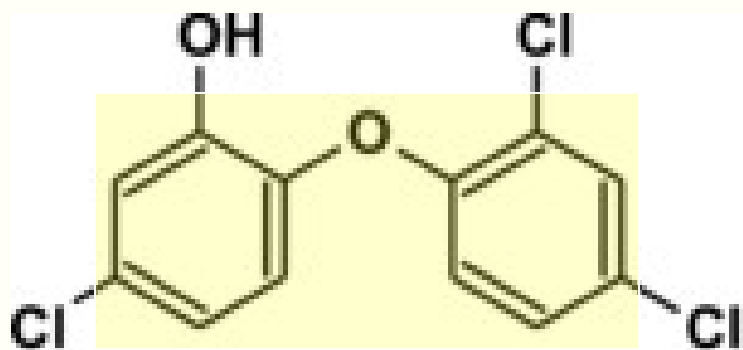


Informed Consent and Chemical Exposure from Everyday Consumer Products

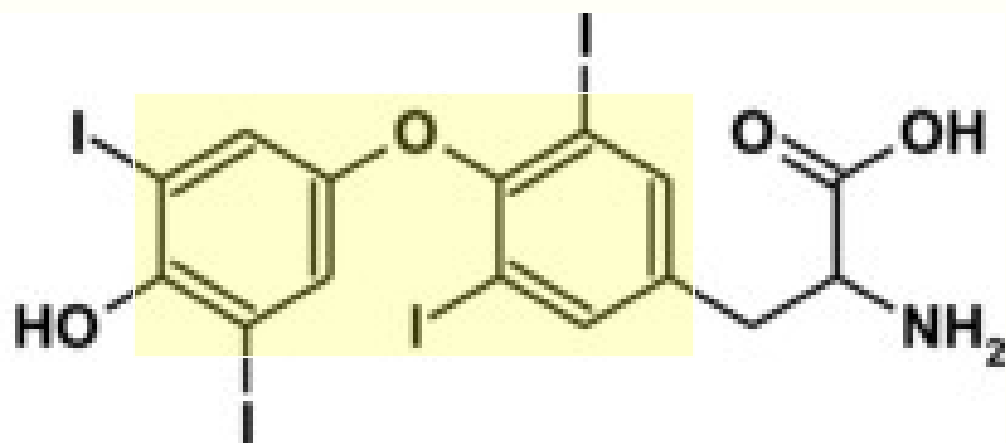
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Case Study: Triclosan



Triclosan



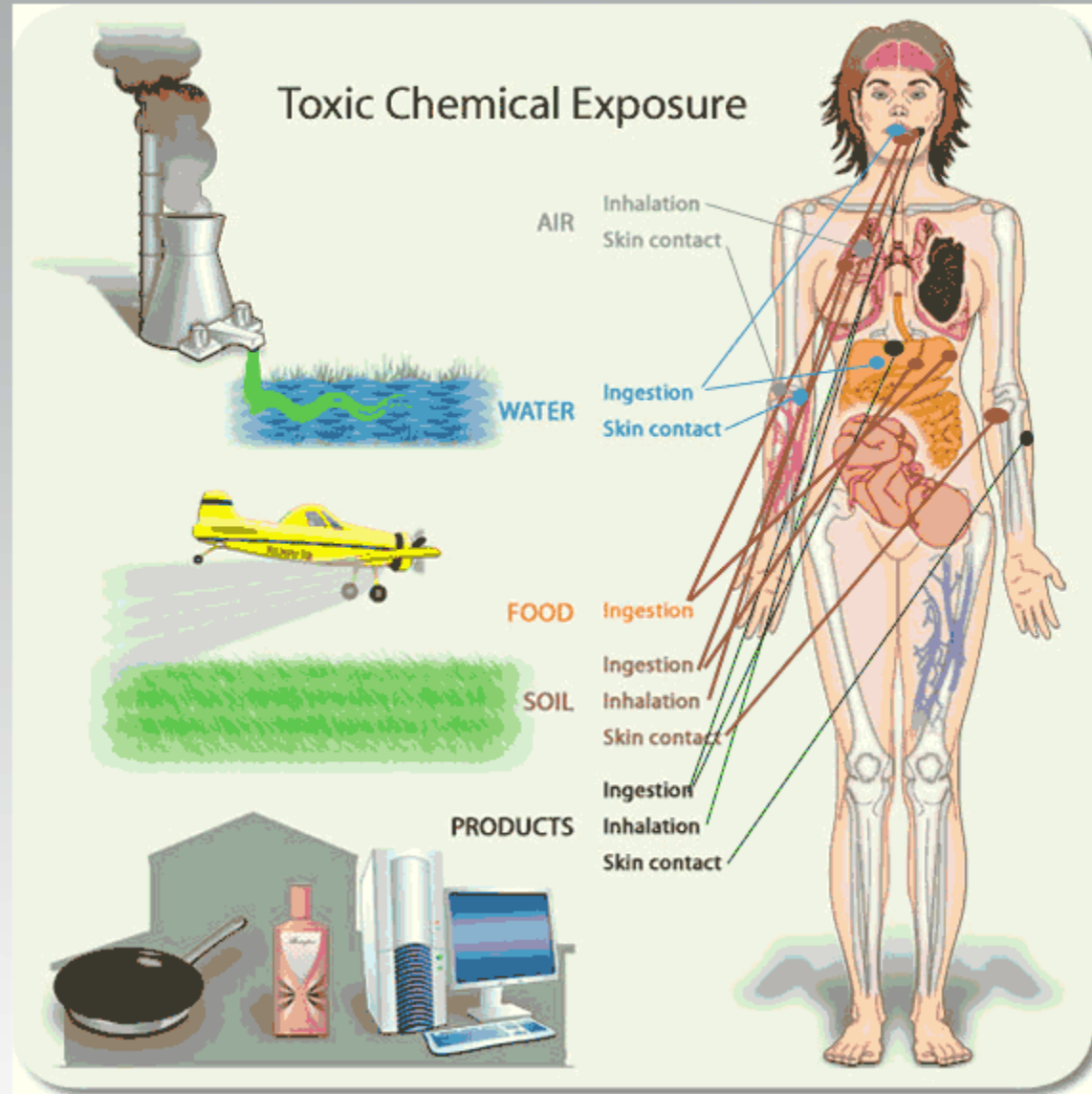
Thyroid Hormone

- Chemically similar: Both compounds are halogenated diphenyl ethers.
- Hypothesis: Triclosan mimics thyroid hormone and disrupts endocrine function.
- Triclosan was registered as a pesticide in 1969. The FDA banned it from consumer products in September 2016.



Body Burden

- We live in a chemical soup that did not exist a century ago.
- This is not acute poisoning. The effects are subtle.
- We are the test subjects in an uncontrolled biochemistry experiment.



Consumer Product Labeling

- Fair Packaging and Labeling Act of 1967
 - Manufacturers must list ingredients in the product formulation in “descending order of predominance.”
- Shortcomings
 - Trade secrets are exempt. The composition of fragrance and flavor mixtures need not be disclosed.
 - Chemical synonymy. A given chemical can have many names.



Chemical Synonymy and Consumer Perception

All of these chemical names appear in product labels. Can you match the chemical on the left with its synonym(s) on the right? Can you identify the fragrance chemicals?

Lilial
D-Limonene
Oxybenzone
2-Phenoxyethanol
Octinoxate
Benzophenone
Methyl salicylate
Octoxynol-9

Ethylhexyl methoxycinnamate
Benzophenone-3
Lemon oil Sweet birch oil
Polyoxyethylene phenyl ether
Octylphenoxypolyethoxyethanol
Butylphenyl methylpropional
Wintergreen oil
Orange flower oil



Undermining Informed Consent

- Chemical synonymy obfuscates product labels.
- Chemical synonymy can alter consumer perception of potentially harmful ingredients.
- Consumers cannot be expected to disambiguate chemical identities.
- Generic fragrance and flavor designations mask chemical identity.



- This research is made possible in part by a grant from the U.S. Institute of Museum and Library Services, Laura Bush 21st Century Librarian Program Grant Number RE-05-12-0054-12 Socio-technical Data Analytics (SODA).
- Gabb HA and Blake C. An informatics approach to evaluating combined chemical exposures from consumer products: A case study for asthma-associated chemicals and potential endocrine disruptors. *Environmental Health Perspectives*, 124(8), 1155-1165, 2016.

