**Safe Laboratory Practices**

Every PI/Supervisor is encouraged to conduct a systematic biannual survey of your laboratory safety by using the Self-audit Form. Every PI is required to provide a chemical inventory to OEHS annually.

1. Know your materials. Read SDS before start working with any chemical.
2. Minimize all chemical exposures.
3. Approach all chemicals as hazardous and use caution.
4. Use fume hoods and other ventilation devices properly to prevent exposure to airborne substances.
5. Follow safe practices and use Standard Operating Procedures (SOPs).
6. Clean up all spills and leaks promptly. Spill kits should be purchased and used to assist in clean-up operations.
7. Used needles and syringes, razor blades, Pasteur pipettes and other sharps should be placed in special "sharps" containers.
8. Appropriate warning signs should be posted near any dangerous equipment, reaction, or condition.
9. All equipment should be inspected for defects prior to use
10. Protect unattended operations from utility failures and other potential problems that could lead to overheating or other hazardous events.
11. Keep hallways, corridors and exit ways clear. Do not locate laboratory equipment or supplies in these areas.

**Basic Rules and Procedures for Working with Chemicals**

General Rules

The following should be used for essentially all laboratory work with chemicals:

1. Accidents and Spills--Eye Contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention

Ingestion: Encourage the victim to drink large amounts of water

Skin Contact: Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention. Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal.
Avoidance of "routine" exposure: Develop and encourage safe habits; avoid unnecessary exposure to chemicals by any route. Do not smell or taste chemicals. Vent apparatus, which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices. Inspect gloves and test glove boxes before use. Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres.

1. Use only those chemicals for which the quality of the available ventilation system is appropriate.
2. Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present; wash hands before conducting these activities. Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware or utensils that are also used for laboratory operations.
3. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.
4. Wash areas of exposed skin well before leaving the laboratory.
5. Horseplay: Avoid practical jokes or other behavior that might confuse, startle or distract another worker.
6. Do not use mouth suction for pipetting or starting a siphon.
7. Confine long hair and loose clothing. Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers.
8. Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.
9. Assure that all persons, including visitors, where chemicals are stored or handled, wear appropriate eye protection. Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, and replace them periodically. (A table of resistance to chemicals of common glove materials: hyper link to PPE).
10. Use protective and emergency apparel and equipment as appropriate. Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken. Remove laboratory coats immediately on significant contamination.
11. Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.
12. Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation.
13. Use of hood: Use the hood for operations that might result in release of toxic chemical vapors or dust. As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance. Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made; keep materials stored in hoods to a minimum and do not allow them to block vents or air flow. Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off".
14. Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal. Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the Hazardous Waste Management Plan( hyperlink). Do not discharge anything to the sewer.
15. Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous.
16. Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.
17. Prevention of spills and accidents: Be prepared for accidents and spills. Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity. Store breakable containers of these substances in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper. If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment.
18. Waste: Store contaminated waste in closed, suitably labeled,
19. Work with Chemicals of High Chronic Toxicity Examples: dimethylmercury and nickel carbonyl, benzo-a-pyrene , N-nitrosodiethylamine, other human carcinogens or substances with high carcinogenic potency in animals.
20. Access: Conduct all transfers and work with these substances in a "controlled area": a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions.
21. Approvals: Prepare a plan for use and disposal of these materials and obtain the approval of the laboratory supervisor.
22. Non-contamination/Decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood. Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the controlled area. Decontaminate the controlled area before normal work is resumed there .
23. Exiting: On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck.
24. Housekeeping: Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance was a dry powder.
25. Records: Keep accurate records of the amounts of these substances stored and used, the dates of use, and names of users
26. Signs and labels: Assure that the controlled area is conspicuously marked with warning and restricted access signs and that all containers of these substances are appropriately labeled with identity and warning labels
27. Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available.

Storage: Store containers of these chemicals only in a ventilated, limited access area in appropriately labeled, unbreakable, chemically resistant, secondary containers.

**Standard Laboratory Safety Practices**

<https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf>