

DTSC Laboratory Update



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Report to Scientific Guidance Panel
Oakland, CA
July 10, 2014

Status

- Staffing
- Progress with sample analysis
- Instrumentation for identifying “unknowns”
- Other DTSC activities that benefit the Program

Staffing

- CDC Cooperative Agreement:

- Erika Houtz, Ph.D.

- PFCs and precursors



- State Funding:

- 2 Limited-Term positions (2-yrs)

Status of sample analyses

- Completed analyses for:
 - PFCs for Expanded BEST (N=337)
 - PFCs, PCBs, OCPs, PBDEs, OH-BDEs for Three Generations (3G) study (N=750)
- Continuing analyses for:
 - PFCs, PBDEs, PCBs, OCPs for CA Teachers Study (CTS)
 - PBDEs, PCBs, OCPs for Expanded BEST

CA Teachers Study

(Funded by CA Breast Cancer Research Program, P Reynolds, Ph.D., PI)

- In collaboration with:
 - Cancer Prevention Institute of California, UCI, USC, City of Hope
- Sub-study on chemicals as risk factors for breast cancer
- Blood samples from ~1,200 cases and 1,200 controls from entire State
- Recruitment and sample collection: 2011-2014
- Analysis of PCBs, PBDEs, PFCs, thyroid hormones, lipids

Progress with the CA Teachers Study (CTS)

(as of July 1, 2014)

	n=2,439 received		
	PFC	PBDE	PCB/OCP
Aliquoted	2,025	2,025	2,025
Extraction completed	924	1,104	1,104
Instrument analysis completed	924	912	264
Data review completed	856	517	176
Data released to PI, posted on website	856	517	176



chds
Child Health and
Development Studies

Three Generations (3Gs) Study

Barbara Cohn, Ph.D., PI.

Funded by NIEHS, NCI, CBCRP

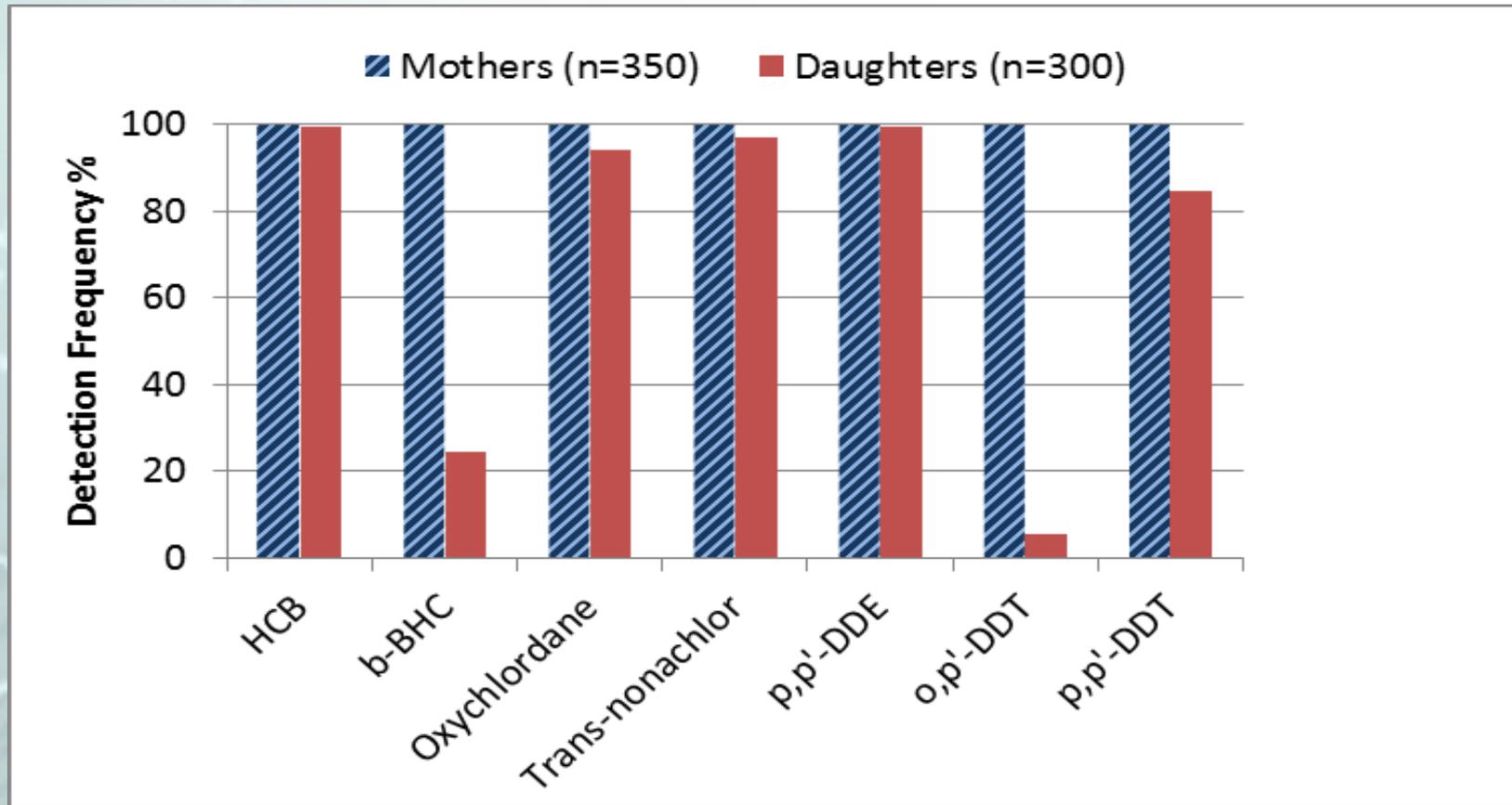
Over 20,000 pregnancies at Kaiser, Oakland from 1959-67
Mothers, Daughters, Grand-daughters

Sub-study:

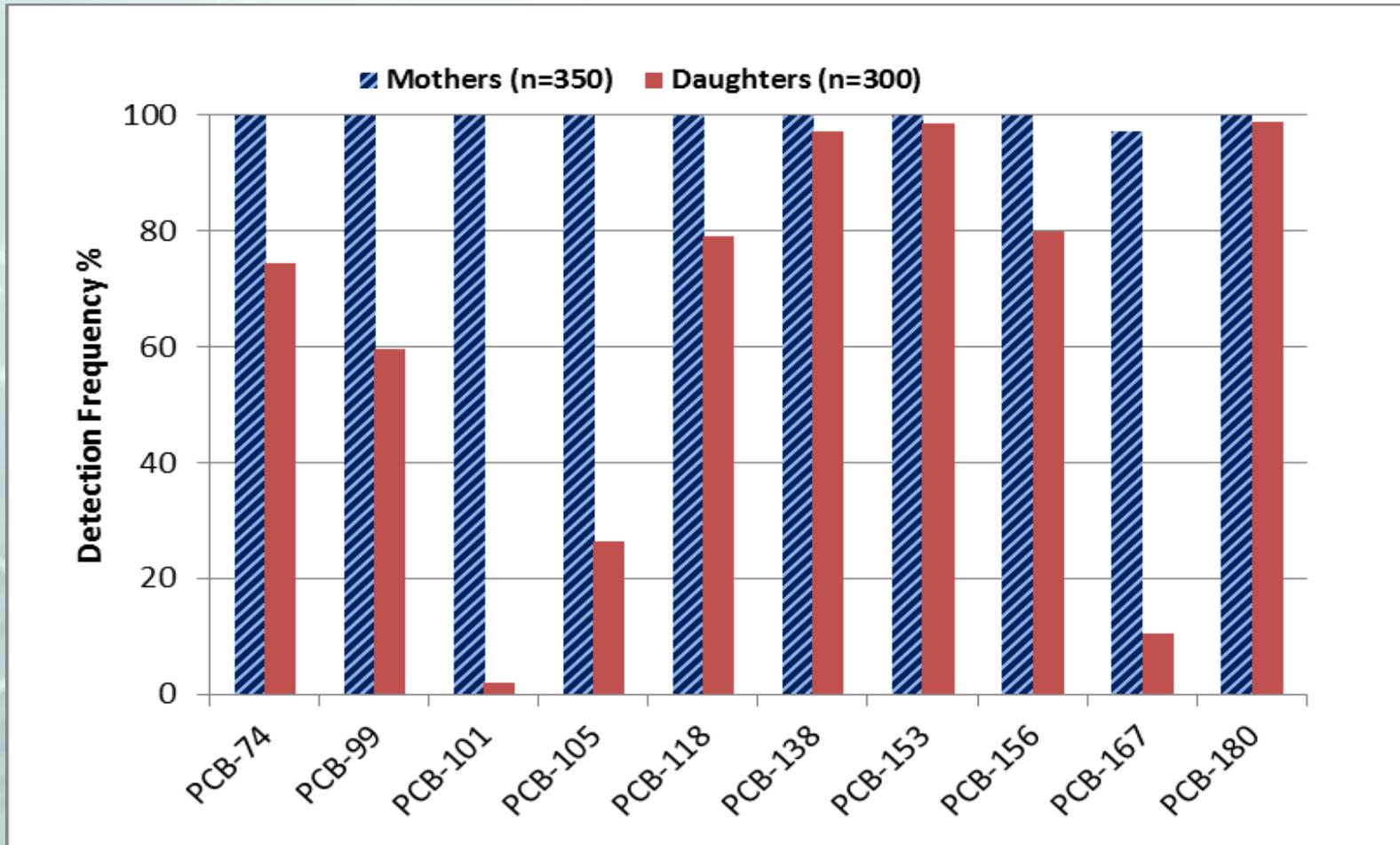
- Mothers (n=472 perinatal samples from 1959-66)
- Adult Daughters (n=300, sampled in 2011-12)

Following completion of the study, aggregate results will be posted on the Biomonitoring California website

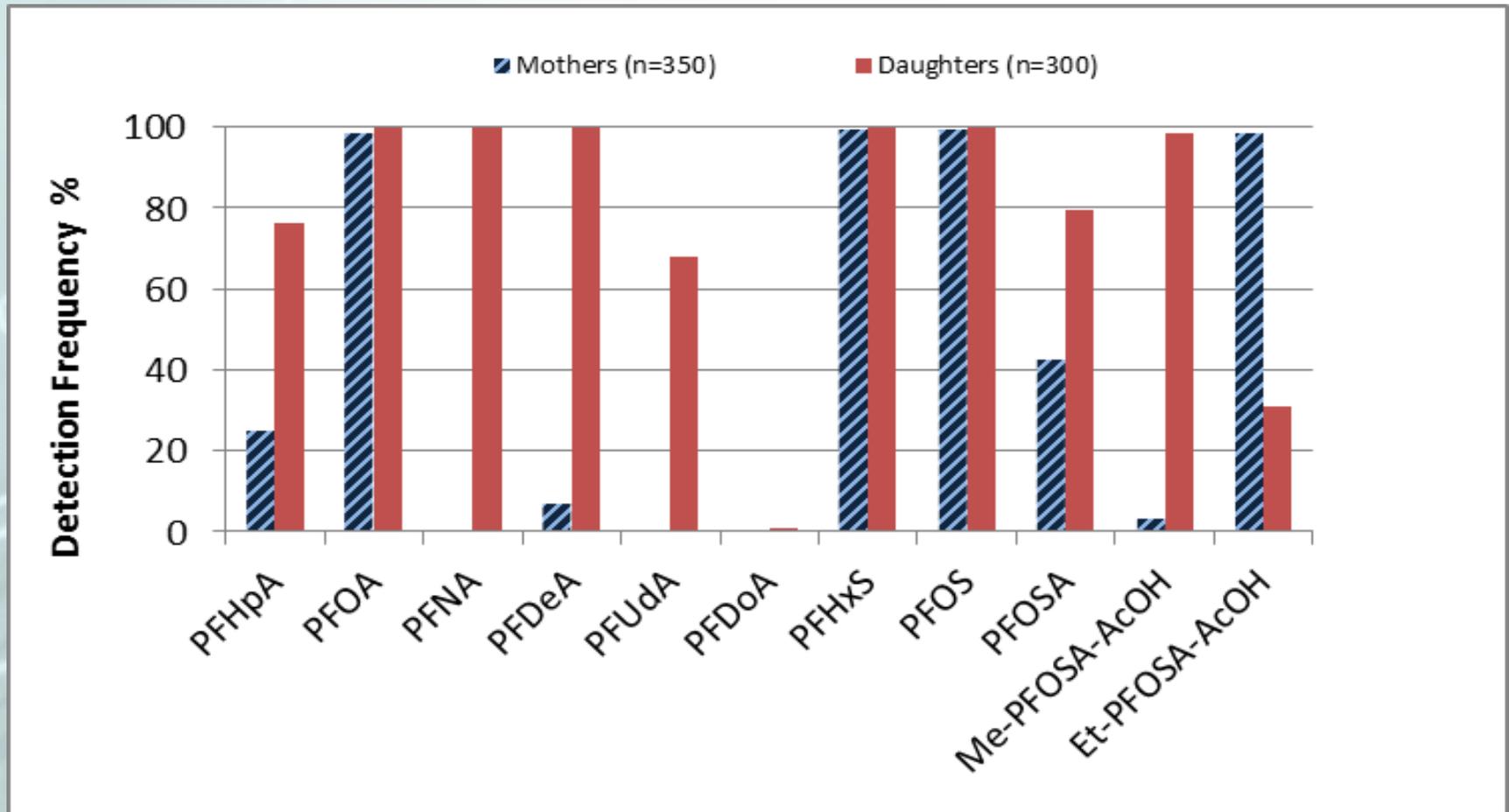
Detection Frequency of OCPs in Mothers' (1960s) and Daughters' (2012) Serum



Detection Frequency of PCBs in Mothers' (1960s) and Daughters' (2012) Serum



Detection Frequency of PFCs in Mothers' (1960s) and Daughters' (2012) Serum



Instrumentation for Identifying “Unknowns”

Chemicals identified via non-targeted screening may be important new candidates for biomonitoring

- **Agilent iFunnel QTOF 6550**
- **Installation/testing in June**
- **Training underway**

- **Cross-lab TOF group to co-ordinate work**



Emergo

KIMTECH
Kimwipes

GENUS 300
PEAK

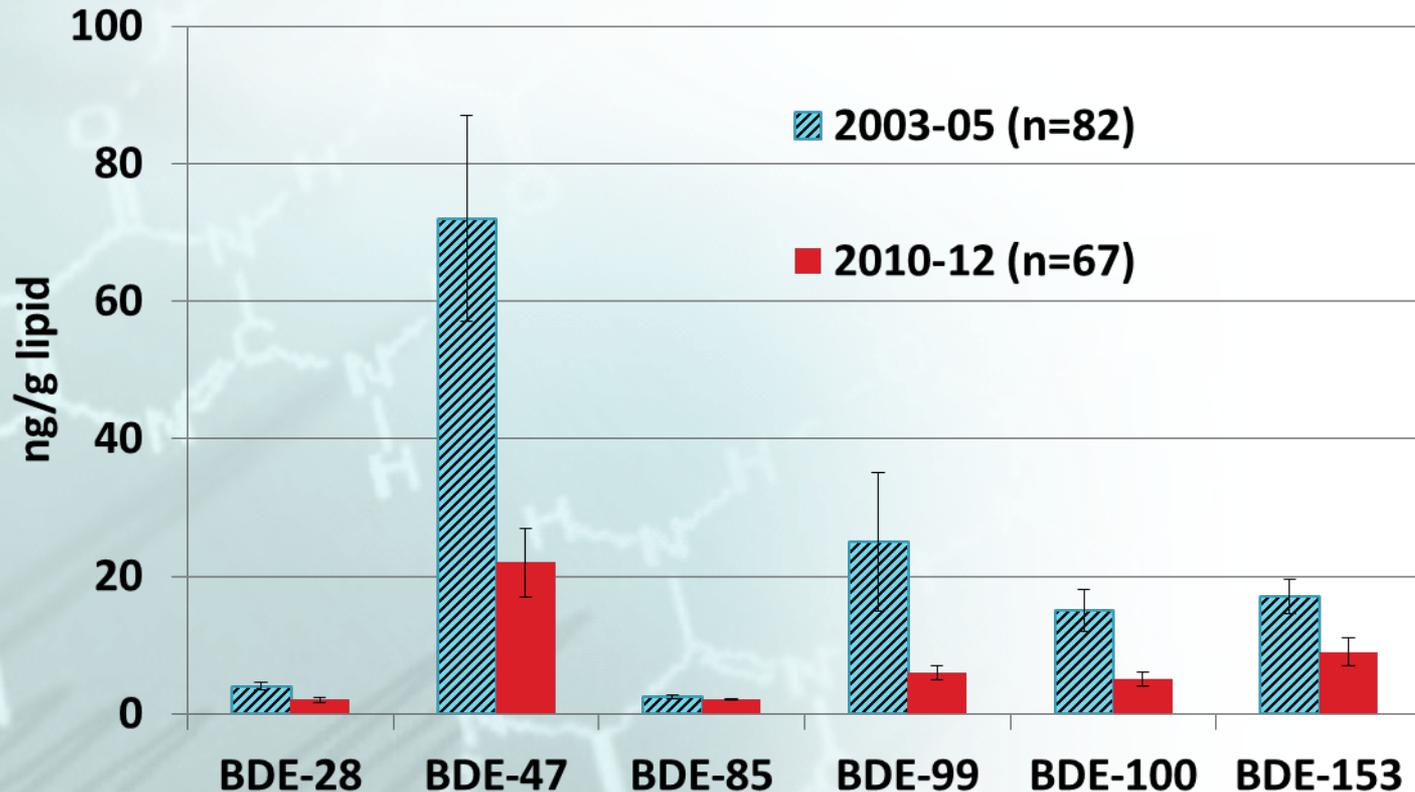
DTSC Activities

Santa Rosa Birth Center Study

- Partially funded by USEPA
- First time mothers (n=67; sampled in 2010-12)
- Serum, cord blood and breast milk analyzed for PBDEs, OCPs, PCBs, PFCs, OH-BDEs
- House dust, dryer lint to be analyzed
- Exposure assessment questionnaire

Aggregate results will be shared with Biomonitoring CA

Declining PBDEs in Breast Milk from Santa Rosa Birth Center Mothers



(Park et al. ES&T, 2011; Guo et al. BFR2014)

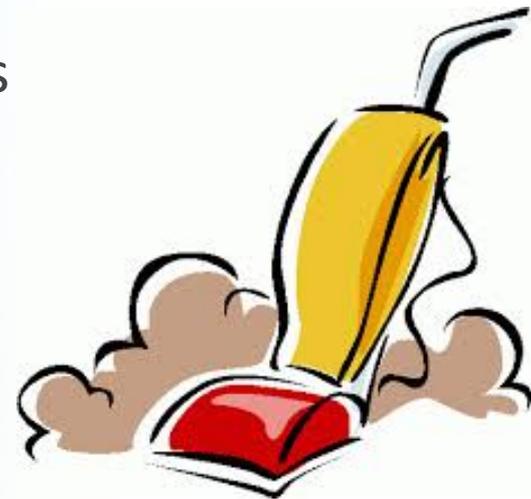
Pregnant Women from SF General Hospital

- PBDEs and OH-BDEs in serum of pregnant women
- Recruitment underway (2014: n=50; 2015: n=120)
- Sample collection underway
- Comparable demographics with previous studies (2008-09 and 2011-12)
 - Determine trends
- Funded by NIEHS, Tracey Woodruff, Ph.D., PI

Aggregate results will be shared with Biomonitoring CA

Dust Studies

- Environmental samples complement biospecimens
- Integrated measure of exposures over space and time
- Pathways from consumer products
- UCB/DTSC study of >200 Northern CA homes
- FOX study of 20 Orange County Fire Stations



Analysis of Residential and Fire Station Dust

Completed:

- Brominated Flame Retardants, including PBDEs, Firemaster
- PAHs

In process:

- Phosphorus Flame Retardants, including TDCPP, TCEP
- Brominated and Chlorinated Dioxins/Furans
- Perfluorinated Chemicals and Precursors
- Phenolics (BPA, Triclosan, etc.)
- “Unknowns”
- New dust samples from Fire Stations across the US

California Childhood Leukemia Study (CCLS) (In collaboration with UC Berkeley)

Case-control study on environmental and genetic risk factors for childhood leukemia

- Completed analyses for PBDEs, PCBs, OCPs in:
 - Vacuum Cleaner Dust from 204 homes (sampled 2x)
 - Children's Whole Blood
 - Mothers' Serum (in response to Request for Information, 2012)



CCLS Results

Maternal serum levels of multiple major PBDEs were positively associated with household dust-PBDE levels (after adjusting for blood lipid levels, country of origin, and household annual income)



Publications

**Comparison of blood drawing tubes for the analysis of POPs/PFCs/lipids
(Guo et al. Chemosphere, 10.1016/j.chemosphere.2014.04.007)**

**Extraction of OH-BDEs from human serum and quantitative analysis by
LC-MS/MS**

(Petropoulou et al., J Chromatography, 10.1016/j.chroma.2014.06.048)

Manuscripts in review:

**Brominated Flame Retardants in Residential and Fire Station Dust
Samples from California (Brown et al., Environ Research)**

FOX: Firefighters' exposures to POPs (Park et al., ES&T)

QUESTIONS?