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Perspective

Effect of xenobiotic metabolism on environment

Doris Guentzel*

Department of Microbiology, Shahid Chamran University, Ahvaz, Khuzestan, Iran.

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DESCRIPTION

A xenobiotic is a chemical found in an organism that is not naturally produced or expected to exist within the organism. It can also cover existing objects at much higher concentrations than usual. Natural compounds can also be xenobiotics if taken with another organism, such as the extraction of human natural hormones by fish from the bottom of the river where plant waste is released, or the chemical protection produced by other organisms as a protection against predators.

Xenobiotic metabolism

The body eliminates xenobiotics through xenobiotic metabolism. This involves blocking the activity and release of xenobiotics and occurs mainly in the liver. Hepatic enzymes are responsible for the metabolism of xenobiotics by first opening it, and then combining a second active metabolite with glucuronic acid, sulfuric acid, or glutathione, followed by the excretion of bile or urine. An example of a group of enzymes involved in xenobiotic metabolism is hepatic microsomal cytochrome P450. These xenobiotic enzymes are very important in the pharmaceutical industry because they are responsible for the breakdown of drugs. A version with this unique cytochrome P450 system Drosophila mettleri, which uses xenobiotic resistance to exploit a wide range of reproduction that includes both soils moistened with necrotic exudates and necrotic plots themselves.

Although the body is able to eliminate xenobiotics by reducing them to a less toxic state through xenobiotic metabolism and releasing them, it is also possible for it to be converted into a more toxic form in some cases. This process is called bioactivation and can lead to changes in the structure and function of the microbiota. Exposure to xenobiotics can interfere with the formation of the microbiome community, by increasing or decreasing the size of certain microbial numbers depending on. Functional changes vary depending on the substance and may include increased expression in genes involved in response to stress and antibiotic resistance, changes in the levels of metabolites produced, etc.

Xenobiotics in the environment

Some xenobiotics are resistant to degeneration. Xenobiotics such as polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and trichlorethylene (TCE) accumulate in the environment due to their uncontrolled properties and become a natural concern for their toxicity and accumulation. This is especially true in the underground and water resources, as well as in biological systems, which have the potential to affect human health. Some of the main sources of pollution and xenobiotic emissions in the environment come from large industries such as pharmaceuticals, fossil fuels, pulp and paper mixes and agriculture. For example, they may be organochlorides such as plastics and pesticides, or natural chemicals such as polyaromatic

*Corresponding author. Doris Guentzel, doris@guentzel.ac.ir.

hydrocarbons (PAHs) and other components of crude oil and coal.

Microorganisms may be an effective solution to the issue of environmental degradation through xenobiotics; a process known as bioremediation. Microorganisms are able to adapt to the xenobiotics introduced locally through the transfer of horizontal genes, in order to utilize compounds such as energy sources. This process may also be modified to use metabolic mechanisms of microorganisms to reduce harmful xenobiotics under certain natural conditions at a desirable rate. Bioremediation techniques include both microorganism's genetic engineers and xenobiotic dissociation that naturally occur in degradation. Research has been done to identify genes responsible for the ability of microorganisms to cut down a particular xenobiotic and suggest that this research be used to develop genetic engineering for this purpose. Not only can current pathways be developed to be exposed to other organisms, but the construction of new pathways is a viable option.

Many xenobiotics produce various biological effects, which are used when detected using bioassay. Before they can be registered for sale in most countries, xenobiotic pesticides must be thoroughly tested for hazardous substances, such as human toxins, environmental toxins, or environmental degradation. For example, during the registration process, herbicide, cloransulam-methyl was found to decompose rapidly in the soil.