



# Toxicology

## What is Toxicology?

Toxicology is the study of the harmful effects of substances on humans or animals. It is also called the "study of poisons." Any material can be a poison (or toxin); it all depends upon the dose (amount) and how it enters the body (exposure). For humans, there are three primary routes of exposure: inhalation (by breathing); oral (by eating or drinking); and dermal (through the skin).

The harmful effects of a toxin on a person depend on its strength (toxicity), exposure route, and individual biological make-up. Exposure to toxins can lead to a wide range of health effects which may be seen immediately or take years to develop.

## Who studies Toxicology?

Researchers and physicians study how exposure to toxins can cause cancers and organ disease. Lung cancer, skin cancer, breast cancer, and prostate cancer all have been associated with chemical exposure. Reproductive effects (decrease or loss of fertility) and birth defects have also been linked to toxin exposure. Human organs often targeted by toxins include the liver, kidneys, and nervous system.

## Why is it important?

How the body responds to toxin exposure depends a great deal on the individual. Certain people can be more sensitive, including the young and the old and those with weakened immune systems or livers. Males and females may respond differently to exposures and are at risk for different health effects. Continued research helps doctors and medical facilities better treat individuals if they become exposed to toxic materials.

## Frequently used Toxicology terms.

**Dose.** The dose is the amount of exposure to a potentially toxic agent. In general, the greater the dose, the greater the likelihood of a health effect.

**Exposure.** Occurs when you come in contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term (acute exposure), of intermediate duration, or long-term (chronic exposure).

**Teratogen.** A toxin that causes birth defects.

**Toxicity.** The degree to which a toxin can harm humans or animals.

## Where can I learn more?

- Agency for Toxic Substance and Disease Registry (ATSDR). <http://www.atsdr.cdc.gov/>
- Environmental Protection Agency (EPA). <http://www.epa.gov/>
- National Institute for Occupational Safety and Health (NIOSH). <http://www.cdc.gov/niosh/homepage.html>
- Centers for Disease Control and Prevention (CDC). <http://www.cdc.gov/>

