

## Glossary of Toxicological Terms and Phrases<sup>1</sup>

**absorption.** The taking up of a chemical into the body either orally, through inhalation or via skin exposure.

- **acute toxicity.** An immediate toxic response following a single or short-term exposure to an agent or dose.
- **additive effect.** When exposure to more than one toxic agent results in the same effect as would be predicted by the sum of the effects of exposure to the individual agents.
- **antagonism.** When exposure to one toxic agent causes a decrease in the effect produced by another toxic agent.
- **bioassay.** A test for measuring the toxicity of an agent by exposing laboratory animals to the agent and observing the effects.
- **biological monitoring.** Measurement of toxic agents or the results of their metabolism in biological materials such as blood, urine, expired air or biopsied tissue, to test for exposure to the toxic agents, or the detection of physiological changes that are due to exposure to toxic agents.
- **biologically plausible theory.** A biological explanation for the relationship between exposure to an agent and adverse health outcomes.
- **carcinogen.** A chemical substance or other agent that causes cancer.
- **carcinogenicity bioassay.** Limited or long-term tests using laboratory animals to evaluate the potential carcinogenicity of an agent.
- **causation.** In toxicology, the action of causing or producing an effect as a result of ingestion, inhalation, dermal absorption or other exposure route to a toxic substance.
- **chronic toxicity.** A toxic response to long-term exposure or dose of an agent.
- **clinical toxicology.** The study and treatment of humans exposed to chemicals and the quantification of resulting adverse health effects. Clinical toxicology includes the application of pharmacological principles to the treatment of chemically exposed individuals and research on measures to enhance elimination of toxic agents.
- **compound.** In chemistry, the combination of two or more different elements in definite proportions which, when combined, acquire different properties than the original elements.
- **confounding factors.** Variables that are related to both exposure to a toxic agent and the outcome of the exposure. A confounding factor can obscure the relationship between the toxic agent and the adverse health outcome associated with that agent.
- **differential diagnosis.** A physician's consideration of alternative diagnoses that may explain a patient's condition.
- **direct-acting agents.** Agents that cause toxic effects without metabolic activation or conversion.
- **distribution.** Movement of a toxic agent throughout the organ systems of the body (e. g., the liver, kidney, bone, fat and central nervous system). The rate of distribution is usually determined by the blood flow through the organ and the ability of the chemical to pass through the cell membranes of the various tissues.
- **dose, dosage.** The measured amount of a chemical that is administered at one time, or that an organism is exposed to in a defined period of time.
- **dose-response curve.** A graphic representation of the relationship between the dose of a chemical administered and the effect produced.



- **dose-response relationships.** The extent to which a living organism responds to specific doses of a toxic substance. The more time spent in contact with a toxic substance, or the higher the dose, the greater the organism's response. For example, a small dose of carbon monoxide will cause drowsiness; a large dose can be fatal.
- **epidemiology.** The study of the occurrence and distribution of disease among people. Epidemiologists study groups of people to discover the cause of a disease or where, when and why disease occurs.
- **epigenetic.** Pertaining to nongenetic mechanisms by which certain agents cause diseases such as cancer.
- **etiology.** A branch of medical science concerned with the causation of diseases.
- **excretion.** The process by which toxicants are eliminated from the body including through the kidney and urinary tract, the liver and biliary system, the fecal excretor, the lungs, sweat, saliva and lactation.
- **exposure.** The intake into the body of a hazardous material. The main routes of exposure to substances are through the skin, mouth and lungs.
- **extrapolation.** The process of estimating unknown values from known values.
- **Good Laboratory Practice (GLP).** Codes developed by the federal government in consultation with the laboratory-testing industry that govern many aspects of laboratory standards.
- **hazard identification.** In risk assessment, the qualitative analysis of all available experimental animal and human data to determine whether and at what dose an agent is likely to cause toxic effects.
- **hydrogeologists, hydrologists.** Scientists who specialize in the movement of ground and surface waters and the distribution and movement of contaminants in those waters.
- **immunotoxicology.** A branch of toxicology concerned with the effects of toxic agents on the immune system.
- **indirect-acting agents.** Agents that require metabolic activation or conversion before they produce toxic effects in living organisms.
- **inhalation toxicology.** The study of the effect of toxic agents that are absorbed into the body through inhalation including their effects on the respiratory system.
- **in vitro.** A research or testing methodology that uses living cells in an artificial or test tube system, or is otherwise performed outside of a living organism.
- **in vivo.** A research or testing methodology performed in living organisms.
- **LD50 (lethal dose 50).** The dose at which 50% of laboratory animals die within days to weeks.
- **lifetime bioassay.** A bioassay in which doses of an agent are given to experimental animals throughout their lifetime. See bioassay.
- **MTD (maximum tolerated dose).** The highest dose of an agent that an organism can be exposed to without causing death or significant overt toxicity.
- **metabolism.** The set of biochemical transformations and enzyme-catalyzed reactions which maintain the living state of cells in an organism.
- **molecular toxicology.** The study of how toxic agents interact with cellular molecules including DNA.
- **multiple-chemical hypersensitivity.** A physical condition whereby individuals react to many different chemicals at extremely low exposure levels.
- **multistage events.** A model for understanding certain diseases, including some cancers, based on the postulate that more than one event is necessary for the onset of disease.
- **mutagen.** A substance that causes physical changes in chromosomes or biochemical changes in genes.
- **mutagenesis.** The process by which agents cause changes in chromosomes and genes.
- **neurotoxicology.** A branch of toxicology concerned with the effects of exposure to toxic agents on the central nervous system.
- **no observable effect level (NOEL).** The highest level of exposure to an agent at which no effect is observed. It is the experimental equivalent of a threshold.
- **no threshold model.** A model for understanding disease causation which postulates that any exposure to a harmful chemical (such as a mutagen) may increase the risk of disease.

- **one hit theory.** A theory of cancer risk in which each molecule of a chemical mutagen has a possibility, no matter how tiny, of mutating a gene in a manner that may lead to tumor formation or cancer.
- **pharmacokinetics.** A mathematical model that expresses the movement of a toxic agent through the organ systems of the body including to the target organ and to its ultimate fate.
- **potentiation.** The process by which the addition of one agent, which by itself has no toxic effect, increases the toxicity of another agent when exposure to both agents occurs simultaneously.
- **reproductive toxicology.** The study of the effect of toxic agents on male and female reproductive systems including sperm, ova and offspring.
- **risk assessment.** The use of scientific evidence to estimate the likelihood of adverse effects on the health of individuals or populations from exposure to hazardous materials and conditions.
- **risk characterization.** The final step of risk assessment which summarizes information about an agent and evaluates it in order to estimate the risks it poses.
- **safety assessment.** Toxicological research that tests the toxic potential of a chemical in vivo or in vitro using standardized techniques required by governmental regulatory agencies or other organizations.
- **structure activity relationships (SAR).** A method used by toxicologists to predict the toxicity of new chemicals by comparing their chemical structures with those of compounds with known toxic effects.
- **synergistic effect.** When two toxic agents acting together have an effect greater than the sum of their individual effects.
- **target organ.** The organ system that is affected by a particular toxic agent.
- **target-organ dose.** The dose to the organ that is affected by a particular toxic agent.
- **teratogen.** An agent that changes eggs, sperm or embryos thereby increasing the risk of birth defects.
- **teratogenic.** The ability to produce birth defects (teratogenic effects do not pass on to future generations). See teratogen.
- **threshold.** The level above which effects will occur and below which no effects occur. See "no observable effect level."
- **toxic.** Of, relating to or caused by a poisonous substance—or a poison itself.
- **toxic agent or toxicant.** An agent or substance that causes disease or injury.
- **toxicology.** The science of the nature and effects of poisons, their detection, assessment and treatment of their effects.

---

## Notes and References

1. Adapted from the public edition of the [U.S. Federal Judicial Center Reference Manual on Scientific Evidence](#) (2000). Sources include: "*Casarett and Doull's Toxicology: The Basic Science of Poisons*" (Curtis D. Klaassen ed., 5th ed. 1996); *Biologic Markers in Reproductive Toxicology*" (National Research Council, 1989); "*Issues in Risk Assessment*" (Committee on Risk Assessment Methodology, National Research Council, 1993); *The Dose Makes the Poison: A Plain-Language Guide to Toxicology*" (M. Alice Ottoboni, 2d ed. 1991); "*Glossary of Environment Health Terms*" (Environmental and Occupational Health Sciences Institute, 1989); "*Reproductive Health Hazards in the Workplace*" (Office of Technology Assessment, U.S. Congress, 1985).

---

## Images

- a. Adapted from public domain image courtesy of [Icon Archive](#)

---

[Home](#) | [Experience](#) | [Toxic Substances](#) | [Case Studies](#) | [CV](#) | [News](#) | [About](#) | [Site Map](#) | [Contact](#)  
[Toxic Exposures](#) | [Environmental Testing](#) | [Risk Assessment](#) | [Forensic Toxicology](#) | [Causation Evaluation](#)  
[Dioxin](#) | [LNAPL](#) | [Hazardous Substances](#) | [Heavy Metals](#) | [Alcohol Toxicology](#) | [Drugs of Abuse](#)  
[Environmental Hazards](#) | [Industrial Chemicals](#) | [Hydrocarbons](#) | [Metals & Compounds](#) | [Pesticides](#)  
[Pharmaceutical Toxicology](#) | [Consumer Products](#) | [Human Health Risk Assessments](#)

## Toxicology Consultants & Assessment Specialists, LLC

**(800) 308-0080** or [send a message](#)

6450 Pine Avenue, Sanibel, FL 33957 **(239) 472-2436**

29 Fennell Street, Skaneateles, NY 13152 **(315) 685-2345**

View Dr. Sawyer's profiles on [LinkedIn.com](#), [AlmExperts.com](#) and [Jurispro.com](#)

Copyright 2017 TCAS, LLC, All Rights Reserved