Streptozocin

Standard Operating Procedure

Revision Date: 02/13/24

This standard operating procedure (SOP) outlines the handling and use of Streptozotocin. 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 Streptozotocin. All laboratory workers must read and understand the [*Laboratory Emergencies SOP*](https://ehs.umich.edu/wp-content/uploads/2022/05/LaboratoryEmergencyProceduresSOP.docx) prior to commencing any work in a laboratory.

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

Streptozoticin (CAS # = 18883-66-4) is an antineoplastic antibiotic produced by Streptomyces achromogenes variant or by synthesis. Streptozotocin can inhibit DNA synthesis. It is classified as a nitrosourea derivative used mainly in the treatment of pancreatic carcinoma. It is also used experimentally to induce diabetes in laboratory animals.

Synonyms: streptozoticin, streptozotocin, STZR, STZ, antineoplastic nitrosourea/cytotoxic/antibiotic

## Process

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

* Carcinogenic.
* Cytotoxic.
* Possible respiratory sensitizer.
* May be harmful to the fetus/ embryo.
* Inhalation, skin contact and/or ingestion may produce health damage.

## Swallowed

* Accidental ingestion of the material may be damaging to the health of the individual.
* The killing action of antineoplastic drugs used for cancer chemotherapy is not selective for cancerous cells alone but affect all dividing cells. Acute side effects include loss of appetite, nausea and vomiting, allergic reaction (skin rash, itch, redness, low blood pressure, unwellness and anaphylactic shock) and local irritation. Gout and renal failure can occur.

## Eye

Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. The material may produce foreign body irritation in certain individuals.

## Skin

* The material is not thought to be a skin irritant (as classified using animal models). Abrasive damage however, may result from prolonged exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
* Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
* Open cuts, abraded or irritated skin should not be exposed to this material.
* Entry into the blood-stream through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

## Inhaled

* The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless, inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
* Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.
* Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

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

* Use of chemical fume hood is required for all tasks with potential of aerosolizing streptozoticin including weighing, preparation and reconstitution.
* Syringes used for STZ injection must be safety engineered (self-sheathing syringes, luer-lock syringes, etc.).

In animal containment housing:

* Discard needles in proper sharps container without recapping.
* Utilize restraint devices if possible.
* Administer hazards to animals in Biological Safety Cabinet.

# Work Practice Controls [Provide additional information as it pertains to your research protocol]

* Designate areas where streptozocin are stored or manipulated.
* Decontamination should consist of surface cleaning with water and detergent followed by thorough rinsing. The use of detergent is recommended because there is no single accepted method of chemical deactivation for all agents involved. A plastic backed absorbent pad should be placed under the work area during the process. This should be changed at the end of each procedure or when a spill occurs.

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

PPE requirements in the lab include double gloves, lab coat, safety glasses or goggles, and closed-toe shoes. Gloves should be changed frequently and be pulled up over sleeves if possible to reduce the likelihood of any exposed skin. Wash hands and arms immediately after working with the substance.

PPE requirements must be followed according to ULAM guidelines and requirements found on the door outside of the animal containment room.

In containment housing PPE for administration includes double gloves, waterproof gown, safety glasses, shoe covers.

* Before working in Containment Housing, staff must complete ULAM Hazard Containment Training Parts 1 & 2.

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

* Keep containers of streptozocin tightly closed and stored in a well-ventilated place.
* Check SDS for specific storage requirements.
* Streptozocin is regulated by DOT as a Hazardous Material as well as through IATA Transport of Dangerous Goods.
* A secondary container is required for transportation to the vivarium space.

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

All hazardous chemical agent contaminated waste should be placed in a 5-gallon white pail. The container must be closed except when actively adding waste. The container must be located in the area where hazardous drugs are being used. All items contaminated by hazardous drugs, including gloves, syringes, vials needles, and solution containers must be disposed according to Environment, Health & Safety (EHS) guidelines.

Sharps – place needles, syringes with needles attached and other breakable items into appropriately labeled sharps containers.

Empty stock vials, reagent bottles, etc. – triple rinse with copious amounts of water. Deface label with black magic marker or scraper. Place in a cardboard box for disposal.

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 EHS Hazardous Materials Management (HMM)**. Contact EHS-HMM at (734) 763-4568 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also, refer to the EHS [Hazardous Waste](http://ehs.umich.edu/haz-waste/) Web page for more information.

# Emergency Reporting

Report all emergencies, suspicious activity, injuries, spills, and fires to the University of Michigan Police (DPSS) by calling 911 or texting 377911. Register with the [University of Michigan Emergency Alert System](http://dpss.umich.edu/emergency-management/alert/) via Wolverine Access.

# Training of Personnel

All personnel are required to complete the ***General Laboratory Safety Training*** session (**BLS025w** *or equivalent*) via the [EHS My LINC](http://ehs.umich.edu/education/) Web page. Furthermore, all personnel shall read and fully adhere to this SOP when handling streptozocin.

# Certification

I have read and understand the above SOP. I have received prior approval from my Lab Director to perform this procedure. I agree to contact my Lab Director if I plan to modify this procedure.

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

03-23-2018 Put into EHS format, changed department name, and fixed links.  
 Revised Spill Procedure section (AKJ).

04-09-18 Revised formatting (AKJ).

04-23-18 Changed injury type and action from paragraph to table format (AKJ.

03-04-19 Updated links, certification and format (DML).

05-17-23 Reviewed and updated (IWT).

02-13-24 Reviewed and updated (IWT)