



Carcinogens

Principal Investigator (PI) Approval is Required Prior to Performing this Procedure

Description

This standard operating procedure is designed to provide guidance in writing procedures for the safe handling and disposal of carcinogens, which are regarded as particularly hazardous substances. Review this document and supply the information required in order to make it specific to your laboratory.

A carcinogen is defined by meeting one the following:

- It is listed under the category, “known to be carcinogens” in the latest National Toxicology Program annual report.
- It is listed under Group 1 by the International Agency for Research on Cancer (IARC).
- It is listed in Group 2A or 2B by IARC or under the category, “reasonably anticipated to be carcinogens” by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³.
 - After repeated skin application of less than 300 mg/kg of body weight per week.
 - After oral dosages of less than 50 mg/kg of body weight per day.

If you have questions concerning the applicability of any item listed in this procedure contact the PI/Laboratory Supervisor for your department or Environment, Health and Safety (EHS) at (810) 766-6763.

Helpful Links

- [National Toxicology Program](#)
- [International Agency for Research on Cancer](#)
- [Occupational Safety and Health Administration \(OSHA\) 13 Carcinogens](#)

Potential Hazards

A carcinogen commonly describes any agent that can initiate or speed the development of malignant or potentially malignant tumors, malignant neoplastic proliferation of cells, or cells that possess such material.

Engineering Controls

- Manipulation of carcinogens outside of a fume hood may require special ventilation controls in order to minimize exposure to the material. Fume hoods provide the best protection against exposure to carcinogens in the laboratory and are the preferred ventilation control device. When possible, handle carcinogens in a fume hood. If the use of a fume hood proves impractical, attempt to work in a glove box or on an isolated area on the bench top away from others.
- Certain carcinogens must be handled in a glove box rather than a fume hood. Environment, Health and Safety (EHS) at (810) 766-6763, your department’s Laboratory Supervisor or the PI will determine if this is required.

- Where the eyes or body of any person may be exposed to carcinogens, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.
- Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of carcinogens which pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants, are acceptable.
- If available, consider using a Biological Safety Cabinet. The biological safety cabinet is designed to remove particulates (the carcinogen) before the air is discharged into the environment. Carcinogens that are volatile must not be used in a biological safety cabinet unless the cabinet is vented to the outdoors.
- If your research does not permit the handling of carcinogens in a fume hood, biological safety cabinet, or glove box, you must contact Environment, Health and Safety (EHS) at (810) 766-6763. If needed, UM Ann Arbor Occupational Safety and Environmental Health (OSEH) will also be consulted.
- Evacuated glassware can implode and eject flying glass, and splattered chemicals. Vacuum work involving carcinogens must be conducted in a fume hood, glove box or isolated in an acceptable manner.
- Mechanical vacuum pumps must be protected using cold traps and, where appropriate, filtered to prevent particulate release. The exhaust for the pumps must be vented into an exhaust hood.

Work Practice Controls

All areas where carcinogens are stored or manipulated must be labeled as a designated area.

- The room sign for the laboratory must contain a “Designated Area Within” identifier.
- All locations within the laboratory where carcinogens are handled should be demarcated with designated area caution tape (available from EHS, or your department) and/or posted with designated area caution signs. This includes all fume hoods and bench tops where the carcinogens are handled.
- All employees with access to designated areas must be made aware of the substances being used and necessary precautions by the PI.
- Where feasible, carcinogens should be manipulated over plastic-backed disposable paper work surfaces. These disposable work surfaces minimize work area contamination and simplify clean up.

Doorways: The room sign must contain a “Designated Area Within, Caution” where carcinogens, reproductive hazards, and/or acutely toxic chemicals are stored or used.

Containers: All containers of carcinogens must be clearly labeled with the correct chemical name. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Wash hands, forearms, face, and neck upon exit of a designated area to decontaminate.

Keep accurate records of amounts of carcinogenic substances being stored and used, including dates of use and names of researchers using the substances.

Personal Protective Equipment

Eye protection in the form of safety glasses, goggles, faces shields or appropriate combination must be worn at all times when handling carcinogens. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses cannot pass the rigorous test for industrial safety glasses.) Adequate safety glasses must meet the requirements of the Practice for Occupational and Educational Eye and Face Protection (ANSI Z.87.1) and must

be equipped with side shields. Safety glasses with side shields do not provide adequate protection from splashes; therefore, when the potential for splash hazard exists, other eye protection and/or face protection must be worn.

Gloves must be worn when handling carcinogens. Disposable nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should consult the glove manufacturer's chemical compatibility or chemical resistance charts or contact EHS for advice on chemical resistant glove selection when direct or prolonged contact with hazardous chemicals is anticipated.

Lab coats, closed toed shoes, and long sleeved clothing must be worn when handling carcinogens. Additional protective clothing should be worn if the possibility of skin contact is likely.

Any laboratory personnel considering the use of a respirator must contact Environment, Health and Safety (EHS) for a worksite assessment to determine if respirator use is necessary. Once a worksite assessment has been completed, and if it is determined that a respirator is necessary, EHS will implement the University's respirator program. This includes providing a medical examination, a respirator fit test, and training for laboratory personnel.

Waste Disposal

Because most spent, unused and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. ***Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers, unless authorized by UM Flint EHS.*** Contact Environment, Health and Safety (EHS) at (810) 766-6763 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also refer to UM-Flint Hazardous Waste Management Program and EHS webpage <http://www.umflint.edu/ehs/environment-health-and-safety> for more information.

Exposures/Unintended Contact



If the employee is in need of emergency medical attention, call 911 immediately.



For an actual chemical exposure/injury:

- Remove contaminated clothing. Flush exposed eyes or skin with water for at least 15 minutes. Seek medical attention (see below).
- For situations with risk of inhalation exposure (including spills of powder outside of a chemical fume hood), remove all persons from the contaminated area.
- If an ambulance is needed, call the University of Michigan - Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone to request assistance.

Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.

Report all work related accidents, injuries, illnesses or exposures to UM-Flint DPS. Additionally, employees and supervisors must be sure to report the injury to EHS and complete and submit the [Illness and Injury Report Form](#) to WorkConnections within 24 hours. Follow the directions on the WorkConnections website [Forms Instructions](#) to obtain proper medical treatment and follow-up.

If you were involved in or observed an incident or near miss, please complete the [EHS Laboratory Incident and Near-Miss Report Form](#). This will be valuable in improving laboratory safety on UM-Flint campus.

TREATMENT FACILITIES:

<u>MAJOR INJURIES</u>	<u>MINOR INJURIES –During Business Hours</u>	<u>MINOR INJURIES –After Business Hours</u>
Genesys Hospital One Genesys Parkway Grand Blanc, MI 48439 (810) 606-5710 Hurley Medical Center One Hurley Plaza Flint, MI 48503 (810) 262-9000 McLaren Hospital Flint 401 South Ballenger Hwy Flint, MI 48532 (810) 342-2000	Genesys Occupational Health Network 1460 Center Rd. Burton, MI 48509 (810) 715-4620 Mon. to Fri. 7:30 am to 10 pm Sat. & Sun. Noon to 8 pm McLaren Flint-Burton OCC Center 1459 S. Center Rd. Burton, MI 48509 (810) 496-0900 Mon. - Fri. 8 am to 8 pm Sat & Sun 10 am to 2 pm	Downtown Flint 420 S. Saginaw St. Flint, MI 48502 (810) 762-1550 Genesys East 1096 S. Belsay Rd, Suite F Burton, MI 48509 (810) 743-3351 Genesys North 4154 W. Vienna Rd Clio, MI 48420 (810) 686-7397 Genesys South 8447 N. Holly Rd Grand Blanc, MI 48439 (810) 603-0856 Mon. - Fri. 6 to 10pm / Sat. & Sun. 1-10pm

Click [here](#) for more information on the UM – Flint Emergency Preparedness and Response Plan.

Spill Procedures

- When a spill occurs, ***personal safety should always come first.***
- Alert and clear everyone in the immediate area where the spill occurred.

A **minor (small) chemical spill** is one of a known chemical that the laboratory staff is capable of handling safely without the assistance of safety and emergency personnel, i.e., less than 1 liter. A **major/large chemical spill** requires active assistance from emergency personnel.

Additional Spill Response Steps:

MINOR CHEMICAL SPILL

- Alert people in immediate area of spill.
- If spilled material is flammable, turn off ignition and heat sources. Don't light Bunsen burners or turn on other switches.
- Open outside windows, if possible.
- Wear protective equipment, including safety goggles, gloves and long-sleeve lab coat.
- Avoid breathing vapors from spill.
- Confine spill to as small an area as possible.
- **Do not wash spill down the drain.**
- Use appropriate spill kits/sorbents to neutralize corrosives and/or absorb spill. Collect contaminated materials and residues and place in container. For powdered chemicals sweep carefully to avoid generation of dust or, if appropriate, use moist sorbent pads or wet the powder with a suitable solvent and then wipe with a dry cloth. Contact EHS at (810) 766-6763 for proper disposal.
- Clean spill area with water.

MAJOR CHEMICAL SPILL

- Attend to injured or contaminated persons and remove them from exposure.
- Alert people in the laboratory to evacuate.
- If spilled material is flammable, turn off ignition and heat sources. Don't light Bunsen burners or turn on other switches.
- **Call University of Michigan – Flint Public Safety Department (DPS) at 911 immediately for assistance.**
- Close doors to affected area.
- Post warnings to keep people from entering the area.
- Have person available that has knowledge of incident and laboratory to assist emergency personnel.

Additional Spill Links:

- www.oseh.umich.edu/pdf/chemspil.pdf
- <http://www.oseh.umich.edu/emer-chemical.shtml>.

Report all emergencies, suspicious activity, injuries, spills, and fires to the UM-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone. Register with the [University of Michigan-Flint Emergency Alert System](#) via Wolverine Access. Also, preprogram the UM-Flint DPS telephone number (810) 762-3333 into your cell phone for quick, easy use.

Training of Personnel

All personnel are required to complete Laboratory Safety Training. Documentation of the training is required. This training can be accomplished by completing the **Comprehensive Laboratory Safety** session (BLS009 or equivalent) via [MyLINC](#), or UM-Flint EHS on-line training or other equivalent approved by EHS. Furthermore, all personnel shall read and fully adhere to this SOP when handling carcinogens.

Certification

I have read and understand the above SOP. I agree to contact my Supervisor or Lab Manager if I plan to modify this procedure.

Name	Signature	UM ID #	Date

Principal Investigator _____

Revision Date _____