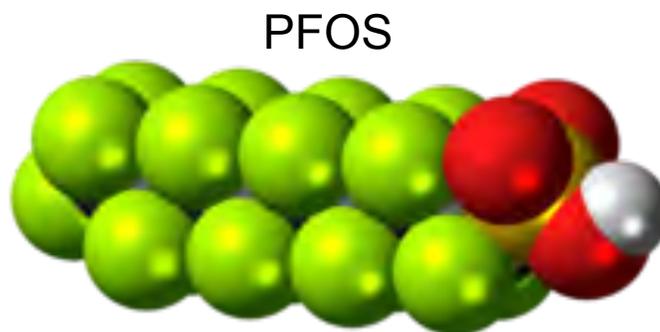


# Lipidomics for Elucidating Biomarkers and Mechanisms of Perfluorooctanesulfonic acid (PFOS) Toxicity

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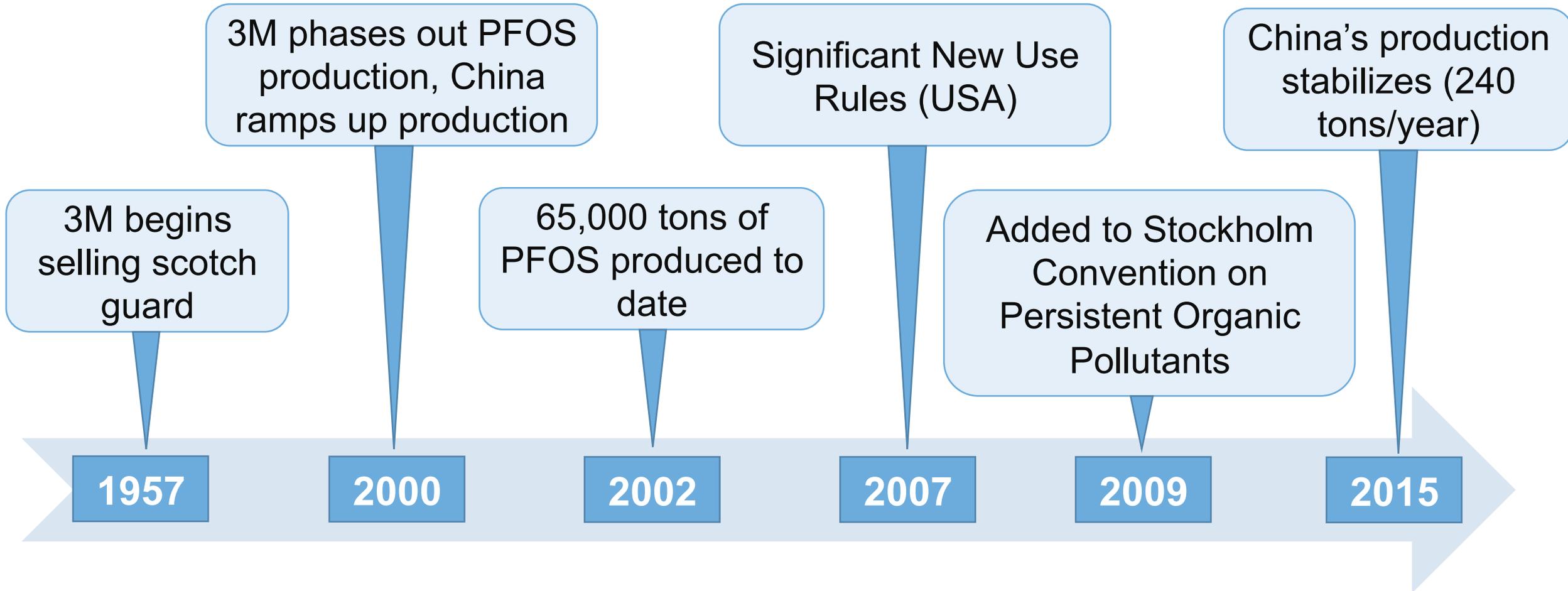


1: University of Florida, SECIM

2: NIST

3: Medical University of South Carolina

# PFOS: Production, Fate, and Transport



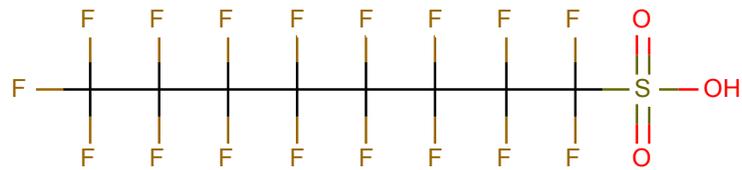
## **Environmental fate and transport:**

Degradation Water: 41 years (do not partition to sediment)

Atmospheric half life: 114 days (arctic)

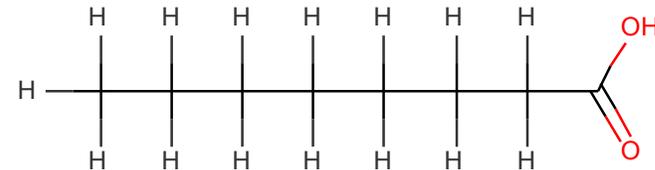
# PFOS: Biology, the Case for Lipidomics

Perfluorooctanesulfonic acid



PFOS

Octanoic Acid



FFA(8:0)

Obesogenic:

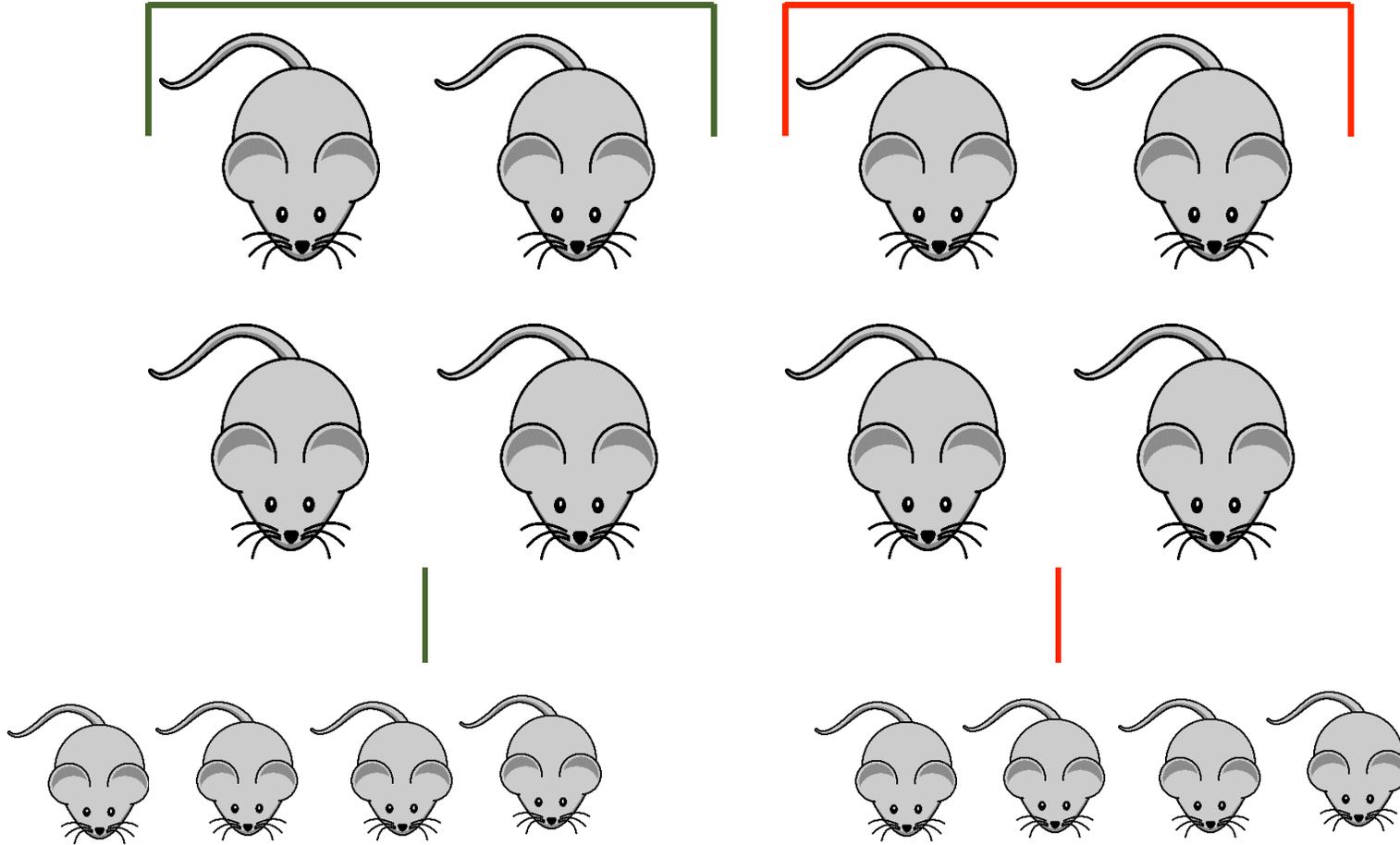
PPAR $\alpha$  inhibition:  $\uparrow$  **secretion cholesterol** and lipoproteins in liver,  $\downarrow$   **$\beta$ -oxidation of fatty acids**,  $\uparrow$  **lipid droplets**

Increased cholesterol. No true lipidomics study.

# Lipidomics: Workflow

Control

Dosed at 150ug/kg/day



After gestation and weaning (18 weeks)  
Daughter liver, fat and brain

Extraction

Acquisition

Feature  
Detection

Feature  
Identification

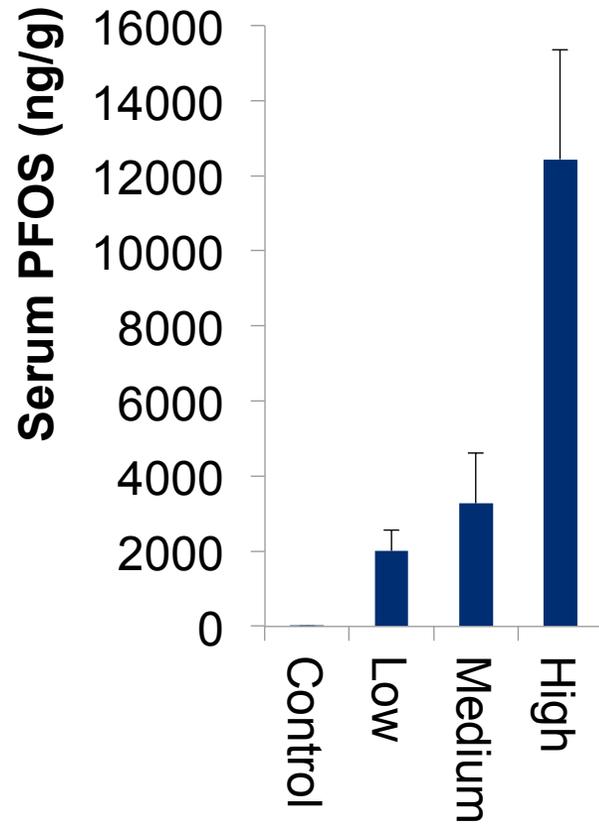
Statistics  
Biology

# PFOS Measurements

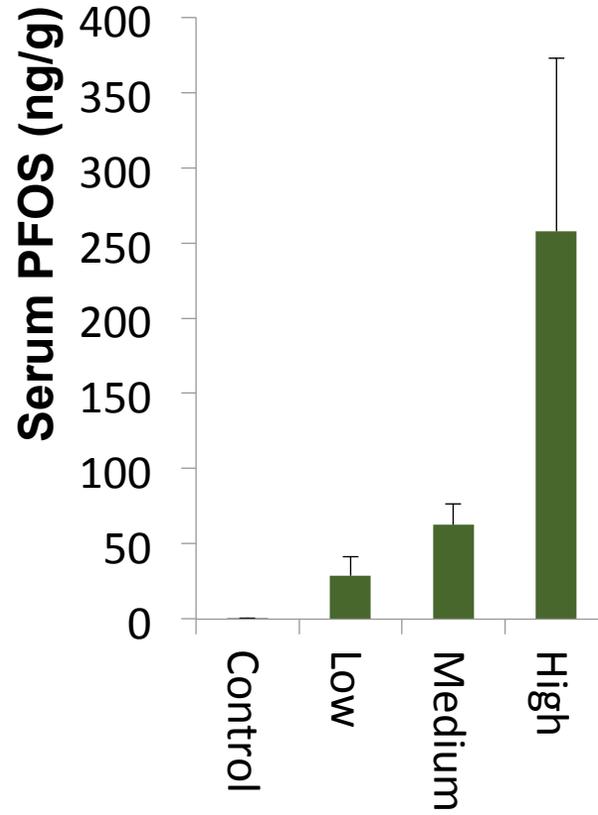
## Serum PFOS

## Liver PFOS

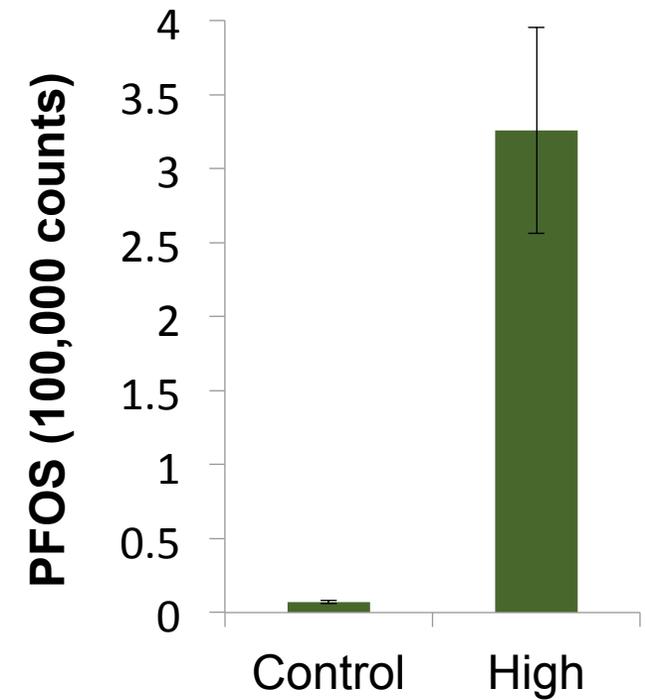
### Mothers



### Daughters (18 weeks)



### Daughters (18 weeks)



\*Brain and fat:  
no increase in PFOS

# Lipid Measurements

Brain: 112 Lipids Confirmed

3 out of 3 PAs upregulated dosed

11 out of 36 PCs downregulated dosed

4 out of 11 Cers upregulated dosed

4 out of 9 PSs upregulated dosed

