



## Cytotoxins and Antineoplastic Drugs

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

### Description

*This standard operating procedure outlines the handling and use of cytotoxic chemicals and antineoplastic drugs. Review this document and supply the information required in order to make it specific to your facility. In accordance with this document, laboratories should use appropriate controls, protective equipment, and disposal techniques when handling cytotoxic chemicals and antineoplastic drugs.*

### Potential Hazards

Although little research has been done on the long-term risk of occupational exposure to cytotoxic drugs, these drugs have been associated with human cancers at high (therapeutic) levels of exposure. These drugs have been shown to be carcinogens, mutagens and teratogens in many animal species. There is evidence that hazardous drugs may cause spontaneous abortions and increase the risk of congenital malformations. In addition, some of these drugs have been shown to cause acute effects in humans, such as localized skin necrosis (death of tissue), damage to normal skin after surface contact, dizziness, lightheadedness.

Antineoplastic drugs are substances used as a cancer chemotherapeutic agent which affect the reproductive capabilities including chromosomal damage (mutagens), effects on the fetus (teratogens), and are carcinogenic in animal models. Most hazardous drugs either bind directly to genetic material in the cell nucleus or affect cellular protein synthesis. Cytotoxic drugs may not distinguish between normal and cancerous cells. The growth and reproduction of the normal cells are often affected during treatment of cancerous cells.

### Engineering Controls

All hazardous drug work will be conducted in a chemical fume hood or Class II Biological Safety Cabinet.

### Work Practice Controls

Decontamination should consist of surface cleaning with water and detergent followed by thorough rinsing. The use of detergent is recommended because there is no single accepted method of chemical deactivation for all agents involved. A plastic backed absorbent pad should be placed under the work area during the process. This should be changed at the end of each process or when a spill occurs.

All locations within the laboratory where cytotoxic or antineoplastic chemicals are handled should be demarcated with **designated area** caution tape and/or posted with designated area caution signs. This includes all fume hoods and bench tops where the antineoplastic drugs are handled.

### Personal Protective Equipment

Use doubled gloves with nitrile or neoprene gloves. Gloves should be changed frequently. Laboratory coat and safety glasses are required for preparation of material.

## Waste Disposal

All hazardous drug contaminated waste should be placed in a 5-gallon white pail. The container must be closed except when actively adding waste. The container must be located in the area where hazardous drugs are being used. All items contaminated by hazardous drugs, including gloves, syringes, vials, needles, and solution containers should be disposed according to Environment, Health and Safety (EHS) guidelines. Contact EHS at (810) 766-6763 for waste pick-up. Refer to UM-Flint Hazardous Waste Management Program and EHS webpage <http://www.umflint.edu/ehs/environment-health-and-safety> for more information.

Sharps – place needles, syringes with needles attached and other breakable items into appropriately labeled sharps containers.

Empty stock vials, reagent bottles, etc. – triple rinse with copious amounts of water. Deface label with black magic marker or scraper. Place in a cardboard box for disposal. Label the box as uncontaminated glass.

## Exposures/Unintended Contact



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



For an actual chemical exposure/injury:

- Flush exposed eyes or skin with water for at least 15 minutes, then seek medical attention (see below).
- Note: In case of inhalation, symptoms may be delayed up to 24 hours. Seek medical attention.
- If swallowed, ***obtain urgent medical attention.***

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:**

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

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

**Spill Procedure**

- 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 Gallon or 3.5 Liters. A **major/large chemical spill** requires active assistance from emergency personnel.

**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 UM-Flint DPS at 911 from any university telephone or (810) 762-3333 from any cell phone or non-university telephone 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/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 cytotoxins and antineoplastic drugs.

#### **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 \_\_\_\_\_