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

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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

Obesogenic:

PPARα inhibition: ↑secretion cholesterol and lipoproteins in liver, ↓β-oxidation of fatty acids, ↑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

Mothers

Daughters (18 weeks)

Liver PFOS

*Brain and fat: no increase in PFOS
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