



An Overview on Toxicology and its Branches

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Description

Toxicology is a branch of science that studies the negative consequences of chemicals, substances, and conditions on humans, animals, and the environment. Toxicology is sometimes referred to as the “Discipline of Safety” because it has evolved from a science concerned with poisons and the harmful consequences of chemical exposures to one concerned with safety. The study of chemical qualities and how they influence the body is known as toxicology. It is concerned with the harmful effects of chemicals on living creatures that come into touch with them. The detection, symptoms, aetiology, mechanism, and treatment of these compounds are all covered by toxicology. This offers vital information and expertise that may be utilised by regulatory bodies, decision-makers, and others to develop programmes and policies that restrict human exposure to toxic chemicals, avoiding or lowering the risk of illness or other negative health outcomes. Toxicology use research to forecast which chemicals will cause harm and how they will do so then disseminates that information to safeguard public health. When discussing toxicology, there are a few factors to bear in mind.

A toxicologist is a scientist who studies chemicals and other compounds to see if they are toxic or detrimental to humans, other living beings, or the environment. A toxicologist working in the pharmaceutical business would ensure that possible new medications are safe to test in human clinical trials. Toxicologists also recognise that even seemingly minor low-dose exposures can have biological significance or result in harmful health effects if the exposure is continuous or occurs during a critical developmental period.

The field of toxicology can be further divided into the following sub-specialities:

Environmental toxicology

The study of substances that contaminate food, water,

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soil, or the atmosphere is known as environmental toxicology. It also deals with harmful compounds that enter lakes, streams, rivers, and seas. This sub-discipline investigates how hazardous compounds influence diverse plants, animals, and people.

Regulatory toxicology

To create concentration-based guidelines of “safe” exposure, regulatory toxicology collects and analyses existing toxicological data. The standard is the maximum amount of a chemical to which a person may be exposed without harming their health.

Clinical toxicology

Clinical toxicology is the study of diseases and disorders caused by short or long-term exposure to harmful substances. Emergency room physicians who work as clinical toxicologists must be conversant with the symptoms of exposure to a wide range of toxic chemicals in order to provide proper treatment.

Descriptive toxicology

Descriptive Toxicology is focused with collecting toxicological data from animal experiments. These studies are performed to determine the amount of a substance that can cause disease or death. Information from this research is used by the US Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA) to determine regulatory exposure levels.

Mechanistic toxicology

Mechanistic Toxicology studies how harmful compounds produce their effects. The size of the molecule, the specific tissue type or cellular components affected, and whether the substance is easily dissolved in water or fatty tissues are all important factors to consider when trying to figure out how a toxic substance causes harm and whether the effects seen in animals can be expected in humans.