

Report to Scientific Guidance Panel:

CDPH

Environmental Health Laboratory  
Update

Jianwen She, PhD

Environmental Health Laboratory  
CDPH

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# Presentation overview

- Recent trainings
- Quality control (QC) & Proficiency testing
- Method development
- Collaboration

# Staff training at CDC



# What we learned

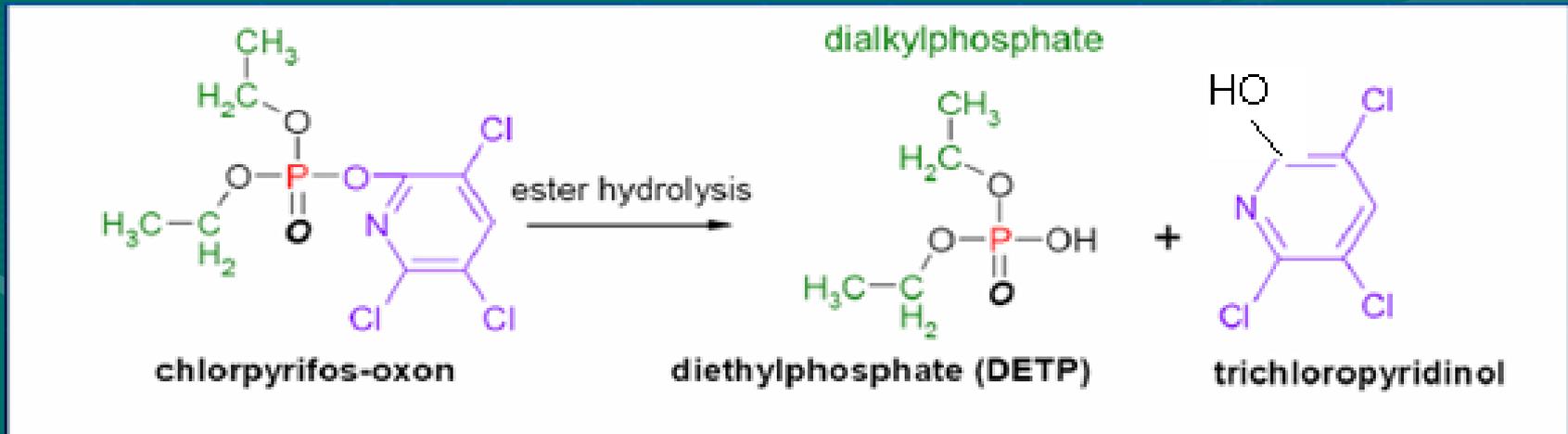
- Lab setup, work flow
- Sample preparation
- CDC instrumental methods
- Quality Assurance and QC
- CDC Labs' views to select biomarkers
- ...That we cannot replicate the CDC methods exactly

# QC and Proficiency Testing

- Internal QC Performance Monitoring
  - Three levels of QC
  - QC Pool Preparation and characterization
- External QC Performance Assessment
- Proficiency Tests (PT) with CDC and other PT providers

# Organophosphate (OP)-specific Metabolites

Parent Compound → DAP + Specific  
Metabolite



# OP-specific Metabolite: 3,5,6-Trichloropyridinol (TCP)

- Optimized the sample preparation
- Adapted instrumental (LC-MS) analysis method
- Completed method validation (20 batches)
  - Good linearity ( 9 point calibration curve)
  - Good precision (CV < 15%) and accuracy
- Completed QC pool characterization
- Method will be ready ~ September 2009

# Pyrethroid Metabolite : 3-Phenoxybenzoic Acid (3-PBA)

- Optimized the sample preparation and instrumental (LC-MS) analysis methods
- Method validation – in progress (15 batches)
  - Good linearity ( 9 point calibration curve)
  - Poor CV (some values are above 15%)
- We are working to resolve CV problem
- Method will be ready ~ December 2009

# Phthalate Metabolites

<u>Parent Phthalate</u>	<u>Metabolite</u>
Di-ethyl phthalate	Mono-ethyl phthalate (MEP)
Di-octyl phthalate	Mono-(3-carboxypropyl) phthalate (MCPP)
Di-butyl phthalate	Mono-butyl phthalate (MBP)
Benzylbutyl phthalate	Mono-benzyl phthalate (MBzP)
Di-2-ethylhexyl phthalate	Mono-2-ethylhexyl phthalate (MEHP)

# Phthalate Metabolites

- Completed Instrumental (LC-MS) analysis method
- Sample preparation protocol – in progress
- Methods for MEP and MCPPE will be ready ~ December 2009; we expect MBP and MBzP methods to follow quickly

# Hydroxy-PAH: 3-Hydroxyphenanthrene (3-PHEN)

- Completed instrumental (GC-MS) analysis method
  - Good linearity
  - High sensitivity
- Currently full set of standards is unavailable; custom organic synthesis will be required
- Sample preparation – in progress
- Method will be ready ~ December 2009

# Blood Metals Update

- Lab consistently passed national proficiency tests for lead (Pb), cadimium (Cd) and mercury (Hg)
- Generating new whole-blood reference material for Pb, Cd, Hg and Manganese
- Developing and validating in-house urine creatinine analysis
- Next project will be urine metals panel

# Collaborations with Environmental Tracking and RFI Partners

- 34 urine samples for TCP
  - Chlorpyrifos drift study in Tulare County (BIODRIFT II)
- 100 urine samples for TCP and 3-PBA
  - UC Davis Childhood Autism Risks from Genetics and the Environment (CHARGE)
- 30 urine samples for phthalates
  - UC Davis Markers of Autism Risk in Babies – Learning Early Signs (MARBLES)
- 50 urine samples for phthalates
  - UC Berkeley Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS)

# CDPH lab scientists at work



# Metabolism of permethrin

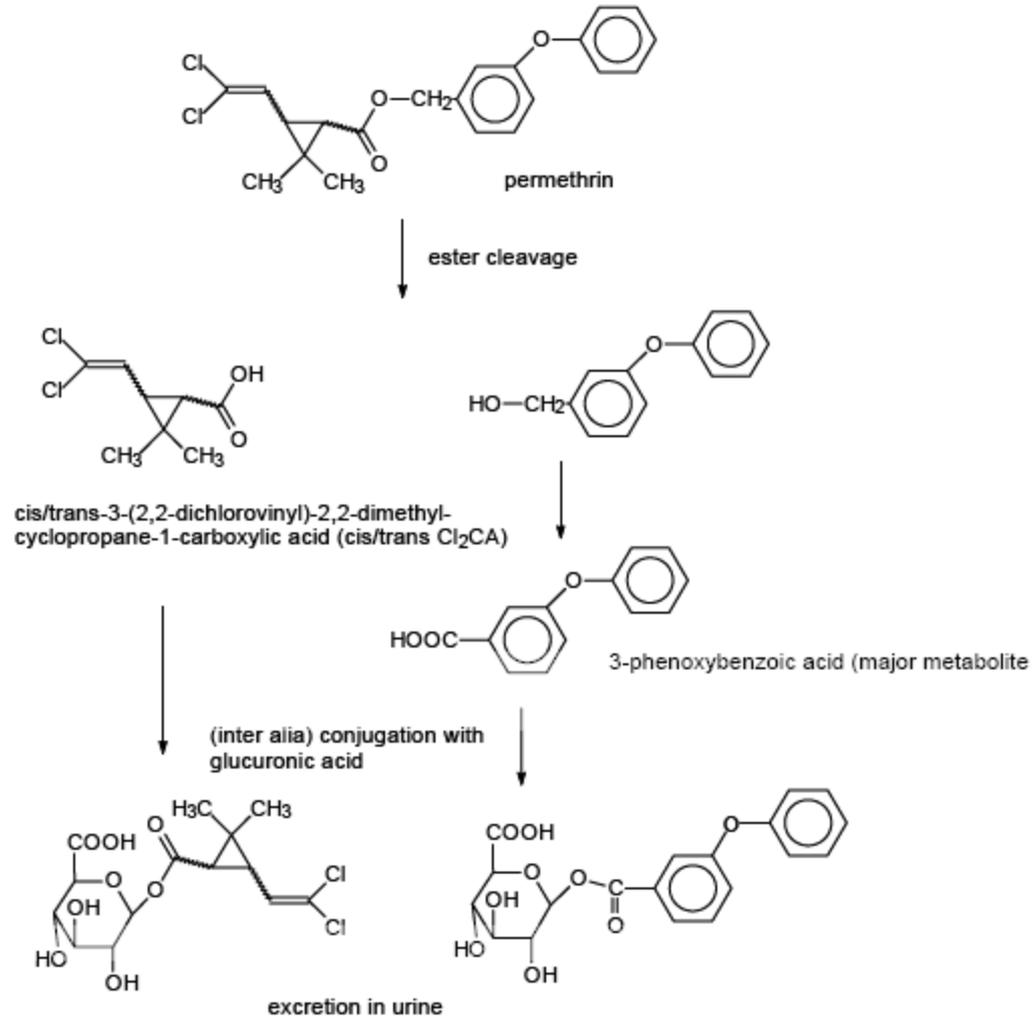


Figure 1. Metabolism of permethrin in mammals