

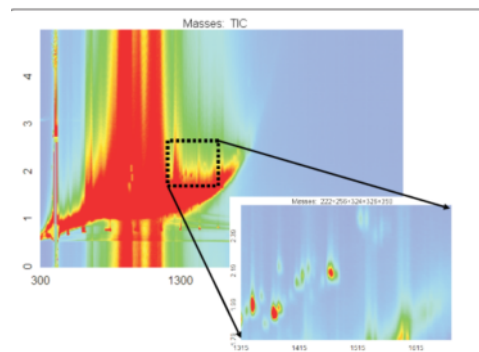
Screening of San Francisco Bay mussels and harbor seal tissues for anthropogenic pollutants

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Background

- Vast majority of biological monitoring efforts only measure pollutants from a set list
- Recent studies provide evidence for pollutants that likely bioaccumulate but are not monitored
- Rarely do studies incorporate screening into their design

Objective

- Use capabilities of two-dimensional gas chromatography mass time-of-flight spectrometry (GC X GC TOF) to screen marine samples for new pollutants
 - Advantages: huge capacity allowing resolution of complex mixtures
 - Comprehensive libraries available to assist with identification of unknowns
- Major questions
 - A: Which chemicals have the potential to impact humans and aquatic life and should be monitored?
 - B: What potential for impacts on humans and aquatic life exists due to contaminants in the Estuary ecosystem?

Approach

- Year 1
 - Harbor seal sample collection by the Marine Mammal Center (Sausalito, CA)
 - Plan and conduct mussel deployment in SF Bay
 - Method refinement using California Sea lion blubber and serum control materials
 - Apply method to harbor seal samples (blubber and liver)

Proposed approach: blubber

extraction

- Homogenate V: Sea lion blubber from 2001 round robin
- Pressurized fluid extraction

cleanup

- Minimal cleanup
- Size exclusion chromatography (SEC)

analysis

- GC x GC TOF compare spectra to NIST library
- Analyze SEC extract pre and post MTBSTFA derivatization

Proposed approach: Serum or liver

extraction

- MMCM1: sea lion serum used in 2007 round robin
- Microwave extraction method for lipophilics

cleanup

- Normal cleanup for lipophilics (acidified silica, alumina)
- Raw serum, crash protein, remove supernatant, take to dryness and derivatize

analysis

- GC x GC TOF of lipophilic extract pre and post derivatization
- GC x GC TOF of derivatized, protein free serum
- Compare spectra to NIST library

Progress to date

- Coordinated harbor seal collection
- Coordinated GC x GC TOF work
 - Working with Elizabeth McGaw in Gaithersburg who used technique for human serum screening
 - Planned first lab experiment– start with blubber extracts on 3/29
- Partnership with SCCWRP/SDSU
 - Parallel efforts
 - Leverage expertise
 - Met with Keith Maruya on 3/18

Future plans

- Spring/summer: continue method development using serum
- Fall/winter:
 - apply method to harbor seal samples
 - add new compounds to library
 - Begin method development using mussel tissue
- **2011**
 - Mussel analysis
 - Continue to expand library with new compounds
 - Explore use of LC-QTOF
 - First manuscript