Why Chemical Selection is Important for the Lab

Peter Flessel, PhD, Chief
Environmental Health Lab
California Department of Public Health

Building Lab Capability

- Measuring environmental chemicals in human samples is a very tricky business – harder than finding needle in a haystack.
- Only a few labs in the world can do it well.
- The essential ingredients are:
  - Highly skilled, hard to find chemical scientists.
  - Very expensive equipment – basics >$2M!!
  - Rigorous organization and standardization of lab activities = “Quality Assurance & Control”

Why Not Contract Lab Tests Out?

- How about CDC's lab? – We asked, but CDC doesn't have the capacity.
- Commercial labs? – A few can biomonitor, but methods are good for highly exposed populations (e.g. workers) , not for "normal" exposure levels. No market.
- Policy decision to build state lab capacity for public and environmental health.

We're Starting Small and Building

- State Labs have some capability now.
  - DTSC Lab can measure Persistent Organics.
  - CDPH Lab can measure Metals.
- In current year we are purchasing equipment and hiring lab supervisors.
- Future resources needed to hire lab staff to "turn the crank" and produce results.


EXIT

Selecting Chemicals is Key

- We are not a Crime Lab – we don't search for all chemicals in blood and urine the way a forensic lab does.
- We only apply methods for the specific chemicals that are selected – if a chemical is not selected, we don't test for it.
- Even after selection, it will take labs 1- 2 years to be able to test human samples.

Why so long to establish a method for Chemical “X”?

1. Review scientific literature and choose best biological sample (blood, urine, etc.)
2. Develop best process (i.e., “recipe”) to extract the chemical from the sample.
3. Decide on best lab instrument for testing.
4. Train staff to extract chemical and to use lab instrument chosen for the analysis.
5. Establish standard operating procedure (SOP).
6. Test to ensure method is measuring what is intended – Practice and validate.

Why is Chemical Selection so Important to the Lab?

- Lab needs to know the chemicals (i.e., target analytes) in order to begin long process of developing tests to measure them.
- So let's get going!