

EXPOSURE CONTROL FOR CHEMICAL REPRODUCTIVE HAZARDS

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

The purpose of this SOP is to provide an overview of chemical reproductive hazards and control techniques to prevent adverse effects resulting from occupational exposure. Reproductive hazards may be described as mutagens or teratogens.

- Mutagens are defined as agents that cause alterations in genetic material.
- Teratogens are defined as agents that alter the organ formation, or cause birth defects or congenital malformations.

Examples of Chemical Reproductive Hazards

Examples of chemicals classified as reproductive hazards include: acrylonitrile, benzene, chloroform, dimethyl formamide, ethidium bromide, mercury, methylene chloride, and zinc chloride. Material Safety Data Sheets (MSDSs) provide information regarding reproductive hazards of chemicals. Additional information regarding chemical as well as other reproductive hazards (e.g., viruses, bacteria, ionizing radiation, etc.) is available from the Agency for Toxic Substances Disease Registry (ATSDR) at <http://www.atsdr.cdc.gov>; and the National Institute for Occupational Safety and Health (NIOSH) at <http://www.cdc.gov/niosh/topics/repro/>. It is important to note that many chemicals have not been thoroughly evaluated to determine if they pose a reproductive hazard.

Routes and Timing of Exposure

As with any chemical, workplace exposures to chemical reproductive hazards may occur by inhalation, ingestion, absorption, penetration, or injection. Reproductive hazards can affect both men and women and may cause effects before and after conception.

- **Before conception.**
Some agents and activities disrupt normal hormonal balances in both men and women. In women, an imbalance may disrupt normal menstrual cycles, reduce fertility, or induce early menopausal symptoms. In men, hormonal imbalances may cause impotence, and reduced sperm counts. In addition, exposures to mutagens may damage sperm causing miscarriage or birth defects.
- **Conception and growth**
Some reproductive hazards hinder the development of the placenta, while others can cross the placenta to directly affect the fetus. Both situations may result in miscarriage or cause physical malformations. During pregnancy, exposure to mutagens may cause miscarriage, growth abnormalities, birth defects, or childhood cancer. A developing fetus is most vulnerable to teratogens during the

first 14 to 60 days of development. This is problematic because many women may not know they are pregnant during this time.

Exposure Control Programs for Reproductive Hazards

To minimize chemical exposures, UNL has implemented a Chemical Safety Program, which is based in OSHA's Hazard Communication and Laboratory standards. UNL's Chemical Safety program minimizes chemical exposure through the use of engineering controls, such as exhaust hoods; administrative controls such as safe work practices and training; and appropriate personal protective equipment (PPE). Following are recommendations related to chemical reproductive hazards, which are in addition to the guidance and instruction provided through general chemical safety SOPs (such as but not limited to **General Guidance for Chemical Ordering, Receipt, Distribution, Use & Storage**, the EHS Virtual Manual, and EHS Chemical Safety training.

- If pregnant or planning to conceive, consult with your supervisor and physician regarding working with known teratogens or mutagens.
- Adhere to all applicable recommendations related to effective controls (administrative, engineering, and/or PPE).
- Restrict use of reproductive toxins and other highly toxic chemicals to designated work areas and ensure that all persons who frequent the area or work with such chemicals are aware of the location and hazards. If in dust or volatile form, restrict use to a properly functioning chemical fume hood. For extremely toxic materials, use may be restricted to a glove box. Special requirements will be necessary when work involves administering of reproductive toxins to animals, and should be detailed in the research protocol.
- Clean designated work locations upon known contamination and at the end of the work day. It may be advisable to cover work benches with absorbent paper to facilitate cleaning. Clean equipment in accordance with manufacturer's recommendations. Use wet-cleaning methods. Do not sweep spilled materials.
- Seek medical consultation for exposures that likely approach or exceed any established occupational limits or result in signs or symptoms of exposure. See EHS SOP, **On-The-Job Injuries**.
- To the extent feasible, minimize the amount of material handled and stored. Consult EHS for an industrial hygiene/exposure assessment if handling toxicologically significant quantities at any given time. In some cases, medical surveillance may be recommended.
- Avoid glass to minimize the potential for breakage.
- Containerize grossly contaminated disposable items and waste solutions/chemicals for pickup by EHS.