

Reproductive Hazards/Toxins

Standard Operating Procedure

Revision Date: 06/01/23

Laboratory Director (LD) and/or Principal Investigator (PI) Approval is Required Prior to Performing this Procedure

This standard operating procedure (SOP) outlines the handling and use of reproductive toxins. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling reproductive toxins.

Description [Provide additional information as it pertains to your research protocol]

A reproductive toxin is defined by OSHA as a substance or agent that may affect the reproductive health of women, men or the ability of couples to have healthy children (OSHA, n.d.). Reproductive toxicity can cause adverse effects to the reproductive organs and endocrine system. Developmental toxicity from reproductive hazards can occur during prenatal development or postnatal (Luderer et al, 2011).

Reproductive hazards are substances which affect reproductive capabilities including chromosomal damage and mutations (mutagens), epigenetic changes, malformations or anomalies of the fetus (teratogens), and death of the embryo at high doses. Reproductive hazards can cause infertility, defects in sperm and egg counts, impotence, birth defects, deformities, premature birth, miscarriage, and even death to the fetus or newborn (Rim, 2017).

The OSHA permissible exposure limit may not cover all compounds that are reproductive hazards and caution must be advised for all staff handling reproductive and developmental toxins.

Process [Write the steps for using the chemical in your research protocol]

Potential Hazards [Provide additional information as it pertains to your research protocol]

Exposure to toxicants can occur before and after conception. Pregnant women, women that plan to become pregnant, and those who are breastfeeding must be careful when handling reproductive materials to limit their exposure as much as possible. Men are also susceptible and should be cautious to limit exposure.

Reproductive hazards may include; but are not limited to biological agents (viruses and bacteria), physical agents (radiation) and chemical agents (mutagen and teratogens). Examples of these chemical agents and drugs that can be found in a research lab include anesthetic gases, contraceptive hormones, cytotoxic medications, antineoplastic drugs, endocrine disruptors, flammable and organic solvents,

heavy metals, and controlled substances. A safe dose threshold has not been determined for teratogens and certain factors can influence the rate of placental transfer. There are specific MIOSHA standards for 1,2-Dibromo-3 Chloropropane and ethylene oxide. For more information, please refer to the NIOSH List of Hazardous Substances for information on reproductive and antineoplastic drugs (CDC, 2016). An SDS (Safety Data Sheet) can also supply information on chemicals that are reproductive hazards.

For more information or questions regarding reproductive toxins or hazards contact EHS.

All woman that plan to become pregnant or become pregnant must notify their employer immediately if working with reproductive hazards. EHS Research, Health & Safety can provide an evaluation and risk assessment for staff working with reproductive hazards.

Engineering Controls [Provide additional information as it pertains to your research protocol]

All employees must be aware of the hazards they are working with. It is essential that all staff have the proper training on working safely with reproductive hazards and the risks of exposure.

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

The eyes or body of any person can be exposed to reproductive hazards, therefore 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.

When possible, handle reproductive hazards in a fume hood. Manipulation of reproductive hazards 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 reproductive hazards in the laboratory and are the preferred ventilation control device. If the use of a fume hood proves impractical, attempt to work in a glove box or Biological Safety Cabinet.

The Biological Safety Cabinet is designed to remove particulates (the reproductive hazard) before the air is discharged into the environment. Reproductive hazards that are volatile must not be used in a biological safety cabinet unless the cabinet is vented to the outdoors.

Certain reproductive hazards must be handled in a glove box rather than a fume hood. Environment, Health & Safety (EHS) at (810) 766-6763 or the Laboratory Director will determine if this is required.

If your research does not permit the handling of reproductive hazards in a fume hood, biological safety cabinet, or glove box, you must contact EHS for a risk assessment.

Evacuated glassware can implode and eject flying glass, and splattered chemicals. Vacuum work involving reproductive hazards 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 [Provide additional information as it pertains to your research protocol]

Doorways: The laboratory must contain a *Designated Area* label or sign for areas where carcinogens, reproductive hazards, and/or highly toxic chemicals are stored or used. Labels or signs may go on the door sign or by the area where the chemicals are stored or used. See the Highly Toxic Chemicals SOP for more information.

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

When feasible, reproductive hazards should be manipulated over plastic-backed disposable paper work surfaces. These disposable work surfaces minimize work area contamination and simplify clean up.

Protective Equipment [Provide additional information as it pertains to your research protocol]

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

Double gloves should be worn when handling reproductive hazards. Disposable nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should contact EHS for advice on chemical resistant glove selection when direct or prolonged contact with hazardous chemicals is anticipated.

Eye protection in the form of safety glasses must be worn at all times when handling reproductive hazards. 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 ANSI Z87.1 and must be equipped with side shields. Safety glasses with side shields do not provide adequate protection from splashes; therefore, when the potential for a splash hazard exists, other eye protection and/or face protection must be worn.

Transportation and Storage [Provide additional information as it pertains to your research protocol]

Reproductive hazards must be stored in a designated area.

Waste Disposal [Provide additional information as it pertains to your research protocol]

All materials contaminated with reproductive hazards should be disposed of as a hazardous waste. 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**

Environment, Health & Safety (EHS). Contact EHS at (810) 766-6763 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also refer to the UM-Flint EHS [Hazcom & Regulated Waste](#) web page and the U-M EHS [Hazardous Waste](#) Web page for more information.

Training of Personnel

All personnel are required to complete the **General Laboratory Safety Training** session (**BLS025w or equivalent**) via the [EHS My LINC](#) Web page. Furthermore, all personnel shall read and fully adhere to this SOP when handling reproductive toxins.

Suggested Signage

The sign below may be printed for use in the laboratory to label designated use or storage areas. Resize images as needed for printing.



References:

Center for Disease Control. (2016). NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings, 2016. Retrieved from

<https://www.cdc.gov/niosh/docs/2016-161/pdfs/2016-161.pdf?id=10.26616/NIOSH PUB2016161>

Luderer, U., Hieb, M., Diaz, J., Baker, B. (2011). Reproductive and Developmental Hazard Management Guidance: ACOEM Task Force on Reproductive Toxicology. *Journal of Occupational and Environmental Medicine*, 53(8). <http://doi.org/10.1097/JOM.0b013e318229a549>

OSHA. (n.d.). Reproductive Hazards. Retrieved from

<https://www.osha.gov/SLTC/reproductivehazards/hazards.html>

Rim, K. (2017). Reproductive Toxic Chemicals at Work and Efforts to Protect Workers' Health: A Literature Review. *Safety and Health at Work*, 8(2). <https://doi.org/10.1016/j.shaw.2017.04.003>

Certification

I have read and understand the above SOP. I have received approval from my Lab Director (LD)/Principal Investigator (PI) to perform this procedure. I agree to contact my LD/PI if I plan to modify this procedure.

Name	Signature	UMID #	Date

Laboratory Director/Principal Investigator

Revision Date

Major Revisions (Tracking purposes only -- Do not print as part of SOP)

Date	Revision
03-22-18	Put into EHS format, changed department name, and fixed links. Revised Spill Procedure section (AJK).
04-23-18	Changed injury type and action from paragraph to table format (AJK).
02-28-19	Updated links and formatting (DML).
05-18-20	Updated editing rights to headings (RSH)
06-01-23	Adapted for UM-Flint