

Toxic Agents and Substances

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Toxic Agent

Toxic agent is anything that can produce an adverse biological effect. It may be chemical, physical, or biological in form. Toxic agents may be: chemical (such as cyanide), physical (such as radiation) and biological (such as snake venom).

Toxic substances are common correlates of criminal behavior either ingested voluntarily or through exposure in the environment.

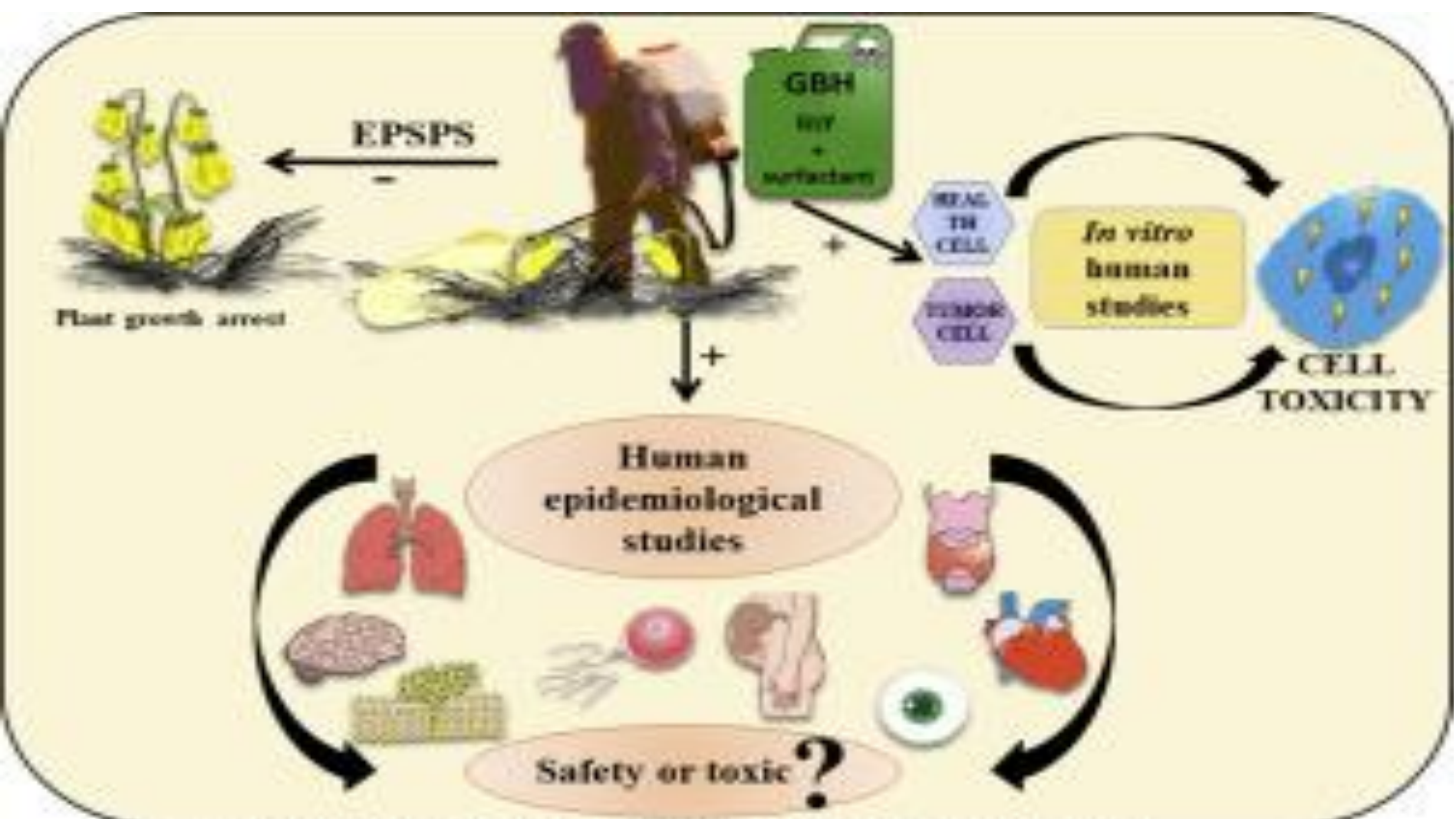
Toxic substance is simply a material which has toxic properties.

Classification of Toxicants

Toxic agents are classified in number of ways depending on the interests and needs of the classifier.

There is no single classification applicable for the entire spectrum of toxic agents; therefore, combinations of classification systems based on several factors may provide the best rating system.

Classifications of poisons may take into account both the chemical and biological properties of the agent; however, exposure characteristics are also useful in toxicology.



GBH: Glyphosate based herbicide, GLY: Glyphosate, EPSPS: L-alloisoylcholine-3-phosphate synthase.

Sources of Toxicants

- Plant toxins
- Animal toxicants
- Mineral toxicants
- Synthetic toxicants

Physical state of Toxicants

- Gaseous toxicants
- Liquid toxicants
- Solid toxicants
- Dust toxicants

Usage

- Insecticides,
- Fungicides
- Herbicides
- Rodenticides
- Food additives

Factors Determining Adverse Effect

- ❖ Intrinsic toxicity
- ❖ Dose
- ❖ Exposure conditions
- ❖ Response of host

Toxic substances may not always have a constant composition. For example, the composition of gasoline varies with octane level, manufacturer, time of season, etc. Toxic substances may be organic or inorganic in composition.

Intrinsic Intensity

Material Safety Data Sheets are available for most chemicals. US Environmental Protection Agency has a site called IRIS with plenty of data on chemical properties. Stability means that some compounds might change under influence of light, water, acids or other external factors.

Dose

Dose by definition is the amount of a substance administered at one time. However, other parameters are needed to characterize the exposure to xenobiotics.

The most important are the number of doses, frequency, and total time period of the treatment. Some examples: 500 mg Aspirin as a single dose 500 mg Penicillin every 8 hours for 10 days 15 mg DDT per day for 60 days.

Exposure Conditions

- Routes of exposure routes of exposure
- Frequency & duration of exposure frequency & duration of exposure
- Mixed exposures mixed exposures
- Environmental circumstances

Response of Host

- Detoxification
- Bioactivation

References

- <https://www.youtube.com/watch?v=tJ4ATgW8iBw>
- https://www.youtube.com/watch?v=aw0_neqg3Eo
- <https://www.youtube.com/watch?v=U6xxK7E3tkc>