CDPH Laboratory Update

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Environmental Health Laboratory

Report to Scientific Guidance Panel
Oakland, CA
March 16, 2012
Staff Changes

New Staff

• Sample Management Specialist – Alanna Viegas
  Hired from a biotechnology company

• Research Scientist II – Wei Zou
  Hired from DTSC; experienced in organic and inorganic analysis

• Research Scientist Supervisor I – Ryszard Gajek
  Promoted from EHL lead testing program

Farewell & Thanks to

Visiting professor from PRC - RuiFang Fan
Methods

• In production

• Under validation

• Under development
In Production

- Metals in blood
  - Hg, Cd, Pb, Mn
- Phthalate metabolites
  - mEP, mBP, mBzP, mCPP, mECPP, mCHP
- Common metabolites of organophosphate pesticides – DAPs
  - DMTP, DMDTP, DEP, DEDTP
- Chlorpyrifos metabolite
  - TCPy
- Pyrethroid metabolite
  - 3-PBA
- Environmental phenols (13 compounds)
- Hydroxy PAHs (10 compounds)
- Creatinine
Under Validation

- Arsenic speciation in urine by LC-ICP-MS
- Metal panel in urine by ICP-MS
- DAPs by LC-MS
- OP specific metabolites and pyrethroid metabolites by LC-MS
- PBDEs and PCBs in dried blood spot and low volume of blood sample
## Arsenic Speciation

<table>
<thead>
<tr>
<th>Analytes</th>
<th>MDL (µg/L)</th>
<th>Stability (CV%)</th>
<th>Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenobetaine</td>
<td>0.169</td>
<td>12.0</td>
<td>103</td>
</tr>
<tr>
<td>Arsenic – III</td>
<td>0.201</td>
<td>9.4</td>
<td>81</td>
</tr>
<tr>
<td>Dimethyl Arsenic Acid</td>
<td>0.226</td>
<td>6.7</td>
<td>104</td>
</tr>
<tr>
<td>Monomethyl Arsenic Acid</td>
<td>0.18</td>
<td>8.6</td>
<td>84</td>
</tr>
<tr>
<td>Arsenic - V</td>
<td>0.20</td>
<td>9.4</td>
<td>100</td>
</tr>
</tbody>
</table>
• Perchlorate

• Automation of sample preparation procedures
MIEEP:

• Sample analysis completed for all organic analytes in urine (up to 92 samples & blanks)

• Peer and QA review completed for: OP specific metabolites and environmental phenols

BEST:

• Sample analysis and data review completed for blood metals for 62 participants

FOX:

• PAH and phthalate analyses done for 40 samples
Publications

• Measurements of Polybrominated Diphenyl Ethers and Polychlorinated Biphenyls in a Single Drop of Blood,

• Fast and Simultaneous Determination of Urinary PAHs by liquid Chromatography/Tandem Mass Spectrometry,
  – Chemical Research in Toxicology, 25, 491 – 499, 2012

• Determination of Ten Monohydroxylated Polycyclic Aromatic Hydrocarbons by Liquid-liquid Extraction and Liquid Chromatography/Tandem Mass Spectrometry,
  – Talanta, in press, 2012
Future Work

• Finish MIEEP, FOX and BEST sample analysis

• Complete method validation
  – PBDE & PCB Dried blood spot and low volume blood
  – Metal panel in urine
  – Arsenic speciation
  – OP and pyrethroid metabolites

• Develop analytical method for perchlorate

• Expand analyte list
  – Organophosphate and pyrethroid pesticides

• Automate sample preparation