McGill

STANDARD OPERATING PROCEDURE #715

USE OF CISPLATIN IN RODENTS

1. PURPOSE

This Standard Operating Procedure (SOP) describes the guidelines for the use of cisplatin in rodents.

2. CONSIDERATIONS

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

Cisplatin is a platinum-based chemotherapy drug, an antineoplastic agent. It is cytotoxic, nephrotoxic, and neurotoxic. Cisplatin may be harmful if inhaled, ingested, or absorbed through the skin. It causes irritation to the respiratory tract, gastrointestinal tract, skin, and eyes.

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 cisplatin, as per procedures presented in this SOP and in consultation with the McGill Environmental Health and Safety (EHS) Officer.

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
- 4.1.2. Gown or lab coat
- 4.1.3. Sleeve covers
- 4.1.4. Procedure mask
- 4.1.5. Fit-tested N95 respirator (for cage processing)

4.2. Chemical fume hood, Class II Type B1 or Class II Type B2 Biological Safety Cabinet (BSC)

4.3. Absorbent pads

4.4. 0.5% accelerated hydrogen peroxide solution

4.5. Compressed cotton fiber bedding pads (iso-PADS® Enrichment Bedding)

4.6. Shock-resistant secondary container for transport of cisplatin

4.7. CSA-approved sharps disposal container

4.8. Waste disposal bags and boxes

5. GENERAL PRECAUTIONS

5.1. Use of cisplatin must be described in the Facility Animal Care Committee (FACC) approved Animal Use Protocol (AUP).

5.2. 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.

5.3. Women who are pregnant, expecting to become pregnant, or nursing should not handle or be exposed to cisplatin or feces/urine of animals treated with cisplatin. Refer to the University Laboratory Safety Committee's (ULSC) Policy on Reproductive Health in the Laboratory.

5.4. Cisplatin is eliminated predominantly via the kidney. While elimination of cisplatin from the blood is very rapid (mostly within 1 hour), elimination from the tissues is a longer process and, consequently, the procedures in this SOP must be followed when handling animals and bedding for 3 days after the final cisplatin administration. Carcasses should be considered contaminated for the duration of the experiment.

5.5. Storage precautions and transportation:

5.5.1. All containers of cisplatin must be clearly labeled and adequately stored when not in use. Protect from moisture, incompatible materials, and sources of ignition.

5.5.2. 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.

5.5.3. Cisplatin is light sensitive and should be made and stored in a light-blocking vessel (amber, or foil wrapped).

5.5.4. 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 cisplatin, in addition to any PPE requirements of the animal room. Wash hands after removing PPE.

5.7. Needles and sharps used with cisplatin must be disposed of immediately in a sharp container. Do not bend or recap needles. Safety needles should be used whenever possible.

5.8. Thoroughly wash hands after handling or administering cisplatin.

5.9. Use 0.5% accelerated hydrogen peroxide solution (Peroxigard, Prevail) for decontamination of equipment and areas exposed to cisplatin.

5.10. All cages housing animals that have been treated with Cisplatin must be clearly labeled with the following information:

5.10.1. Name of agent: cisplatin

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, i.e., 3 days after the last administration.

6. PROCEDURES

6.1. Preparation of cisplatin solutions:

6.1.1. Any handling, including weighing of powder, preparation of dilutions, filling syringes, 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** BSC.

6.1.2. Work areas should be protected from spills by placing an absorbent pad with an impervious backing (absorbent material facing up).

6.1.3. Areas where cisplatin is prepared or handled must be cleaned and decontaminated immediately following each procedure using accelerated hydrogen peroxide solution.

6.2. Animal Handling:

6.2.1. Make sure that animals are adequately restrained at the time of injection.

6.3. Animal Husbandry:

6.3.1. House rodents in microisolator cages with filter top lids.

6.3.2. It is strongly recommended to use compressed cotton fiber bedding pads (iso-PADS®) instead of standard bedding to minimize the creation of aerosols.

6.3.3. All animal handling, cisplatin administration, and cage manipulations must be conducted in a chemical fume hood, Type II B1 BSC, or Type II B2 BSC for at least 3 days after the final administration.

6.3.4. When using a Type II B1 BSC, note that only pre-filled syringes must be used, i.e., syringes filled in a chemical fume hood or Type II B2 BSC.

6.3.5. Work areas should be protected from spills by placing an absorbent pad with an impervious backing (absorbent material facing up).

6.3.6. Clean and decontaminate area after handling or administration using accelerated hydrogen peroxide solution. The absorbent pad is disposed of as a hazardous material.

6.3.7. Cage bedding is considered contaminated at least 3 days after the last cisplatin administration. Cages must be clearly labelled with all the administration date(s). During this period, change cages in the following manner:

6.3.7.1. Protect work area by placing an absorbent pad with an impervious backing, absorbent material facing up.

6.3.7.2. Place a waste bag inside the chemical fume hood or BSC.

6.3.7.3. Place a clean, empty cage with lid inside the chemical fume hood or BSC.

6.3.7.4. 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.

6.3.7.5. Spray the cage with accelerated hydrogen peroxide solution and wipe clean. Place used paper towels in the waste bag.

6.3.7.6. 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.

6.3.7.7. When finished, clean the transfer cage by spraying the cage with accelerated hydrogen peroxide solution and wipe clean. Place a lid to cover the cage and bring it to cage wash area for processing as described in section 6.3.9.

6.3.7.8. 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.

6.3.7.9. 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).

6.3.8. When cage bedding is no longer considered contaminated (3 days after the last cisplatin administration), change cages in the following manner:

6.3.8.1. Follow steps 6.3.7.1. to 6.3.7.5 but transfer animals to a clean cage with standard bedding. Change the grill, food, water bottle or valve, and filter top lid.

6.3.8.2. Return animals to standard housing conditions. Remove any cage labels but leave the name of chemical hazard and administration date(s).

6.3.8.3. Stack the empty cages and transport them to the cage wash area covered with filter top lids.

6.3.9. Cage washing:

6.3.9.1. Do not autoclave used cages before processing.

6.3.9.2. Wearing the following PPE when processing soiled cages:

6.3.9.2.1. Designated lab coat or gown

6.3.9.2.2. Gloves and sleeves

6.3.9.2.3. N95 respirator

6.3.9.2.4. Face shield or goggles

6.3.9.3. Empty soiled bedding in a certified, ventilated and filtered bedding disposal unit. Wash cages as usual.

6.3.9.4. Wash cages with an automated washer.

6.4. Small spills and leakage:

6.4.1. Use absorbent paper to pick up all liquid spill material.

6.4.2. Wash any surfaces you may have contaminated with accelerated hydrogen peroxide solution.

6.5. Waste disposal:

6.5.1. All items contaminated or potentially contaminated with cisplatin, e.g., gloves, bedding, paper towels, are discarded as hazardous waste by incineration.

7. SAFETY

7.1. In case of accidental exposure:

7.1.1. Potential routes of exposures include inhalation, skin absorption, ingestion, and unintentional injection.

7.1.2. Report the incident immediately to your supervisor. A McGill University Accident, Incident & Occupational Disease Report form must be completed.

7.1.3. Splash in eyes:

7.1.3.1. Flush eyes with water or normal saline solution for 15 minutes. Remove contact lenses.

7.1.3.2. Seek medical attention after flushing eyes.

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. Rinse for 15 minutes

7.1.4.3. If symptoms such as redness or irritation develop, 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.

7.1.6.2. Give 1 or 2 glasses of water and immediately call a hospital or poison control center.

8. REFERENCES

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8.4. Johnsson, A., Olsson, C., Nygren, O., Nilsson, M., Seiving, B., & Cavallin-Stahl, E. (1995). Pharmacokinetics and tissue distribution of cisplatin in nude mice: platinum levels and cisplatin-DNA adducts. Cancer chemotherapy and pharmacology, 37(1-2), 23–31. https://doi.org/10.1007/BF00685625

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CISPLATIN

Open only Type II B1 or B2 BSC

DATES OF ADMINISTRATION		RECOVERY DATE
1.	5.	
2.	6.	CONTACT
3.	7.	
4.	8.	