



Toxins are Poisons Naturally Produced by Living Organisms

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DESCRIPTION

Poisoning, intoxication, or increased toxicity is the conversion of a compound to a more toxic form in an organism or substrate such as soil or water. Transformations are affected by both enzymatic metabolism and abiotic chemical reactions in living organisms. Parent drugs are usually less active, but both parent drugs and their metabolites are chemically active and can cause toxicity, mutagenesis, teratogenesis, and carcinogenesis. Various enzyme classes such as P450 monooxygenases, epoxide hydrolases, and acetyltransferases can catalyze processes intracellularly, mainly in the liver. Non-toxic source chemicals are commonly referred to as protoxins. Toxicity is generally undesirable, but in some cases is necessary for the *in vivo* conversion of prodrugs into metabolites with desirable pharmacological or toxicological activities. Codeine is an example of a prodrug that is metabolized in the body to form morphine and the drug codeine-6-glucuronide. Heavy metals are also a source of poisoning. Heavy metals such as lead, nickel, aluminum, cobalt, and copper can act as pseudo elements in biological systems. The toxicity of heavy metals depends on the uptake of compounds present in the environment. There are two types of illness, acute and chronic, depending on exposure and ingestion of heavy metals. When a person begins to accumulate heavy metals, it leads to chronic diseases such as liver failure and heart disease. The use of pesticides is also one of the causes of his poisoning. Pesticides containing elements such as calcium, lead, copper, and zinc remain in the soil after use and affect soil fertility. In general, there are five types of toxicity: Chemical, biological, physical, radioactive, and behavioral. Microorganisms and parasites that cause disease are broadly toxic but are commonly referred to as pathogens rather than toxins. The bio toxicity of pathogens can be difficult to measure as the threshold dose may be a

single organism. Viruses, bacteria, or worms could theoretically multiply and cause serious infections. If the host has an intact immune system, the organism's intrinsic toxicity is offset by the host's response. Effective toxicity is a combination. In some cases, for example, cholera toxin, the disease is caused primarily by abiotic substances secreted by organisms rather than by the organisms themselves. It is commonly called a toxin when it is produced by an animal, and as a poison when produced by an animal. Physical toxins are substances that interfere with biological processes because of their physical properties. Examples include coal dust, asbestos fibers, and finely divided silicon dioxide, all of which can be fatal if inhaled. Caustic chemicals are physically toxic because they destroy tissue, but are not directly toxic unless they directly interfere with biological activity. Water can act as a physical poison at very high doses because too much water dramatically reduces the concentration of life ions in the body. A suffocating gas displaces oxygen in the environment. It is therefore an inert, chemically non-toxic gas, although it can be considered a physical toxicant. Radiation can be toxic to living organisms. Behavioral toxicity refers to essentially therapeutic drug level undesirable effects that are clinically demonstrated for a particular disorder. These undesirable effects include but are not limited to, anticholinergic effects, alpha-adrenergic blockade, and dopaminergic effects. The discipline of evidence based toxicology seeks to transparently, consistently, and objectively assess the scientific knowledge available to answer toxicology questions. Enhances the effect of evidence based toxicology has the potential to address the toxicology community's concerns about the limitations of current approaches for evaluating state of the art technologies. These include concerns about transparency in decision making, integration of different types of evidence, and assessment of bias and reliability. Evidence based toxicology has its roots in a larger movement toward evidence based practice.

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