Fluorouracil

Standard Operating Procedure

Revision Date: 02/13/24

This standard operating procedure (SOP) outlines the handling and use of 5-FU. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques. 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]

Fluorouracil is an anti-metabolite antineoplastic/chemotherapeutic medication. It is used as an injection for various cancers and as a topical for skin cancer. Fluorouracil inhibits DNA synthesis.

Synonyms: 5-fluorouracil, 5-FU,

Tradenames: Adrucil, Carac, Tolak, Efudex, and Fluoroplex

## Process [Write the steps for using the chemical in your research protocol]

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

* Harmful by inhalation, in contact with skin and if swallowed.
  + Swallowed: Accidental ingestion of the material may be harmful
  + Acute side effects from ingestion include loss of appetite, nausea and vomiting, allergic reaction (skin rash, itch, redness, low blood pressure, and anaphylactic shock) and local irritation. Gout and renal failure can occur.
  + Eye: This material can cause eye irritation and damage in some persons.
  + Skin: Contact with the material may be harmful; systemic effects may result following absorption.
    - This material can cause inflammation of the skin on contact in some persons.
    - The material may accentuate any pre-existing dermatitis condition.
    - 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: Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.

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.

* Environmental Hazard - Very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

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

All weighing, preparation and reconstitution should take place in a fume hood within the lab.

All animal administration must take place inside of a Biosafety Cabinet (BSC) in the animal containment space.

Collecting of tissues and necropsies must be performed inside of a fume hood or BSC while animals are in containment housing.

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

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 process or when a spill occurs.

All materials must be transported in a secondary container.

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

Personal protective equipment includes a lab coat, safety glasses and double gloves.  Gloves should be changed frequently. Wash hands and arms immediately after working with the substance.

Double gloves must be worn with animal administration or when working with needles.

PPE in the animal containment room for animal administration include double gloves, waterproof gown, safety glasses, show covers.

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

* Ensure access to chemical is restricted.
* Keep away from strong oxidizers, heat, and light.
* Secondary containment is required when transporting the material through the lab and to the vivarium space.

Fluorouracil is regulated by DOT as a Hazardous Material as well as through IATA Transport of Dangerous Goods.

# 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 should 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 fluorouracil.

# Certification

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

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| Laboratory Director | Revision Date |

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

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| Date | Revision |
| 09-14-18 | EHS name and logo were added, updated the formatting, and revised the content under Exposure/Unintended Content (AKJ). |
| 03-04-19 | Reviewed and updated. |
| 05-17-23 | Reviewed and updated (IWT) |
| 02-13-24 | Reviewed and updated (IWT) |