

1. PURPOSE

This Standard Operating Procedure (SOP) describes the guidelines for the use of chemical hazards in rodents. Where an SOP exists for specific chemical hazards, that SOP must be followed.

2. CONSIDERATIONS

Hazardous chemicals and drugs are characterized as carcinogens, cytotoxins, anti-neoplastics, reproductive toxins, mutagens, and teratogens. This SOP aims to ensure that the potential of exposure is reduced as much as possible and that these agents pose no risk to research staff, animal care personnel, and other personnel working in the animal facility.

To minimize the risk of exposure, the Principal Investigator and/or delegate(s) must identify all points of hazard and put in place safe work practices for all steps involving contact with chemical hazards, as per procedures presented in this SOP and in consultation with the McGill Environmental Health and Safety (EHS) officer.

All chemical hazards must be listed in an approved Animal Use Protocol (AUP).

3. RESPONSIBILITY

Principal investigator (PI) and their research staff, animal care staff, veterinarian, veterinary care staff.

4. MATERIALS

- 4.1. Personal protective equipment (PPE):
 - 4.1.1. Two pairs of nitrile gloves or compatible chemical-resistant gloves
 - 4.1.2. Gown, disposable gown, or lab coat
 - 4.1.3. Disposable sleeve covers
 - 4.1.4. Procedure mask or fit-tested N95 respirator
 - 4.1.5. Safety glasses, goggles, or faceshield
- 4.2. Chemical fume hood, Type II B1 or Type II B2 Biological Safety Cabinet, Cage Transfer Station
- 4.3. Absorbent pads
- 4.4. Detergent solution
- 4.5. 70% alcohol
- 4.6. Disinfectant solution (e.g., accelerated hydrogen peroxide, bleach)
- 4.7. Compressed cotton fiber bedding pads (iso-PADS® Enrichment Bedding)
- 4.8. Waste disposal bags and containers

5. GENERAL PRECAUTIONS

- 5.1. Use of chemical hazards must be described in the Facility Animal Care Committee (FACC) approved Animal Use Protocol (AUP).
- 5.2. In collaboration with the animal facility staff, PI and/or delegate who will be working with chemical hazards must develop and implement written SOPs that minimize exposure, e.g., a method of preparation, handling, and disposal.
- 5.3. Safety Data Sheet (SDS) for the chemical hazards should be readily available, e.g., in McGill's [myLab](#) catalog, and research staff and animal facility staff should be familiar with the SDS.
- 5.4. Pregnant or breast-feeding women should refer to the University Laboratory Safety Committee's (ULSC) Policy on Reproductive Health in the Laboratory prior to working with chemical hazards.

- 5.5. Storage precautions and transportation:
 - 5.5.1. All containers of hazardous chemicals/drugs must be clearly labeled, e.g., cytotoxic, and adequately stored when not in use.
 - 5.5.2. Keep containers tightly closed, preferably in a locked cabinet. Keep container in a cool, well-ventilated area away from sources of ignition. Refer to SDS for specific storage conditions.
 - 5.5.3. Storage and transport containers should be unbreakable, rigid, shock-resistant, leak-proof and made of a non-reactive material which can be easily cleaned and decontaminated in the event of a leak.
 - 5.5.4. Transport chemical hazard containers in a closed, leak-proof plastic bag, e.g., zip-lock bag.
 - 5.5.5. Dispose of empty containers by incineration through the Waste Management department.
- 5.6. Personal protective equipment (PPE) must be worn at all times when handling chemical hazards, in addition to any PPE requirements of the animal room. Wash hands after removing PPE.
- 5.7. Needles and sharps used with chemical hazards must be disposed of immediately in a sharps container. Do not bend or recap needles. Safety needles should be used whenever possible.
- 5.8. Thoroughly wash hands after handling or administering chemical hazards.
- 5.9. Clearly indicate the chemical hazard on the animal housing room door.
- 5.10. All cages housing animals that have been treated with chemical hazards must be clearly labeled with the following information:
 - 5.10.1. Name of agent
 - 5.10.2. Date(s) of administration
 - 5.10.3. Contact name
 - 5.10.4. The recovery date or the date cages are no longer considered hazardous, e.g., 7 days after the last administration.

6. PROCEDURES

- 6.1. The following personal protective equipment must be worn at all times when handling chemical hazards (in addition to the personal protective requirements of the animal room):
 - 6.1.1. 2 pairs of nitrile gloves or other appropriate chemical-resistant glove as per the SDS
 - 6.1.2. Gown or lab coat
 - 6.1.3. Disposable sleeve covers
 - 6.1.4. Procedure mask or N95 respirator
 - 6.1.5. Eye protection when there is risk of being splashed
- 6.2. All waste, e.g., PPE, absorbent pads, bedding, should be discarded as hazardous materials in a biohazard box for incineration.
- 6.3. Work areas should be protected from spills by placing an absorbent pad with an impervious backing (absorbent material facing up). The absorbent pad is disposed of as a hazardous material.
- 6.4. Areas where chemical hazards are prepared and/or administered must be cleaned and decontaminated immediately following each procedure. Use a detergent solution followed by a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.
- 6.5. Preparation of chemical hazards solutions:
 - 6.5.1. Solutions containing chemical hazards should be prepared in the laboratory, outside of the animal facility.
 - 6.5.2. Any handling, including weighing of powder, preparation of dilutions, and any procedure with the potential of producing aerosols, must be conducted in a certified chemical fume hood or in a Class II Type B2 Biological Safety Cabinet (BSC).
 - 6.5.3. Work areas should be protected from spills by placing an absorbent pad with an impervious backing (absorbent material facing up).

- 6.5.4. Areas where chemical hazards are prepared or handled must be cleaned and decontaminated immediately following each procedure. Use a detergent solution followed by a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.
- 6.6. Animal Handling and Husbandry:
 - 6.6.1. House rodents in microisolator cages with filter top lids.
 - 6.6.2. All animal handling, chemical hazard administration, and cage manipulations must be conducted in a certified chemical fume hood or in a Class II Type B1 or B2 BSC until animals and cages are no longer considered hazardous.
 - 6.6.3. When using a Type II B1 BSC for chemical hazard administration, only pre-filled syringes must be used, i.e., syringes filled in a chemical fume hood or Type II B2 BSC.
 - 6.6.4. Consider using compressed cotton fiber bedding pads (iso-PADS®) instead of standard bedding when chemical hazards or metabolites are mainly excreted in the urine. The pads are more absorbent than traditional bedding and will minimize the creation of aerosols.
 - 6.6.5. Work areas should be protected from spills by placing an absorbent pad with an impervious backing (absorbent material facing up).
 - 6.6.6. Clean and decontaminate area after handling or administration using a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.
 - 6.6.7. . The absorbent pad is disposed of as a hazardous material.
 - 6.6.8. Follow these procedures until cage bedding is no longer considered contaminated. Cages must be clearly labelled with all the administration date(s). During this period, change cages in the following manner:
 - 6.6.8.1. Protect work area by placing an absorbent pad with an impervious backing, absorbent material facing up.
 - 6.6.8.2. Place a waste bag inside the chemical fume hood or BSC.
 - 6.6.8.3. Place a clean, empty cage with lid inside the chemical fume hood or BSC.
 - 6.6.8.4. Bring the cages to the chemical fume hood or BSC. Transfer animals to the clean empty cage. Discard soiled bedding or bedding pad in the waste bag.
 - 6.6.8.5. Spray the cage with 70% alcohol solution and wipe clean. Alternatively, a chemical known to deactivate the chemical hazard, e.g., bleach, acetic acid, can be used in place of alcohol but it rinse with water before housing animals. Place used paper towels in the waste bag.
 - 6.6.8.6. Place clean autoclaved bedding or bedding pads in the cleaned cages (cages are not sent to cage wash). Return animals to the cage. Replenish food and water as needed.
 - 6.6.8.7. When finished, clean transfer cage by spraying the cage with 70% alcohol solution and wipe clean. Place a lid to cover the cage and bring to cage wash area for processing as described in section 6.7.
 - 6.6.8.8. Roll absorbent pad with the absorbent material towards the inside and place in the waste bag. Discard the outer pair of gloves and close the waste bag.
 - 6.6.8.9. Place the waste bag in the biohazard box. When the box is full, tape closed, document the type of waste on the box and send to incineration (not autoclaving).
 - 6.6.8.10. Repeat previous steps until the bedding is no longer considered contaminated.
 - 6.6.9. When cage bedding is no longer considered contaminated, change cages in the following manner:
 - 6.6.9.1. Follow steps 6.6.8.1. to 6.6.8.5 but transfer animals to a clean cage with standard bedding. Change the grill, food, water bottle or valve, and filter top lid.
 - 6.6.9.2. Return animals to standard housing conditions. Remove any cage labels but leave name of chemical hazard and administration date(s).
 - 6.6.9.3. Stack the soiled cages and transport to the cage wash area covered with filter top lids.
- 6.7. Cage washing:
 - 6.7.1. Do not autoclave soiled cages before processing.
 - 6.7.2. Wearing the following PPE when processing soiled cages:
 - 6.7.2.1. Designated lab coat or gown

- 6.7.2.2. Nitrile gloves
- 6.7.2.3. N95 respirator
- 6.7.2.4. Face shield or goggles
- 6.7.3. Wash cages in an automated washer.
- 6.7.4. As an alternative, disposable cages can be used and discarded in their entirety.
- 6.8. Waste disposal:
 - 6.8.1. All items contaminated or potentially contaminated with the chemical hazard (e.g., needles, gloves, bedding, paper towels) must be discarded in waste bags and placed in a biohazard box and incinerated.
 - 6.8.2. Dead animals must be double-bagged before disposal.
 - 6.8.3. McGill's Waste Management department will collect waste for incineration.

7. SAFETY

- 7.1. In case of accidental exposure:
 - 7.1.1. Potential routes of exposures include: inhalation, eye contact, skin absorption, ingestion and unintentional injection.
 - 7.1.2. Report the incident immediately to your supervisor. A McGill University [Accident & Incident Report form](#) must be completed within 24 hours.
 - 7.1.3. Splash in eyes:
 - 7.1.3.1. Flush eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center.
 - 7.1.3.2. If required, transport the victim after flushing eyes to a hospital.
 - 7.1.4. Skin exposure:
 - 7.1.4.1. Immediately flush affected skin with water while removing and isolating all contaminated clothing.
 - 7.1.4.2. Gently wash all affected skin areas thoroughly with soap and water.
 - 7.1.4.3. If symptoms such as redness or irritation develop, or if indicated in the SDS, seek medical attention.
 - 7.1.5. Inhalation:
 - 7.1.5.1. Immediately leave the contaminated area; take deep breaths of fresh air.
 - 7.1.5.2. Immediately call a physician or poison control center.
 - 7.1.6. Ingestion:
 - 7.1.6.1. Do not induce vomiting. Volatile chemicals have a high risk of being aspirated into the lungs during vomiting which increases the medical problems.
 - 7.1.6.2. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and immediately call a hospital or poison control center.
 - 7.1.6.3. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. Immediately seek emergency medical care.
- 7.2. Small spills and leakage:
 - 7.2.1. Use absorbent paper to pick up all liquid spill material. Place absorbent paper in a waste bag and dispose in biohazard box for incineration.
 - 7.2.2. Wash any surfaces you may have contaminated. Use a detergent solution followed by a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.

SOP REVISION HISTORY

DATE	NEW VERSION
2023.09.08	1. PURPOSE This Standard Operating Procedure (SOP) describes the guidelines for the use of hazardous agents chemical hazards in rodents. Where an SOP exists for specific chemical hazards, that SOP must be followed.
2023.09.08	3. RESPONSIBILITY Principal investigator (PI) and their research staff, animal care staff, veterinarian , veterinary care staff.
2023.09.08	4.1. Personal protective equipment (PPE): 4.1.1. Two pairs of nitrile gloves or compatible chemical-resistant gloves 4.1.2. Gown, disposable gown, or lab coat 4.1.3. Disposable sleeve covers 4.1.4. Procedure mask or fit-tested N95 respirator 4.1.5. Safety glasses, goggles, or faceshield
2023.09.08	4.4. Detergent solution 4.5. 70% alcohol
2023.09.08	5.3. Safety Data Sheet (SDS) for the chemical hazards should be readily available, e.g., in McGill's myLab catalog, and research staff and animal facility staff should be familiar with the SDS.
2023.09.08	5.4. Pregnant or breast-feeding women should not work with hazardous agents refer to the University Laboratory Safety Committee's (ULSC) Policy on Reproductive Health in the Laboratory prior to working with chemical hazards.
2023.09.08	5.5.2. Keep containers tightly closed, preferably in a locked cabinet. Keep container in a cool, well-ventilated area away from sources of ignition. Refer to SDS for specific storage conditions. 5.5.3. Hazardous chemical/drugs must be transported in Storage and transport containers should be unbreakable containers, rigid, shock-resistant, leak-proof and made of a non-reactive material which can be easily cleaned and decontaminated in the event of a leak. 5.5.4. Transport chemical hazard containers in a closed, leak-proof plastic bag, e.g., zip-lock bag. 5.5.5. Dispose of empty containers by incineration through the Waste Management department.
2023.09.08	5.6. Personal protective equipment (PPE) must be worn at all times when handling chemical hazards, in addition to any PPE requirements of the animal room. Wash hands after removing PPE.
2023.09.08	5.7. Needles and sharps used with chemical hazards must be disposed of immediately in a sharps container. Do not bend or recap needles. Safety needles should be used whenever possible.
2023.09.08	5.9. Research staff must inform the animal facility at least 72 hours before administering chemical hazards to animals. This will ensure adequate preparation and availability of necessary equipment provided by the animal facility (e.g., disposal containers, PPE, bedding pads).
2023.09.08	5.10.3. Contact name 5.10.4. The recovery date or the date cages are no longer considered hazardous, e.g., 7 days after the last administration.
2023.09.08	6.1.2. Disposable Gown or lab coat 6.1.3. Disposable sleeve covers 6.1.4. Procedure mask or N95 respirator 6.1.5. Safety glasses or goggles Eye protection when there is risk of being splashed
2023.09.08	6.4. Areas where chemical hazards are prepared and/or administered must be cleaned and decontaminated immediately following each procedure. Use a detergent solution followed by a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.
2023.09.08	6.5. Preparation of chemical hazards solutions: 6.5.1. Solutions containing chemical hazards should be prepared in the laboratory, outside of the animal facility.
2023.09.08	6.6.1. House rodents in microisolator cages with filter top lids.
2023.09.08	6.6.3. When using a Type II B1 BSC for chemical hazard administration, only pre-filled syringes must be used, i.e., syringes filled in a chemical fume hood or Type II B2 BSC.
2023.09.08	6.6.4. Consider using compressed cotton fiber bedding pads (iso-PADS [®]) instead of standard bedding when chemical hazards or metabolites are mainly excreted in the urine. The pads are very more absorbent than traditional bedding and will minimize the creation of aerosols and are easier to dispose of.
2023.09.08	6.6.6. Clean and decontaminate area after handling or administration using a 70% alcohol solution. The absorbent pad is disposed of as a hazardous material.
2023.09.08	5.4.6. Animal cages should not be changed for a minimum of three days after the date of hazardous agent administration. 6.6.7. Cage bedding is considered contaminated until at least 7 days after the hazardous agent is no longer administered and must be disposed of Follow these procedures until cage bedding is no longer considered contaminated. Cages must be clearly labelled with all the administration date(s). During this period, change cages in the following manner:
2023.09.08	5.4.7.1. Handle all cages in a certified chemical fume hood or Type II B2-BSC. 5.4.7.2. Place the dirty bedding or bedding pad in a biohazard bag inside the chemical fume hood or BSC. Close the biohazard bag and place it in a second biohazard bag. 5.4.7.3. Rinse the cage with disinfectant solution and paper towels inside the chemical fume hood or BSC. 5.4.7.4. Place used paper towels in a biohazard bag inside the chemical fume hood or BSC. 5.4.7.8. Then wash the dirty cages by hand as in step 5.3.7.3, stack them in a biohazard bag and bring to cage wash area. 5.4.7.9. Wearing mask, gown and gloves, open the bags and place the cages in the cage washer to be washed (no need to autoclave first) 6.6.7.1. Protect work area by placing an absorbent pad with an impervious backing, absorbent material facing up. 6.6.7.2. Place a waste bag inside the chemical fume hood or BSC. 6.6.7.3. Place a clean, empty cage with lid inside the chemical fume hood or BSC. 6.6.7.4. Bring the cages to the chemical fume hood or BSC. Transfer animals to the clean empty cage. Discard soiled bedding or bedding pad in the waste bag. 6.6.7.5. Spray the cage with 70% alcohol solution and wipe clean. Alternatively, a chemical known to deactivate the chemical hazard, e.g., bleach, acetic acid, can be used in place of alcohol but it rinse with water before housing animals. Place used paper towels in the waste bag. 6.6.7.6. Place clean autoclaved bedding or bedding pads in the cleaned cages (cages are not sent to cage wash). Return animals to the cage. Replenish food and water as needed. 6.6.7.7. When finished, clean transfer cage by spraying the cage with 70% alcohol solution and wipe clean. Place a lid to cover the cage and bring to cage wash area for processing as described in section 7.6. 6.6.7.8. Roll absorbent pad with the absorbent material towards the inside and place in the waste bag. Discard the outer pair of gloves and close the waste bag.
2023.09.08	6.6.8. When cage bedding is no longer considered contaminated, change cages in the following manner: 6.6.8.1. Follow steps 6.6.7.1. to 6.6.7.5 but transfer animals to a clean cage with standard bedding. Change the grill, food, water bottle or valve, and filter top lid. 6.6.8.2. Return animals to standard housing conditions. Remove any cage labels but leave name of chemical hazard and administration date(s). 6.6.8.3. Stack the soiled cages and transport to the cage wash area covered with filter top lids.

2023.09.08	<p>6.7. Cage washing:</p> <p>6.7.1. Do not autoclave soiled cages before processing.</p> <p>6.7.2. Wearing the following PPE when processing soiled cages:</p> <p>6.7.2.1. Designated lab coat or gown</p> <p>6.7.2.2. Nitrile gloves</p> <p>6.7.2.3. N95 respirator</p> <p>6.7.2.4. Face shield or goggles</p> <p>6.7.3. Wash cages in an automated washer.</p> <p>6.7.4. As an alternative, disposable cages can be used and discarded in their entirety.</p>
2023.09.08	<p>7.2.2. Wash any surfaces you may have contaminated. Use a detergent solution followed by a 70% alcohol solution, or a chemical known to inactivate the chemical hazard, e.g., bleach, acetic acid, as described in the SDS.</p>