



Working In the Laboratory and Your Health

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Many factors including stress and disease can affect a person's health. It is known however that some exposures to external factors in the home and workplace can affect health.

Laboratory Hazards

Hazards in the laboratory can affect a workers health if they are absorbed into the body.

These hazards include:

- Certain chemicals
- Certain drugs
- Certain biological materials *
- Excessive radiation *

A hazard can cause one or more health effects depending on the exposure. Hazards may not affect every worker in the same manner. When a chemical is absorbed into the body, metabolic processes can lower the toxicity by converting it to a less toxic form. Chemicals cause toxicity by reacting with a range of functions within living systems.

Chemicals have varying toxicity to humans depending on which function they interact with. The Occupational Safety and Health Administration sets exposure standards which it is expected that the average person can be exposed to without harmful effects.

Toxic Effects of Chemicals

- Corrosive effects:

Acids cause harm by reacting with and destroying tissue. Lower exposures can result in inflammation and rashes. Hydrofluoric acid can also be absorbed into the body and disrupt calcium balance which is essential to controlling the heart.

- Central Nervous System effects:

Chemicals such as petroleum solvents and some gases can disrupt the central nervous system. The intoxication can result in altered consciousness and respiratory depression. Many insecticides also disrupt the nervous system.

- Asphyxiant effects:

Asphyxiants interfere with the body's ability to utilize oxygen. Simple asphyxiants lower the oxygen in air to unsafe levels without other effects. Chemical asphyxiants prevent transport of oxygen by the blood (carbon monoxide) or cellular uptake of oxygen (cyanide).

- General Toxic effects:

General toxicants can interfere with specific bodily functions to impair health. Some, such as crystalline silica, can cause lung damage. Others such as chlorinated solvents may cause liver damage.

- Reproductive toxins:

Many factors can affect a woman's reproductive health. Some chemicals can cause birth defects or miscarriages.

Routes of Exposure & Precautions

Harmful substances can enter your body through several routes.

- Inhalation

Substances in the air can be easily absorbed into the body via the lungs. This is why smoking is strongly discouraged.

Always handle volatile chemicals at least six inches inside a properly operating chemical fume hood with the sash placed between you and the material.

- Skin contact

Solvents can penetrate the unprotected skin and be absorbed into the body.

Wear appropriate personal protective equipment including impermeable gloves, safety glasses or goggles, and lab coat. The specific protective equipment worn should be tailored to the task and can include face shields, rubber aprons, or other equipment as recommended.

- Ingestion

Accidental ingestion or hand to mouth contact with contaminated hands can contribute to ingestion of substances.

Prevent accidental chemical ingestion or contamination by practicing basic hygiene. Never eat, drink or make other hand to mouth contact in the laboratory.

Protect yourself

Know what you are exposed to at home and work. Material Safety Data Sheets (MSDSs) are available for most chemicals and products you work with. Environmental Health and Safety can provide MSDSs and other detailed information on material you may work with. Our website at www.ehs.psu.edu provides links to sites providing MSDS information and information on laboratory safety. Follow recommended handling procedures for everything you may be exposed to.

Utilize exposure controls such as fume hoods in labs, proper personal protective equipment, and handling procedures. Overall existing exposures in laboratories are generally well below levels of concern for laboratory workers.

You may contact Environmental Health and Safety at 814 865-6391 for information or an evaluation of your exposure potential. If you are pregnant or are considering becoming pregnant and have any questions about exposure potential in your work place an evaluation will be conducted and your privacy will be protected, upon request.

* Call EHS for more specific information on biological and radiological hazards

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