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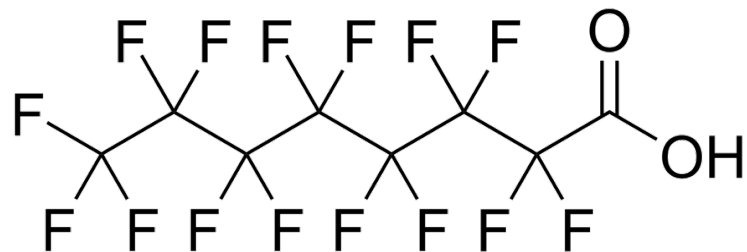
Sources, Transport, Exposure & Effects of PFASs
UNIVERSITY OF RHODE ISLAND SUPERFUND RESEARCH PROGRAM

What makes PFASs Unique

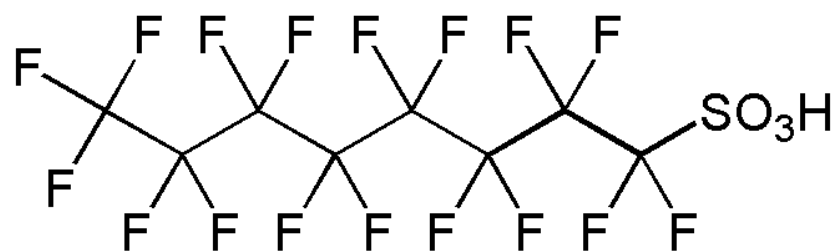
Angela Slitt
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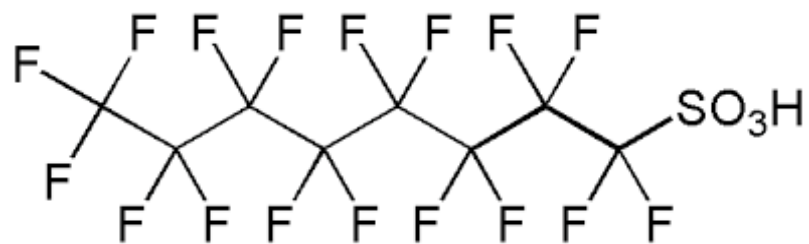
PFAS Structure: Molecular



PFOA



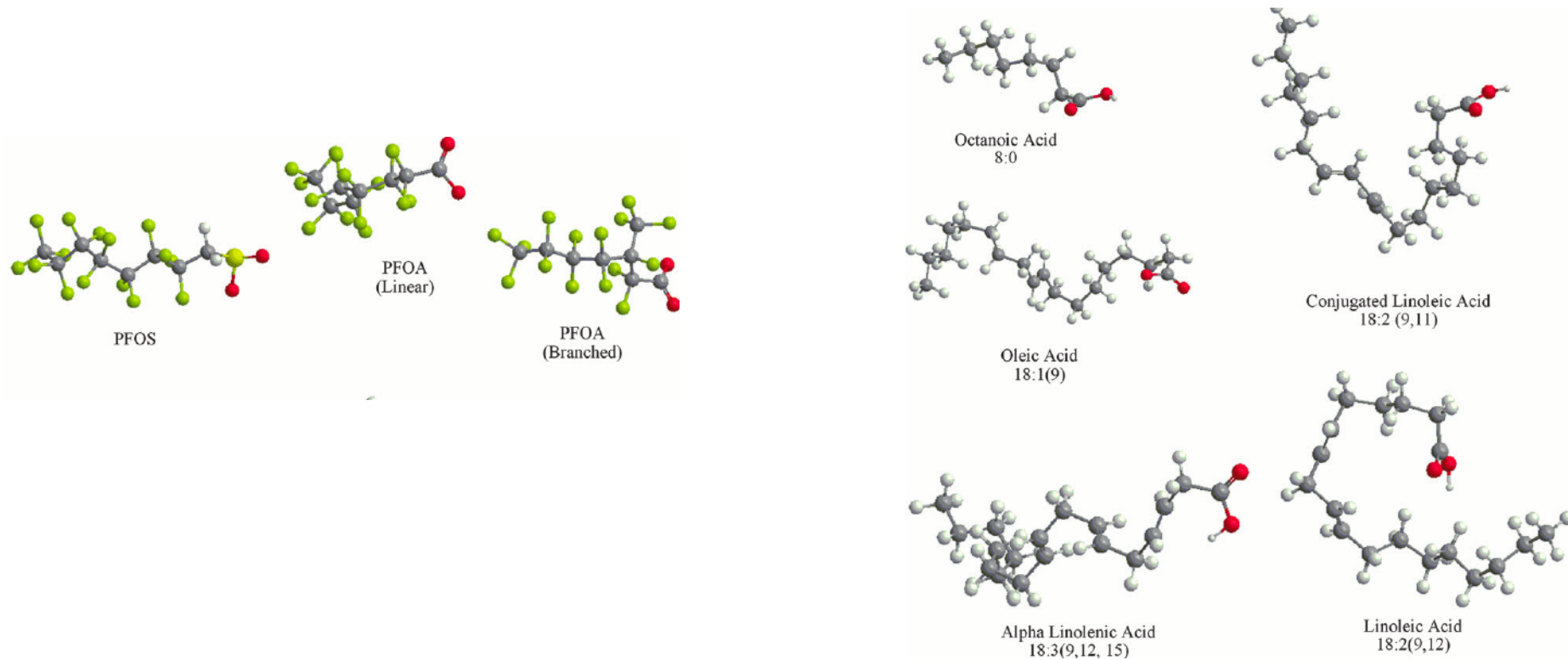
PFOS



PFHxS

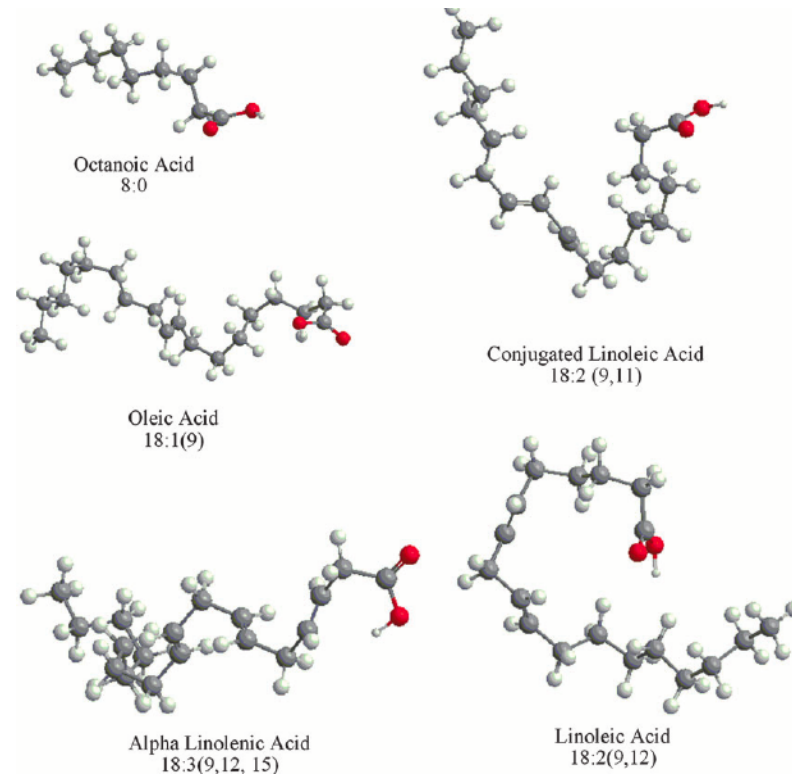
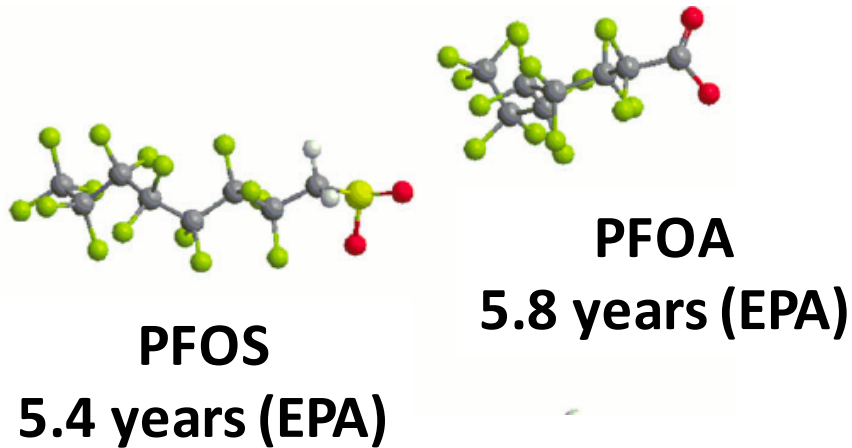
- ❖ The “F”s are Fluorine.
- ❖ Notice that there are a lot!
- ❖ Fluorine found in living systems is rare

PFASs look like fats from our body



Vanden Heuvel et al.. (2006). *Toxicological Sciences* 92. 476-89

Time in the human body – long



Recent work (Sweden, after end of exposure to drinking water):

3.4 years – PFOS

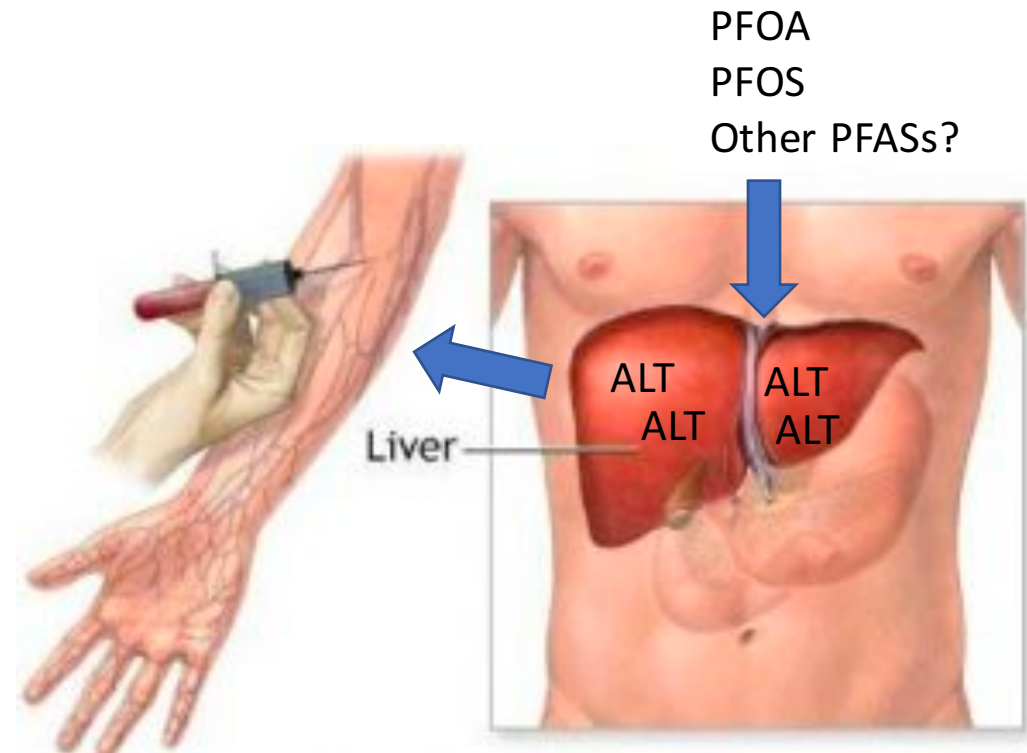
2.7 years – PFOA

5.3 years – PFHxS

Li Y, et al. *Occup Environ Med* 2017;0:1–6.

What they do in the human body

- Many PFASs studies point to effects to liver for both rodents and humans
- Liver is not the only system, but is one of the systems in the body that shows a signal to PFAS exposure



PFAS Physiochemical Properties and Liver Effects

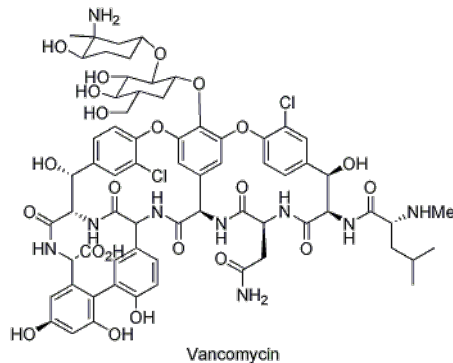
Physiowhat??

- ❖ *Physiochemical properties* are properties of a chemical substance
- ❖ Physiochemical properties can dictate some of the properties that a chemical can possess in a living system
- ❖ Our project will seek to understand some PFAS physiochemical properties with other behaviors PFASs has in liver cells grown in the laboratory

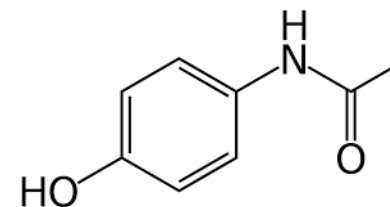
What are some “Physiochemical” properties

Molecular Weight – what is this?

This is how “big” or “small” a chemical is based on the elements that make it up.



Large Molecular Weight
(Vancomycin)



Small Molecular Weight
(Tylenol)

What are some “Physiochemical” properties

- ❖ *Lipophilicity and permeability*
- ❖ Lipophilicity has the word root word “lipo” Think liposuction. Lipo means *lipid*, which is a fancy way to refer to fat.
- ❖ *Does the chemical prefer to be in fat or water?*
- ❖ This property helps us understand whether the chemical can easily penetrate cells of a living organism. If it can, it is permeable.



Remember This?

Does our chemical go here?



Does our chemical go here?

How does this relate to us and to you?

- Us: We will try to better understand properties of PFASs that make them permeable and relate that to their effects to cells grown in the lab, such as cells from human livers and fat tissue.
- You: We hope having more accurate values for PFASs we know less about will help scientists better model (using complex computer programs) exposure to humans and wildlife.

What are we doing at URI?

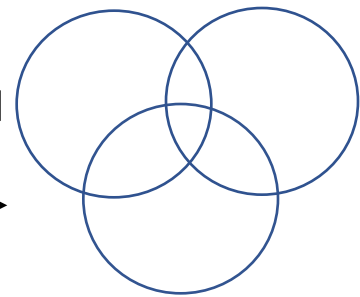
❖ Different PFASs

- ❖ Some we know a lot about (PFOA, PFOS)
 - ❖ Some we know something about (PFHxS)
 - ❖ Some we know very little about (GenX)
- Treat cells in lab
-



Assess cell response

→



Understand similarities and differences



We plan to: Understand whether there is a relationship between the physiochemical properties of PFASs, especially those found in the waters of Cape Cod, AND effects in liver cells from human donors cultured in the lab

Acknowledgments



Geoff Bothun
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NIH National Institute of
Environmental Health Sciences
Superfund Research Program

STEEP is funded under award number P42ES027726.
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STEEP
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