samples.

Analyte	Use	Pre-intervention Geometric Mean (ng/mL)	Post-intervention Geometric Mean (ng/mL)	P-value
Diethyl phthalate	Fragrance carrier, plasticizer	78.2	56.4	<0.001
Triclosan	Antibacterial in liquid soap & consumer products	9.5	6.1	<0.01
Benzophenone-3	UV filter in sunscreens & plastics	173	113	<0.001
Methyl paraben	Preservative in personal care products	77.4	43.2	<0.01

- Future analyses will examine associations between use of specific personal care products and urinary phthalate, triclosan, benzophenone-3, and paraben concentrations.

Principal Investigator, Dr. Kim Harley, UC Berkeley

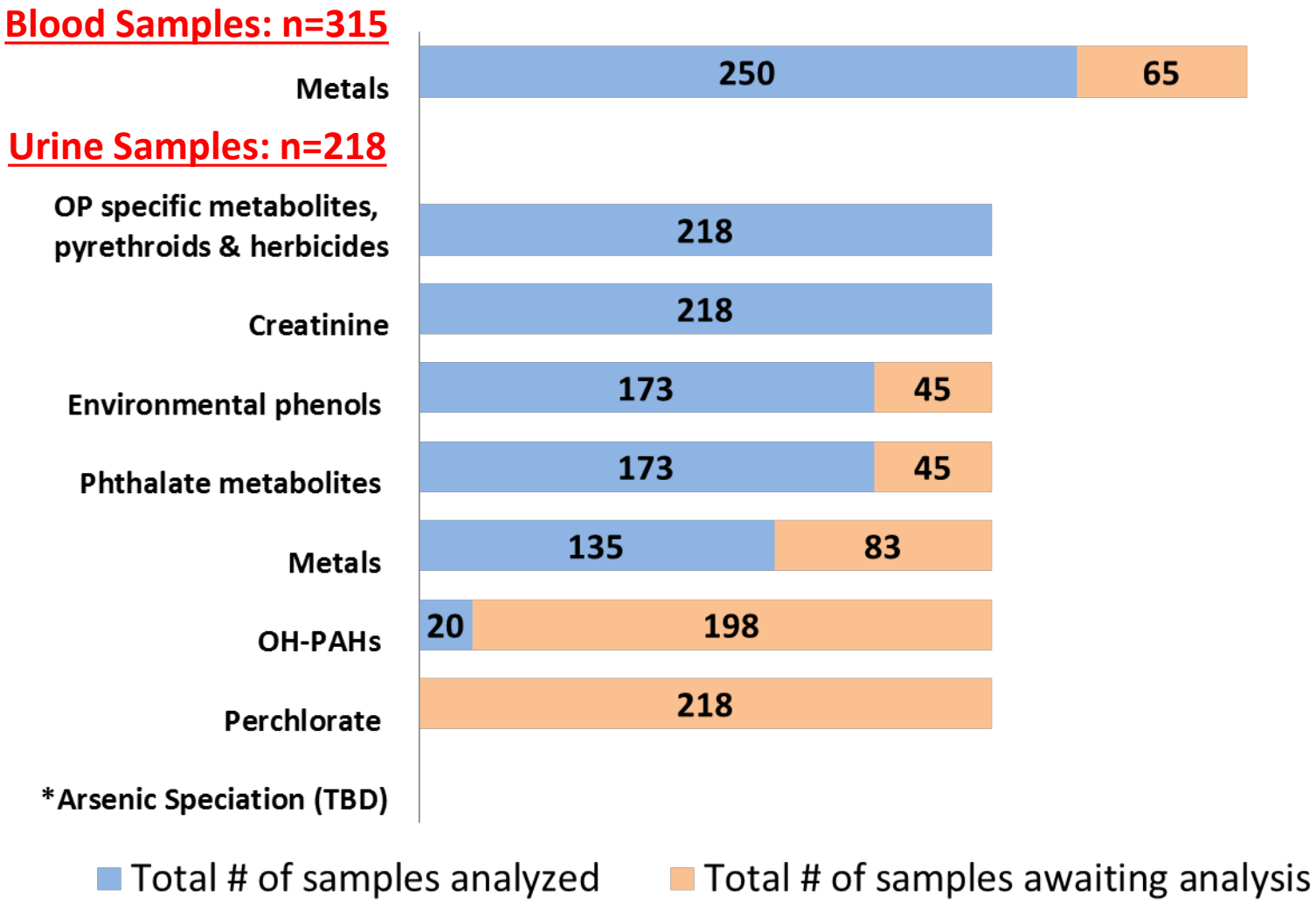
Los Angeles Taxi Driver Study

- Laboratory collaboration with the University of California Los Angeles (UCLA) Environmental Health Sciences Department

  Principal Investigator, Dr. Yifang Zhu

- Determination of PAH exposures in non-smoking taxi drivers from the Greater Los Angeles Area
- Multiple urine samples collected from 22 participants before and after work shifts; samples also collected from individuals with low exposure to traffic
- Total of 232 samples analyzed for OH-PAHs and creatinine

Expanded BEST Analysis Update



*Samples are only analyzed if total urinary arsenic levels are ≥20µg/L

Orange County Mercury Cases

- 20 month old with symptoms of severe mercury poisoning identified in Orange County; mother used skin-lightening cream from Mexico
- Contaminated cream contained 38,000 ppm of mercury
- FDA regulatory limit for mercury in skin creams is less <1 ppm
- Additional 6 households and 45 individuals found to be exposed to mercury
- EHL requested to analyze urine in symptomatic residents without health insurance

COUNTY OF ORANGE - HEALTH CARE AGENCY

PRESS RELEASE

Mercury Poisoning Linked to Use of Face Cream

Envenenamiento por mercurio relacionado con el uso de cremas faciales

The Orange County Health Care Agency warns against the use of face creams that appear to be homemade or imported from Mexico due to potentially high levels of mercury. One case of mercury poisoning associated with use of these products has recently been identified in Orange County, and several others are under investigation.

The face cream claims to lighten skin, fade freckles and age spots, and treat wrinkles and acne. Air samples taken from the cream had more than 50,000 times the safe limit. The U.S. Food and Drug Administration does not allow mercury in drugs or cosmetics, expect under very specific conditions which these products do not meet.

Orange County Mercury Cases

- 9 urine samples analyzed to date
- All homes decontaminated by the US Environmental Protection Agency (US EPA) and Department of Toxic Substances Control (DTSC)
- Follow-up analyses to be conducted for anyone with symptoms and Hg levels >5 μg/L
- Mexican-American Hg Levels (National Health and Nutrition Examination Survey, Survey years 2011-2012):
  - Geometric mean = 0.30 μg/L
  - 95th percentile = 1.83 μg/L

Gender	Age	Result (μg/L)
M	41	0.22
M	37	1.09
M	30	1.27
M	32	2.54
F	63	5.95
M	39	11.5
F	36	14.9
F	35	21.0
F	36	44.0

Future Work

- Complete method development and validation
- Laboratory publications
- Complete Expanded BEST analyses
- Pending collaboration with Kaiser Permanente Northern California Division of Research (KPNC)
  - Principal Investigator: Assiamira Ferrara, MD, PhD
  - Urinary phenol analyses for women with and without gestational diabetes