## Information

General Safety in Laboratories

## Applicability

This policy applies to the University Community (administrators, faculty, staff, and students) and visitors.

## Administrative Authority

Senior Associate Vice President for Operations

## Responsible Unit

Environmental Health & Safety
Louisville, KY 40292
502-852-6670
dehsubm@louisville.edu

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## History

Revision Date(s):

Reviewed Date(s): August 10, 2022

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## Categories

# Reason for Policy:

The objective of this policy is to eliminate, or reduce to the lowest feasible level, employee exposures to chemicals used in University of Louisville laboratories.

Recognizing the importance and widespread use of research involving many classes of chemicals, these guidelines will attempt to facilitate this objective by defining responsibilities and procedures for essential laboratory safety.

# Statement:

The use of chemicals at the University of Louisville shall be planned and performed in a manner to ensure that a safe and healthy environment is maintained.

### General Rules for Laboratory Safety

Safety should be thought about, acted upon, and encouraged until it becomes a habit for all workers. Every laboratory worker shall observe the following rules:

### Preventive Measures

Know the safety rules and procedures that apply to the work that is being done. Determine the potential hazards and appropriate safety precautions before beginning any new operations. Be alert to unsafe conditions and actions. Call attention to them so that corrections can be made as soon as possible.

### Equipment

- Know the location and use of the emergency equipment (fire blanket, safety shower/eyewash) in your area. Know how to obtain additional help in an emergency and be familiar with emergency procedures.
- Use equipment only for its designated purpose.
- Only use a fire extinguisher if you are trained to do so. The University prefers that you evacuate the area and allow physical plant and other trained individuals to fight the fire.
- Carefully position and secure any apparatus used for hazardous reactions in order to permit manipulation without moving the apparatus until the entire reaction is complete.
- Use mechanical devices for all pipetting procedures; never use mouth suction.

### Personal Safety

- Protect the face, skin, and eyes, at all times by wearing appropriate protective clothing and equipment to avoid direct contact with the chemical (i.e. chemical goggles, gloves, apron or lab coat, etc.). Remove these items before leaving the laboratory. Do NOT wear lab coats or other potentially contaminated protective equipment out of the lab into elevators, during lunch breaks, or launder lab coats at home.
- Sandals, open-toed shoes, and shorts should never be worn in a laboratory in which hazardous chemicals are in use.
- All workers with long hair must tie hair away from moving, rotating equipment.
- Do not eat, drink, smoke, or apply cosmetics in the laboratory or in any location where chemicals or other hazardous agents are used or stored.
- Never drink out of laboratory glassware. Glassware that has been washed with chromic acid can retain and leach this toxic chemical into contents of the glassware. Even small amounts of chromium salts are hazardous to your health.
- Remain out of the area of a fire or personal injury unless it is your responsibility to help meet the emergency.
- Avoid distracting any other worker. Practical jokes or horseplay will not be tolerated at any time.
- Do not pipette anything by mouth.
- Post emergency phone numbers near lab phones and on the lab doors.
- Conduct procedures that involve hazardous volatile chemicals or that may result in the production of aerosols or dangerous gases in a properly functioning chemical hood. If this is not feasible, call the DEHS Lab Safety Coordinator at 852-2830 for a hazard assessment.
- Be alert to unsafe conditions, and call attention to them so that corrections can be made.
- Consider any unlabeled chemical solution hazardous until it is identified.
- Discard chemicals that have changed in color or appearance using approved disposal procedures.
- Allow only authorized personnel in the laboratory.
- Wash hands frequently - always before leaving the laboratory and prior to eating, smoking, applying cosmetics, etc.
- Remove gloves before leaving the laboratory. Do NOT wear gloves out of the lab into elevators or while typing on lab computers.

**Working Alone In Laboratories**

**Prior approval of the Principal Investigator is required for working alone after hours.**

Generally, it is prudent to avoid working alone at the bench in a laboratory. Individuals working in separate laboratories outside of working hours should make arrangements to check on each other periodically, or ask security guards to check on them. Experiments known to be hazardous should not be undertaken by a worker who is alone in a laboratory. Under unusually hazardous conditions, special rules may be necessary. When working with acutely toxic materials, never work alone in a laboratory.

## Unattended Laboratory Operations

**Prior approval of the Principal Investigator is required for unattended laboratory operations.**

Laboratory operations involving hazardous substances are sometimes carried out continuously or overnight with no one present. It is the responsibility of the worker to design these experiments so as to prevent the release of hazardous substances in the event of interruptions in utility services such as electricity, cooling water, and inert gas. Laboratory lights should be left on, and signs should be posted identifying the nature of the experiment and the hazardous substances in use. If appropriate, arrangements should be made for other workers to periodically inspect the operation. Information should be posted indicating how to contact the responsible individual in the event of an emergency.

## Laboratory Housekeeping

### General

As you walk through a well-kept laboratory, you should note a clean and orderly workplace.

- Floors should be free of hazards. Never leave carelessly discarded objects, dropped objects, or spilled material on the floor.
- Always keep tables, chemical hoods, floors, aisles, and desks clear of all material not being used.
- There should always be two clear passageways to exits.

- There should always be clear space around safety showers or eyewashes, fire extinguishers, and electrical controls.
- Sink traps and floor drain traps should be filled with water at all times to prevent the escape of sewer gases into the laboratories.
- Any frequently used bench apparatus should be kept well away from any edges and secured whenever possible.
- Clean work areas upon completion of an experiment or at the end of each day.
- Bench tops and bench liners should be free of visible contamination.
- Reduce the risk of slips, trips, and falls by cleaning up liquid or solid spills immediately, keeping doors and drawers closed and passageways
- Clear of obstructions.

**Storage**

- Sharp or pointed tools should be properly sheathed or stored.
- Clothing should be hung in proper locations and not draped over equipment or benches.
- Less commonly used equipment should be kept in storage.
- Do not store chemical containers on the floor.
- Do not store excess cardboard boxes, equipment boxes, Styrofoam, etc. under lab benches, on shelves, or above shelves/cabinets throughout the lab.
- This can be a safety as well as a fire hazard.

**Laboratory Safety Assessments**

While DEHS conducts periodic assessments and consultations of laboratories, Principal Investigator, or designee, performs lab safety self-assessments on an annual basis. A printable version of the self-assessment is available on the Lab Safety Assessment Program website, with instructions on documenting performance of the lab safety assessment in BioRAFT.

**Inspections by Regulatory Agencies**

Contact the DEHS office immediately if a state or local EHS regulatory agency arrives to inspect a University facility.

There may be occasions when a representative of a state or local regulatory agency may come to University laboratories to audit compliance with various environmental health and safety regulations. The agencies include the Kentucky Division of Waste

Management, the Kentucky Occupational Safety and Health Program and the Louisville and Jefferson County Metropolitan Sewer District. In order to assure all appropriate information is provided to regulatory compliance officers during an inspection it is necessary that a representative of the DEHS be present during a regulatory inspection.

# Procedures:

See Laboratory Safety Manual (PDF) for complete procedures.

# Responsibilities:

### Chairperson

The chair has primary responsibility for the safe management of laboratories in a department, including compliance with all applicable regulatory requirements, and shall require that all laboratories in his/her charge be safely managed. He/she may delegate to other departmental faculty or staff members the authority to oversee these activities.

As the safety and well-being of students, faculty, and staff come above all other considerations at the University of Louisville, the chair shall ensure that no experiment that subjects personnel to excessive risk is permitted, no matter how valuable the experimental information might be.

### Faculty (Principal Investigator)

- Acquire the knowledge and information needed to recognize and control hazards in the laboratory;
- Ensure completion of the lab-specific sections of the model Chemical Hygiene Plan, including Standard Operating Procedures for highly hazardous substances. Review these documents annually and revise as required. Ensure access to the lab specific Chemical Hygiene Plan for all lab personnel working with hazardous chemicals;
- Ensure an inventory of hazardous chemicals present in the lab is maintained and that Material Safety Data Sheets are readily available to all lab personnel

working with hazardous chemicals;

- Evaluate safety and health hazards connected with proposed experimental procedures, select and employ laboratory practices, engineering controls and personal protective equipment that reduce the potential for exposure to chemicals to the lowest feasible level, and plan for handling of any resultant emergencies;
- Provide information and training to those employees for whom the investigator is responsible. This training should center on health and safety hazards unique to the specific laboratory, which are not included in the scope of the basic laboratory safety training. Special emphasis shall be made for highly hazardous substances, which require written SOP's delineating laboratory practices, engineering controls, personal protective equipment, and procedures for dealing with spills and accidents;
- Require adherence to guidelines relating to safe usage of approved apparatus and the acquisition, use, and storage of hazardous materials and the proper disposal of hazardous waste. Supervise the safety performance of staff to ensure that required laboratory practices, engineering controls, and personal protective equipment are employed;
- Be alert to and informed of federal, state, and local regulations relating to each particular laboratory operation;
- Arrange for immediate medical attention for personnel and reporting to the DEHS any accident that results in:
    - Injury requiring medical attention.
    - Fire or explosion.
    - Ingestion or inhalation of dangerous amounts of chemicals or poisons.
    - Any incident resulting in overexposure of personnel or danger of environmental contamination by chemicals.
- Assist representatives of the DEHS investigating accidents;
- Investigating and reporting to the DEHS any problems pertaining to operation and implementation of laboratory practices and engineering controls; and
- Obtain approval, when required, from the Department of Environmental Health and Safety to conduct a high-risk operation involving chemical agents.


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**All Laboratory Personnel**

Be aware of his or her individual safety responsibilities.

- Participate in required training activities.
- Know and comply with safety guidelines, regulations, and procedures required for the task assigned.
- Plan and execute laboratory operations in a manner that does not constitute a hazard to themselves or their co-workers.
- Understand the selection, use and limitations of personal protective equipment (PPE). When a procedure requires the use of PPE, use it properly.
- Look out for the safety of others in the laboratory, including visitors.
- Report unsafe conditions to the principal investigator, immediate supervisor, or DEHS.
- Know and follow emergency procedures, including the location and proper use of emergency equipment.
- Report to the principal investigator or immediate supervisor and DEHS all facts pertaining to every accident or near-miss that results, or may result in, any human injury, exposure or the uncontained spill or release of chemicals, keeping in mind that the primary purpose of accident investigation is accident prevention, not the assignment of blame or culpability.

**Department of Environmental Health And Safety**

- Assist the principal investigator in the selection of laboratory practices, engineering controls, and personal protective equipment;
- Provide technical guidance to personnel at all levels of responsibility on matters pertaining to laboratory safety;
- Review the laboratory safety web page as needed for updates and revisions, ensuring at least annual review of the model chemical hygiene plan;
- Provide basic laboratory safety/chemical hygiene training for University personnel;
- Perform periodic inspection of laboratories to assess compliance with laboratory safety policies and procedures;
- Work with University architects (Planning, Design, and Construction) and Physical Plant personnel in evaluating design parameters for laboratory

facilities;

- Provide for the periodic testing of laboratory chemical hoods;
- Investigate all reported accidents that result in the injury or exposure of personnel or chemical release and recommending corrective action to reduce the potential for recurrence;
- Supervise decontamination operations where accidents have resulted in significant contamination of laboratory areas;
- Provide services for the routine disposal of hazardous substances;
- Recommend to the administration the means to meet government compliance with respect to hazardous materials; and
- Provide health and safety review of grant proposals involving the use of hazardous chemicals when required by University Committees or outside granting agencies.