

DTSC Laboratory Update



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Status

- **Staffing**
- **Capabilities for analysis of chemicals on the Priority List**
- **Progress with FOX and MIEEP studies**
- **Challenges and Opportunities**

Challenges: Staff shortages

(from July 2011 SGP presentation)

- **40% vacancy rate at DTSC Biomonitoring Section
(4 out of 10 PYs)**
- **Of the 6 filled positions, both of our 2 CECBP-funded staff are on leave**

Staffing

DTSC Positions:

Dr. June Soo Park, Biomonitoring Section Chief

Section has 10 positions; 4 vacancies

Of the 2 CECBP-funded staff, 1.3 PY on leave

Permission to fill 2 of 4 vacancies



CDC Cooperative Agreement:

Dr. Sabrina Crispo-Smith

Environmental Lab Scientist II

Joined in October



We Have Validated Methods and Capabilities for:

- **Polychlorinated Biphenyls (PCBs)**
- **Organochlorine Pesticides (OCPs)**
- **Polybrominated Diphenyl Ethers (PBDEs)**
- **Perfluorinated compounds (PFCs)**

Brominated Flame Retardants (BFRs) in Serum

- Various BFRs belong to different chemical classes requiring different methodologies
- Most BFRs we have tested are not present in human serum
 - Not absorbed?
 - Metabolized?
 - No reports of measurements in human serum
- Decided to limit measurements to only those BFRs that are extractable by current method

BFRs in Serum

Chemicals	ECL Status
GC-High Resolution MS	
Bis(2-ethyl-1-hexyl) tetrabromophthalate (TBPH)	Capable, but almost non-present in human serum
1,2-Bis(2,4,6-tribromophenoxy)ethane (BTBPE)	
1,2-Dibromo-4-(1,2-dibromoethyl)cyclohexane (TBECH)	
2-Ethyl-1-hexyl-2,3,4,5-tetrabromobenzoate (TBB)	
Pentabromoethylbenzene (PBEB)	
2,3-Dibromopropyl-2,4,6-tribromophenyl ether (DPTE)	
Pentabromotoluene (PBT)	
Allyl 2,4,6-tribromophenyl ether (ATE)	
2-Bromoallyl 2,4,6-tribromophenyl ether (BATE)	
Hexabromobenzene (HBB)	Capable, trace levels in human serum
LC-MS/MS	
Hexabromocyclododecane (HBCD)	Next goal

Phenols in Serum by LC-MS/MS

Chemicals	ECL Status
Bisphenol A (BPA)	Validated on bovine serum; Testing on archived human serum
Tetrabromobisphenol A (TBBPA)	
2, 4, 6-Tribromophenol	
2, 4-Dibromophenol	

Progress on MIEEP and FOX:

Analyses are on schedule

	MIEEP (n=141)				FOX (n=106)*			
	PFC	PCB/ OCP	PBDE	BFR	PFC	PCB/ OCP	PBDE	BFR
Extraction completed	141	141	141	141	106	0	0	0
Instrument Analysis Completed	141	103	141	30	106	0	0	0
Data Review Completed	75	30	30	30	106	0	0	0

*FOX (n=106 samples from 101 participants)

Challenges

- **Method development vs. sample analysis**
 - **Few BFRs are measurable with current method**
 - Focus only on those that can be measured
 - **Improved methodology for PFCs (branched isomers)**
 - Adapt and re-validate
 - **Hydroxy metabolites by GC-MS (derivatization) vs. LC-MS/MS**
- **Staffing**
 - **Vacancies, leave**

Opportunities

- **Collaboration with Orebro University, Sweden, on PFCs**
 - **Dr. Anna Kärrman**
- **Collaboration with UCSF on Hydroxy BDEs**
 - **Dr. Linda Linderholm (Stockholm University)**
- **Collaboration with UCSF on BPA in serum analysis**
- **Program-wide coordination on QA/QC and Laboratory Information Management System**

QUESTIONS?