



UC BERKELEY
SUPERFUND
RESEARCH PROGRAM
SCIENCE FOR A SAFER WORLD



Welcome

The Problem of PFAS Contamination: How Can We Make Rapid Progress to Address it?

NIEHS Superfund Research Center
Translation Core in collaboration with OEHHA

Organizing Committee:

Andres Cardenas, Sarah Elmore, Amy Kyle, Melanie Marty,
Cliona McHale, Rachel Morello-Frosch, Junesoo Park,
David Sedlak, & Lauren Zeise

Assisted by Gayle Cepparo

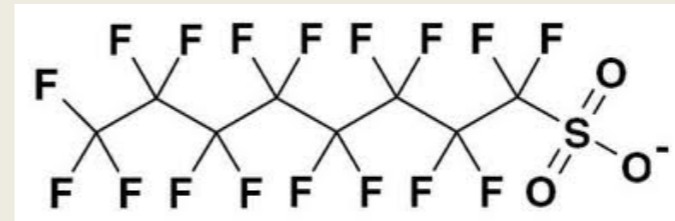
History of the Superfund Research Program

- In 1986, the NIEHS Hazardous Substances Basic Research and Training Program [the Superfund Basic Research Program (SBRP)] was created under the Superfund Amendments and Reauthorization Act (SARA).
- Congress, under SARA, authorized NIEHS to develop a university-based program of basic research and training grants to address the wide array of scientific uncertainties facing the national Superfund Program.
- UC Berkeley/UCSF joint Center was one of the first of 4 Centers to be funded under the SBRP in 1987.
- Ours is the only Center to be continuously funded since 1987.
- More info at <https://superfund.berkeley.edu/>

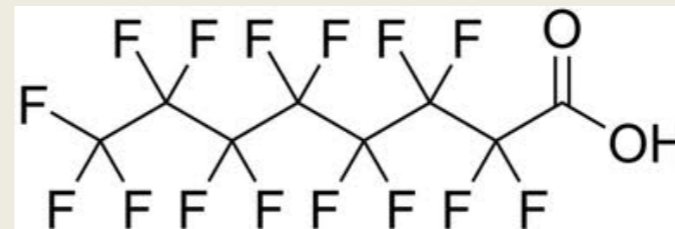


Per- And Polyfluoroalkyl Substances (PFAS)

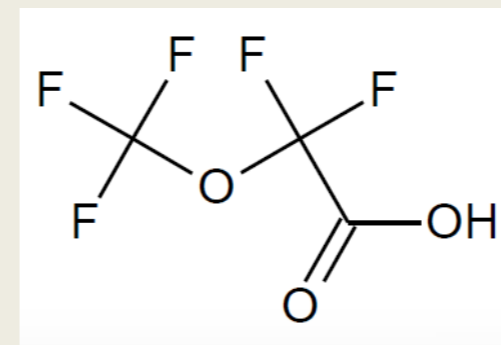
- Group of more than 6,000 chemicals
- Mobile, persistent, and accumulate in food chains
- Resistant to grease, water, and oil
- Many PFAS and alternatives that are not well studied



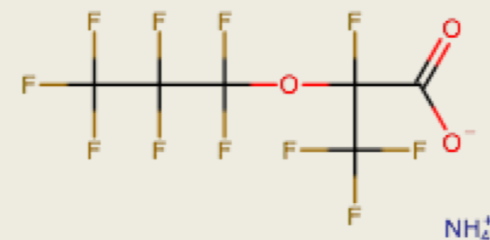
PFOS



PFOA



PFMOAA



GenX

Background and Objectives for the Meeting

- There are over 6,000 perfluoroalkyl and polyfluoroalkyl substances (PFAS) in use and many more possible breakdown products and metabolites.
- The carbon-fluorine bond is extremely strong and hence many PFAS are extremely persistent, while often being highly mobile in environmental media allowing them to contaminate water systems and supplies.
- Regulators wish to classify these chemicals into groups with regard to their toxicity (T), and characterize their persistence (P), mobility (M) and potential for bioaccumulation (B), based on the Hazard Traits in CA.
- This meeting will discuss whether such grouping is possible and if so what approaches could be taken to generate the data required to make decisions.
- We will discuss what should be done in the short-term (1-2 years) and long-term (5-10 years) for each of the subject areas.

California's Hazard Traits

**Toxicological
19 Traits**

**Environmental
9 Traits**

**Exposure Potential
8 Traits**

**Physical
3 Traits**

Hazard Traits

- Term in California legislation
- Coverage: “All of the health end points that are relevant to the people of the state in the design and implementation of programs for toxic chemicals.”
- Properties of chemicals

Morning Agenda

9.00 Opening Remarks: Where We Are and What We Want to Achieve Today

Welcome and purpose of this meeting: Martyn Smith, Andres Cardenas (UCB)

California perspective: Joaquin Esquivel (CA SWRCB)

The Chemistry of PFAS – A Primer: Kathleen Durkin (UCB)

9:30 Introduction to Grouping and Read-Across – Gina Solomon (UCSF/PHI) - Grouping and Read-Across, with David Reif (NCSU)

10.00 Characterizing Toxicity – Human Studies. Chair: Andres Cardenas (UCB)

What do we know so far about health effects in humans? – Andres Cardenas

CDC studies – Scott Bartell (UCI)

Recent findings – Barbara Cohn (UCB)

10.40 Break

11.00 Characterizing Toxicity – Animal Studies and HT Screening. Chair: Melanie Marty (OEHHA)

Summary of classical toxicology studies to date – Christopher Banks (OEHHA)

Recent animal studies – Chris Lau (U.S. EPA)

In Vitro Studies – Michael De Vito (U.S. EPA) *by Videoconference*

11.30 Collective discussion on characterizing and grouping PFAS on basis of toxicology and human studies. Chairs: Andres Cardenas and Melanie Marty (OEHHA). Morning participants.

Early Afternoon Agenda

1.00 Characterizing Toxicity – Using Computational Toxicology. Chair: Carla Ng (U.Pittsburgh)

David Reif (NCSU) *by Videoconference*

Carla Ng (U. Pittsburgh)

E. Azhagiya Singam (UCB)

1.30 Collective discussion on characterizing and grouping PFAS on basis of computational toxicology. Chairs: Kathleen Durkin (UCB) and Lauren Zeise (OEHHA).

2.00 Characterizing Exposure and the Potential for Bioaccumulation? Chair: Rachel Morello-Frosch (UCB)

Chair's Summary – Rachel Morello-Frosch

Biomonitoring data and results from drinking water monitoring – June-Soo Park (DTSC)

Accumulation in Ecosystems – Rebecca Sutton (SFEI)

Bioaccumulation of PFAS – Rainer Lohmann (URI)

Collective discussion on bioaccumulation.

2.50 Break

Late Afternoon Agenda

3.10 Characterizing the persistence and mobility of PFAS in the environment?

Chair: Rula Deeb (GeoSyntec)

Chair's summary – Rula Deeb.

Assessing persistence and environmental mobility – Andre Algazi (DTSC)

Quantifying persistence – Tom Webster (Boston U.)

Removing persistent PFAS – David Sedlak (UCB)

Collective discussion on persistence and mobility

4.00 Collective discussion of how we group PFAS on the basis of persistence, mobility and potential for bioaccumulation. Can we rank/group them on basis of persistence, mobility and potential for bioaccumulation to control them better.

Chairs: Tom Bruton (Green Science Policy Institute) and Rainer Lohmann (URI).
Afternoon participants.

4.30 What have we learned about grouping PFAS and what should be the next steps? Can we incorporate multiple traits, including but not limited to potential health impacts, in characterizing these chemicals?

Discussion led by Vincent Cogliano (CalEPA) and Amy Kyle (UCB)

5.00 Closing remarks followed by Wine and Cheese reception

Formula and Audience Involvement

- Everyone gets only 10 minutes (tough, I know)
- Open discussion and creative ideas desired
- Audience members strongly encouraged to submit questions and comments on 3x5 cards especially if they don't get time to raise them during discussion (Optional: Put name and email on back of card)
- Cards available at registration table

Goals

We encourage comments on two key points:

- **What actions could be taken within a timeframe of 1 to 2 years to improve our ability to appropriately assess and act on PFAS chemicals?**
- **What are promising ways to “group” chemicals or otherwise take actions to make assessment more tractable now?**