
1. PURPOSE

This document describes the guidelines for the use of streptozotocin (STZ) in animal research.

2. SCOPE

This guideline applies to all research personnel or others at Western University and affiliated institutions that are working with, or could potentially be exposed to STZ.

3. INTRODUCTION

Routes of exposure include inhalation, ingestion, accidental injection and dermal absorption (See 6.1). STZ is cytotoxic to pancreatic β -cells, and is used to induce diabetes in animal research. In addition, STZ is a highly hazardous substance, suspected carcinogen, mutagen, teratogen and reproductive toxin. No occupational exposure limit has been established for STZ, therefore, the following instructions shall be adhered to when handling STZ and animals administered STZ. STZ is excreted in the feces and urine of animals after administration, consequently, these instructions **MUST** be followed when handling animals and bedding for **three (3) days** after the final administration.

4. EXPOSURE CONTROLS

- 4.1. Use of STZ **MUST** be described in the Animal Use Subcommittee (AUS) approved Animal Use Protocol (AUP).
- 4.2. Laboratory workers **MUST** receive specific training regarding the proper handling of STZ, documented in their laboratory safety manual.
- 4.3. Pregnant or breastfeeding women, or either gender trying to conceive should consult institutional specific Occupational Health (See 5.6) prior to handling STZ or animals that have been administered STZ.
- 4.4. Any handling of STZ, including weighing, solution preparation, and drawing doses **MUST** be done in certified Chemical Fume Hood. Minimum Personal Protective Equipment (PPE) that **MUST** be worn when handling STZ:
 - 4.4.1. Double Nitrile Rubber (0.11mm) Gloves;
 - 4.4.1.1. Gloves **MUST** be long enough so that there is no skin exposed between the glove and sleeve;
 - 4.4.2. Canadian Standards Association (CSA) Approved Safety Glasses; and
 - 4.4.3. Lab Coat, Tyvek™ or Back-Closure Gown
- 4.5. Minimum PPE that **MUST** be worn when administering or handling animals that have been administered STZ:
 - 4.5.1. Double Nitrile Rubber (0.11mm) Gloves;
 - 4.5.1.1. Gloves **MUST** be long enough so that there is no skin exposed between the glove and sleeve;
 - 4.5.2. CSA Approved Safety Glasses;
 - 4.5.3. Lab Coat, Tyvek™ or Back-Closure Gown; and
 - 4.5.4. Individually Fit-tested NIOSH-Approved N-95 Respirator
- 4.6. All cage manipulations and handling of animals that have been administered STZ **MUST** be performed in a certified Biological Safety Cabinet (BSC) for **three (3) days** after the final administration.

5. PROCEDURES

- 5.1. All procedures **MUST** be completed while wearing the appropriate PPE stated above.
- 5.2. Conducting animal work in a BSC:
 - 5.2.1. A layer of towels moistened with appropriate disinfectant (See 5.3) **MUST** be placed on the work surface of the BSC prior to opening cages and handling animals that have been exposed to STZ.

- 5.2.2. The BSC **MUST** be wiped down with paper towel moistened with disinfectant (See 5.3) at the end of each use. After wiping with disinfectant, BSC **MUST** be wiped with alcohol to prevent corrosion of BSC.
- 5.3. Areas where STZ is prepared and/or administered **MUST** be cleaned and decontaminated immediately following each procedure. Spills or surfaces potentially contaminated with STZ should be routinely cleaned with the appropriate solution:
- 5.3.1. Clidox - 1:5:1 solution (base : water : activator) - Fume Hood or BSC
- 5.3.2. Bleach Solution (10%) - Floor & Cage Dunking
- 5.4. Animal husbandry:
- 5.4.1. Cages of animals treated with STZ **MUST** be clearly labeled with Hazardous Chemical Cage Card including:
- 5.4.1.1. "Streptozotocin"
- 5.4.1.2. Date of STZ administration
- 5.4.1.3. Contact Name and Numbers (Both Laboratory & After Hours)
- 5.4.2. Animal cages should not be changed for a minimum of **three (3) days** after the final STZ administration.
- 5.4.3. On the first cage change following STZ administration, the cage bedding is considered contaminated and **MUST** be changed in the following manner:
- 5.4.3.1. Within the BSC, dump & scrape out the dirty bedding from **one cage at a time** from up to 14 cages into a garbage bag or labeled hazardous waste bag and placed in container for disposal according to institutional specific hazardous waste program (See 5.5)
- 5.4.3.2. When finished dumping & scraping up to 14 cages seal the bag and wipe the outside of bag with the appropriate disinfectant (see 5.3).
- 5.4.3.3. Dirty Water – dispose of directly down the sink drain. It does NOT need to be treated.
- 5.4.3.4. Once removed from the BSC the cages, bottles, sipper tubes and other housing supplies are to be dunked in an appropriate disinfectant (see 5.3) and placed on the cart for transport to cage wash area.
- 5.4.3.5. After this first cage change, new cages can be handled using universal laboratory precautions & PPE.
- 5.5. Laboratory Waste & Carcass Disposal:
- 5.5.1. Items contaminated or potentially contaminated with STZ and infected carcasses **MUST** be double bagged, labeled as Hazardous Waste and placed in specified containers for removal by institutional specific hazardous waste management program. [Western's Hazardous Material Management Handbook](#) , [LHSC Waste Management Program](#), [St. Joseph's Waste Management Program](#)
- 5.6. Emergency Procedures:
- 5.6.1. In the case of an exposure to eyes or skin, flush the area for 15 to 20 minutes with running water.
- 5.6.2. During Business Hours bring the MSDS (See 6.1) to Institutional specific Occupational Health:
- 5.6.2.1. Western Workplace Health UCC25 Ext. 82047
- 5.6.2.2. Occupational Health & Safety Services; VH-Ext. 52286, UH-Ext 33201, or SJHC Ext. 64332
- 5.6.3. After Business Hours bring the MSDS (See 6.1) to the nearest Hospital Emergency Department
- 5.6.4. Inform supervisor, who shall complete an Accident/Incident Reporting & Investigation Form [Western's Form](#), [LHSC's AEMs reports](#) (Intranet only), St. Joseph's Form (See OHSS Office for the form)

6. RESOURCES & RELATED DOCUMENTS

- 6.1. For current MSDS, search Product # S0130 on Sigma-Aldrich Website [Hyperlink](#)
- 6.2. ACVS Chemical SOP SAF-001 [Hyperlink](#)
- 6.3. The synthesis of streptozotocin and its distribution and excretion in the rat (1974) Karunanayake, E. H. et al. *Biochem* 142, 673-683.