Report to Scientific Guidance Panel

Jianwen She, Ph.D.
California Department of Public Health
Environmental Health Laboratory

Oakland, CA
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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-2-ethylhexyl phthalate (mEHP)
  - Mono-(2-ethyl-5-oxohexyl) phthalate (mEOHP)
  - Mono-3-carboxypropyl phthalate (mCPP)
  - Mono-(2-ethyl-5-carboxypentyl) phthalate (mECPP)
  - Mono-cyclohexyl phthalate (mCHP)
  - Mono-(2-ethyl-5-hydroxyhexyl) phthalate (mEHHP)
  - Mono-isobutyl phthalate (miBP)
## Phthalate Metabolites in Urine

<table>
<thead>
<tr>
<th>Parent Compound</th>
<th>Abbreviation</th>
<th>Analyte Name</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethyl phthalate</td>
<td>DEP</td>
<td>Mono-ethyl phthalate</td>
<td>mEP</td>
</tr>
<tr>
<td>Di-n-octyl phthalate</td>
<td>DOP</td>
<td>Mono-(3-carboxypropyl) phthalate</td>
<td>mCPP</td>
</tr>
<tr>
<td>Dibutyl phthalate</td>
<td>DBP</td>
<td>Mono-(3-carboxypropyl) phthalate</td>
<td>mCPP</td>
</tr>
<tr>
<td>Dibutyl phthalate</td>
<td>DBP</td>
<td>Mono-n-butyl phthalate</td>
<td>mBP</td>
</tr>
<tr>
<td>Benzylbutyl phthalate</td>
<td>BzBP</td>
<td>Mono-n-butyl phthalate</td>
<td>mBP</td>
</tr>
<tr>
<td>Benzylbutyl phthalate</td>
<td>BzBP</td>
<td>Mono-benzyl phthalate</td>
<td>mBzP</td>
</tr>
<tr>
<td>Dicyclohexyl phthalate</td>
<td>DCHP</td>
<td>Mono-cyclohexyl phthalate</td>
<td>mCHP</td>
</tr>
<tr>
<td>Di-2-ethylhexyl phthalate</td>
<td>DEHP</td>
<td>Mono-(2-ethyl-5-carboxypentyl) phthalate</td>
<td>mECP</td>
</tr>
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<td>DEHP</td>
<td>Mono-2-ethylhexyl phthalate</td>
<td>mEHP</td>
</tr>
<tr>
<td>Di-isobutyl phthalate</td>
<td>DiBP</td>
<td>Mono- isobutyl phthalate</td>
<td>miBP</td>
</tr>
</tbody>
</table>
Method Updates

- **Urine Metals**
  - Arsenic
  - Mercury
  - Cobalt
  - Tungsten
  - Uranium
  - Cadmium
  - Manganese
  - Molybdenum
  - Thallium
  - 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 tested against known compounds
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.

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

- 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

- **Blood Samples: n=315**
  - Metals: 250
  - Urine Samples: n=218
  - OP specific metabolites, pyrethroids & herbicides: 218
  - Creatinine: 218
  - Environmental phenols: 173
  - Phthalate metabolites: 173
  - Metals: 135
  - OH-PAHs: 20
  - Perchlorate: 218

*Arsenic Speciation (TBD)*

- **Total # of samples analyzed**
- **Total # of samples awaiting analysis**

*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
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

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Result (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>41</td>
<td>0.22</td>
</tr>
<tr>
<td>M</td>
<td>37</td>
<td>1.09</td>
</tr>
<tr>
<td>M</td>
<td>30</td>
<td>1.27</td>
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<tr>
<td>M</td>
<td>32</td>
<td>2.54</td>
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<tr>
<td>F</td>
<td>63</td>
<td>5.95</td>
</tr>
<tr>
<td>M</td>
<td>39</td>
<td>11.5</td>
</tr>
<tr>
<td>F</td>
<td>36</td>
<td>14.9</td>
</tr>
<tr>
<td>F</td>
<td>35</td>
<td>21.0</td>
</tr>
<tr>
<td>F</td>
<td>36</td>
<td>44.0</td>
</tr>
</tbody>
</table>
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