

Working in laboratories on a day to day basis can desensitize many employees from the hazards that are present in a lab. So, it is always good to have a refresher!

Running a lab is a challenge, to say the least. Between sample preparation, **HPLC/UHPLC solvent preparation**, loading the autosampler, pipetting, pouring, and mixing for research experiments—safety can easily be overlooked. So, it is important to understand to the required **Occupational Safety and Health Administration (OSHA)** programs and recognize hazards that can help to identify and minimize common laboratory safety issues.

Here are several types of hazards that can be easily recognized. To better recognize problems, most hazards fall into three main categories: chemical, biological, and physical.

Chemical hazards can be comprised of solvents, cleaning agents, disinfectants, drugs, anesthetic gases, paints, and compressed gases. Exposures to chemical hazards can happen both during use and with poor storage.

Organic solvents such as acetonitrile, methanol, methylene chloride, trifluoroacetic acid, chloroform, hexane, and ethyl acetate are commonly used in **HPLC analysis**. Common lab practices of covering these solvent containers with paraffin film or aluminum foil have not been sufficient in blocking the vapors and fumes from escaping the containers into laboratory air. For laboratory worker and lab visitor safety, HPLC/UHPLC solvent bottles and waste containers must be securely sealed. The most secure way to prevent dangerous vapors and gases from leaving solvent containers is to use purpose-built mobile phase and solvent waste safety caps.

Biological hazards consist of potential exposures to allergens, infectious zoonotics, and

experimental agents such as viral vectors. Animal research facilities contain several of the most important health hazards, yet they can be frequently overlooked.

And third, **physical hazards**, are typically the most obvious. They include issues like slips and falls from working in wet locations, as well as lifting, pushing, pulling and repetitive tasks carried out incorrectly. However, there are some physical hazards that can go unnoticed, such as electrical, mechanical, acoustic, and thermal in nature.

Let's dive into each hazard a little more to reach a greater understanding!



Chemical Hazards

Toxic

Using chemicals in a lab is inevitable, but so can be injury or harm if the chemicals are misused or mishandled. Thanks to OSHA, there are two important standards to help minimize potential issues.

1. **Hazard Communication standard** (29CFR1910.1200)- Deals with requirements for employers to inform and train employees on non-laboratory use of chemicals. This applies to pump oil, Chromerge, or liquid nitrogen that would be used in dewars.

2. The **“OSHA Lab Standard”** (29CFR1910.1450)- requires laboratories to identify hazards, determine employee exposures, and develop a chemical hygiene plan (CHP) including standard operating procedures.



Biological Hazards

There are several factors that fall under biological hazards such as microbes, recombinant organisms, and viral vectors. This also includes biological agents introduced into experimental animals. Biological hazards are typically forgotten about since there is little evidence of contamination. However, to avoid contamination, lab workers must ensure that procedures are conducted safely. The U.S. Department of Agriculture, the Department of Homeland Security, and the Department of Health and Human Services are just a few federal agencies that also regulate things such as recombinant DNA, acute toxins, and select agents.



Physical Hazards

Most research facilities have a sizeable number of physical hazards, such as electrical safety hazards, ergonomic hazards associated with manual material handling and equipment use, handling sharp objects, and basic housekeeping issues.

Lab workers need to be careful of repetitive awkward motions and postures that might lead to injuries over time. Remember, if you're in pain, there is something wrong. Step back from whatever you are doing, be it eluting a column in a fume hood, working for extended periods in a biosafety cabinet, or looking at slides on a microscope, and readjust yourself to keep your muscles and body safe. Conduct work with a neutral and balanced posture.

It is also important to understand that many injuries happen from poor housekeeping. It is easy to avoid the common accidents such as slips, trips, and falls. Your area should be kept clean and organized to avoid injuries. Things like having bags, containers, and bundles packed correctly by stacking in tiers, block, interlocked, and limited in height, so they are stable and secure against sliding or collapsing.

Besides falling in the workplace, electrical hazards are one of the most important incidents to avoid. This can simply be done by equipping all electrical power outlets in wet locations with ground-fault circuit interruptions. These are designed to trip and break the circuits when a small amount of current begins flowing to ground. Also, properly using a flexible extension cord and making sure the plug ends are in good condition can save a lot of lab workers from injury.

Research laboratories present many challenges and hazards that most workplaces don't. So, it is smart to refresh yourself and your staff on safety procedures (no matter how boring the meeting will be) and make sure that everything is up to OSHA standards.

Phenomenex takes potential chemical hazards in our customer's labs seriously. We want to make sure that all lab workers are safe. So, we have developed new **SecurityCAP LC Solvent Safety Products** to better ensure the safety of those in the lab. The SecurityCAP mobile phase and solvent waste safety caps prevent dangerous vapors and gases from leaving HPLC/UHPLC solvent reservoirs. Over time, these chemicals can have a negative impact on the health of all employees and visitors in the lab. When lab safety and dependable results are a priority, you need SecurityCAPs!



To learn more about SecurityCAPs and how they can help improve the safety of you and your fellow colleagues, check it out here: www.phenomenex.com/securityCAP

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Summary



Article Name

Laboratory Hazards and Risks—And How You Can Avoid Them

Description

This article covers the top laboratory hazards and risks that can be easily prevented by following OSHA standards and recognizing the everyday risks.