

The Toxicology and Areas of Toxicologists

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Abstract

The evolution of pollutants prevention and green chemistry has given a new mission. In addition to the conventional factors of chemical layout, which awareness in large part on commercial usefulness and simplicity of synthesis, contemporary day chemists are now predicted to expand business chemical substances which can be secure to human health and the environment as well. The handiest manner for chemists to satisfy this task is to layout chemical compounds such that they will have minimum toxicity. This paper discusses numerous terminologies, regions of toxicology, mechanism of toxicology and roles of toxicologist. This paper offers certain description of toxicokinetics and kinds of poisonous outcomes.

Keywords: Toxicity; Toxins; Toxicants; Toxic effects; Adverse effects; Areas of Toxicology

Introduction [1]

Ninety two percent of all poisonings occur at domestic. The household merchandise implicated in maximum poisonings are: cleaning answers, fuels, drug treatments, and other substances inclusive of glue and cosmetics. Sure animals secrete a xenobiotic poison known as venom, generally Injected with a bite or a sting and others animals harbor infectious bacteria. A few family vegetation are toxic to people and animals. Toxicology is arguably the oldest clinical subject, as the earliest human beings had to apprehend which plant life have been safe to consume. Pollutants are produced by using flora, animals or microorganism - Phytotoxins, Zootoxins and Bacteriotoxins.

Historical

- 2700 B.C. - Chinese journals: plant and fish poisons.
- 1900-1200 B.C. - Egyptian documents directions for collection, preparation, and administration of more than 800 medicinal and poisonous recipes.
- 800 B.C. - India - Hindu medicine includes notes on poisons and antidotes.

- 50 - 100 A.D. - Greek physicians classified over 600 plant, animal, and mineral poisons.
- 50 - 400 A.D. - Romans used poisons for executions the philosopher, Socrates, was executed using hemlock
- Avicenna (A.D. 980 - 1036) Islamic authority on poisons and antidotes.
- 1200 A.D. - Spanish rabbi Maimonides writes first-aid book for poisonings, Poisons and Their Antidotes
- Swiss physician Paracelsus (1493 - 1541) credited with being "the father of modern toxicology".

"All substances are poisons: there is none which is not a poison. The right dose differentiates a poison from a remedy".

Terminologies

- Toxicant - Refers to toxic substances that are produced by or are a byproduct of human- made activities.
- Toxin - Refers to the toxic substances that are produced naturally.

- Toxic effects - Refers to the health effects that occur due to exposure to a toxic substance.
- LD50 - The amount (dose) of a chemical which produces death in 50% of a population of test animals to which it is administered by any of a variety of methods. Normally expressed as milligrams of substance per kilogram of animal body weight (mg/kg).
- Toxicity - The adverse effects that a chemical may produce.
- Hazard - Is a chemical substance, physical agent, or biological agent that can harm the health of people.
- Exposure - Exposure means contact with a hazard.

Duration and frequency are important components of exposure and contribute to dose.

1. Single exposure: Acute exposure - less than 24 hours
2. Repeated exposures are classified as:
 - a. Subacute - Repeated for up to 30 days
 - b. Subchronic - Repeated for 30 - 90 days
 - c. Chronic - Repeated for over 90 days.

Areas of toxicology (fields of specialty) [2,3]:

1. Mechanistic toxicologists
2. Descriptive toxicologists
3. Clinical toxicologists
4. Forensic toxicologists
5. Environmental toxicologists
6. Regulatory toxicologists.

Mechanistic toxicologists: Study how a chemical causes toxic effects by investigating its absorption, distribution, and excretion. They often work in academic settings or private industries and develop antidotes.

Descriptive toxicologists: Evaluate the toxicity of drugs, foods, and other products. They often perform experiments in a pharmaceutical or academic setting.

Clinical toxicologists: Usually are physicians or veterinarians interested in the prevention, diagnosis and treatment of poisoning cases. They have specialized training in emergency medicine and poison management.

Forensic toxicologists: Study the application of toxicology to the law. They use chemical analysis to determine the cause and circumstances of death in a postmortem investigation.

Environmental toxicologists: Study the effects of pollutants on organisms, populations, ecosystems, and the biosphere.

Regulatory toxicologists: Use scientific data to decide how to protect humans and animals from excessive risk [4].

Toxicokinetics

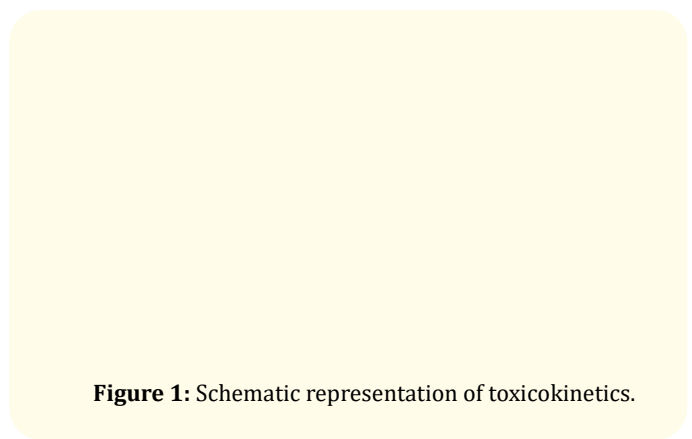


Figure 1: Schematic representation of toxicokinetics.

Conclusion

Toxicology is a charming science that makes biology and chemistry thrilling and applicable. Information how (i.e. Mechanism) something produces a poisonous impact can result in new approaches of preventing or treating chemically-related sicknesses. Many diseases are the result of an interaction between our genetics (man or woman variability) and chemicals in our surroundings. Toxicology affords an thrilling and exciting manner to apply science to essential problems of social, environmental, and public fitness significance.

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