

Report to Scientific Guidance Panel:



Environmental Health Laboratory Update

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New Staff and Collaborators



- Biomonitoring California staff
 - Sungyeol Choi, LIMS specialist (CDC funded)
- Visiting Scholars
 - Prof. Ruifang Fan, South China Normal University (partially funded by CDC)
 - DaSheng Lu, Shanghai CDC (Fogarty fellow)

Laboratory Set up

- **2nd ICP-MS instrument - *Installed***
 - Urine metal panel
 - Metal speciation
- **Zephyr solid-phase extraction (SPE) workstation - *Purchased***
 - To automate sample preparation
 - Improve precision

Sample Analysis

Finished

- **Tulare II** Environmental Health Tracking (TCPy in 41 urine samples)
- **CHAMACOS** (Phthalates in 50 urine samples)
- **FOX** (Pb, Cd, Hg, Mn, 101 whole blood samples)
- **MIEEP** (Pb, Cd, Hg, 100 whole blood samples)

Coming

- **FOX** (101 urine samples)
- **MIEEP** (up to 100 urine samples)

New Methods

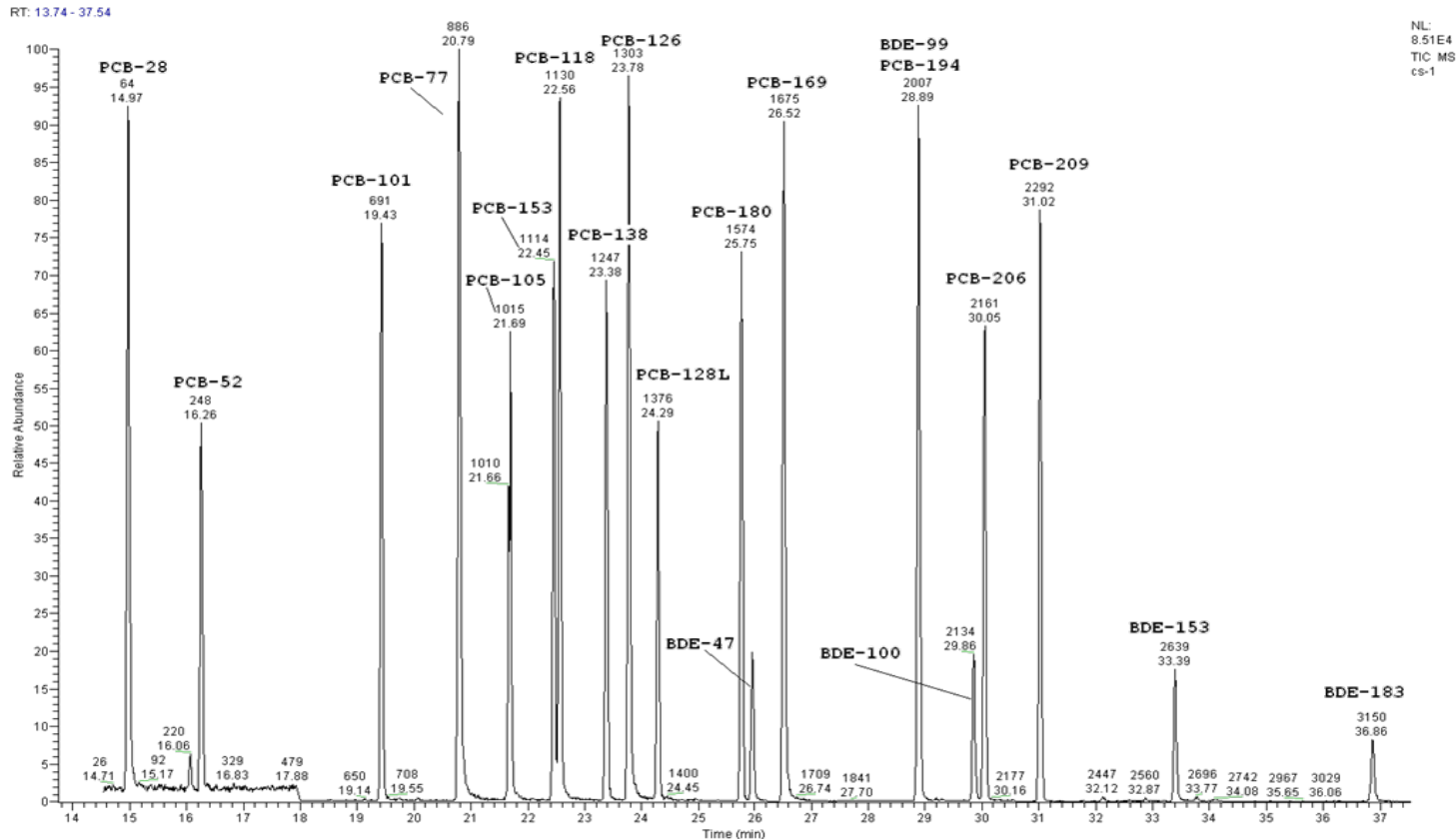
- **Under development**
 - Metal panel in urine by ICP-MS
 - As and Hg speciation in urine by LC-MS
- **Under validation**
 - Environmental phenols in urine by LC-MS/MS
 - OP pesticides: Dialkyl phosphate metabolites in urine by GC-MS/MS
 - Hydroxy-PAHs in urine by LC-MS/MS
 - PCBs and PBDEs in dried blood spots (DBS) by high resolution GC-MS

Challenges for DBS

- Extremely small volume of blood
- Potential contamination
- Extraction and recovery
- Stability of chemicals

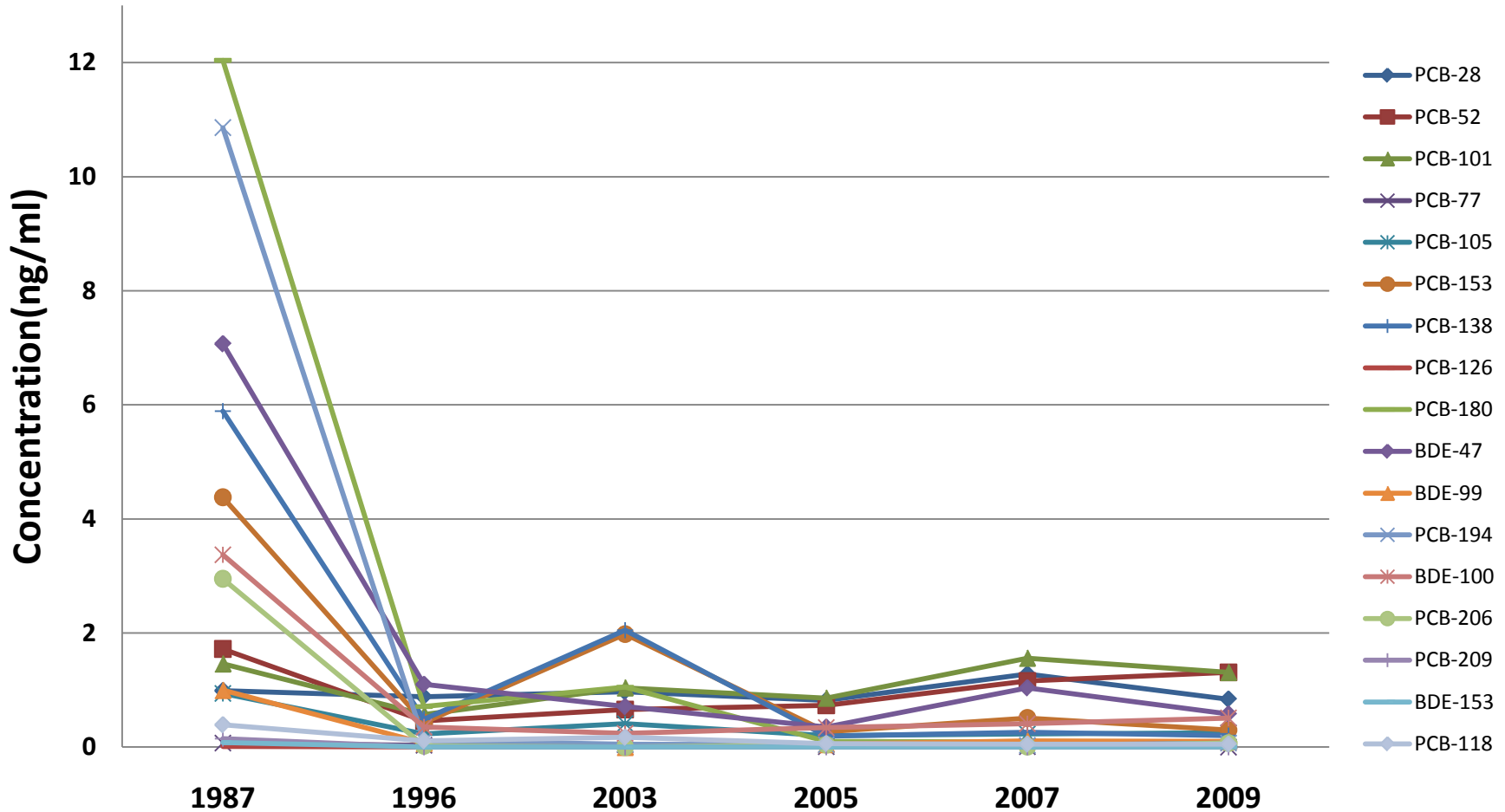
Analyses of POPs* in DBS

- 14 congeners of PCBs
- 5 congeners of PBDEs
- Linearity range :0.05-10ng/ml



*Persistent Organic Pollutants

Background of DBS Papers



PCBs and PBDEs in DBS

Type	Compounds	Reported value of U.S. CDC in serum (ng/g)	Spiked experiment (n=4)			Sample(n=12)	
			Spiked concentration (ng/g)	Recovery (%)	RSD (%)	Calculated value (ng/g)	RSD (%)
Marker-PCBs	PCB-28	0.03	0.033	47	4.8	2.12	12
	PCB-52	0.16	0.052	53	10.7	0.35	17
	PCB-101	0.01	0.045	93	14.1	0.14	18
	PCB-138	0.128	0.046	65	7.9	0.22	12
	PCB-153	0.121	0.041	93	10.2	0.26	13
	PCB-180	0.118	0.037	101	15.9	0.11	14
dl-PCBs	PCB-77	/	0.029	93	9.1	0.01	13
	PCB-105	0.007	0.045	76	16.1	0.11	14
	PCB-118	0.037	0.037	77	1.3	0.05	17
	PCB-126	0.000147	0.031	102	1.8	0	0
	PCB-169	0.000115	0.039	82	3.1	0	0
Other-PCBs	PCB-194	0.016	0.033	102	6.3	0.01	14
	PCB-206	0.013	0.041	90	9.4	0.01	15
	PCB-209	0.01	0.039	94	4.2	0	9
PBDEs	BDE-47	0.123	0.035	17	16.8	6.58	13
	BDE-100	0.024	0.047	90	18.7	0.28	23
	BDE-99	0.0413	0.063	0	11.2	0.53	19
	BDE-153	0.034	0.058	79	19.9	0.02	20
	BDE-183	0	0.044	120	9	0	0

Performance for Other Methods



- **Hydroxy-PAHs**
 - precision fair; 2-hydroxynaphthalene, 2-hydroxyfluorene, 2-hydroxyphenanthrene, 3-hydroxyphenanthrene, and 1-hydroxypyrene accurate; accuracy for others need to be tested
- **Environmental phenols**
 - precision good; BPA accurate; accuracy for others need to be tested
- **DAPs**
 - precision fair; DMTP and DMDTP accurate