PURPOSE & Description

The purpose of this SOP is to delineate minimum standards for the use and handling of Fluorouracil (5-FU) in animals and the administration of 5-FU to rodents by injection. Fluorouracil is a nucleoside metabolic inhibitor that interferes with the synthesis of deoxyribonucleic acid (DNA) and to a lesser extent inhibits the formation of ribonucleic acid (RNA); these affect rapidly growing cells and may lead to cell death. Fluorouracil is converted to three main active metabolites: 5-fluoro-2′-deoxyuridine-5′-monophosphate (FdUMP), 5-fluorouridine-5′triphosphate (FUTP) and 5-fluoro-2′-deoxyuridine-5′-triphosphate (FdUTP). These metabolites have several effects including the inhibition of thymidylate synthase by FdUMP, incorporation of FUTP into RNA and incorporation of FdUTP into DNA.

Scope

This SOP applies to the Principal Investigator (PI) and their laboratory staff.

Responsibilities

PIs are responsible for training of their laboratory staff and continued participation in following safety guidelines.

PI and laboratory staff are responsible for following the [Policy on Handling Animals Exposed to Hazardous Chemicals](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Policy-on-Handling-Animals-Exposed-to-Hazardous-Chemicals.pdf).

Definitions

* **Clear time** – The period of time required to allow for excretion of a hazardous chemical before standard handling practices can be used.
* **Safety-engineered sharps** –a non-needle sharp or needle device with a built-in safety feature or mechanisms that effectively reduces the risk of an exposure incident. More information on safety engineered sharps can be found here: [[UF EHS Safety-Engineered Sharps Fact Sheet](https://webfiles.ehs.ufl.edu/Safety_Eng_Sharps.pdf#:~:text=What%20is%20a%20safety-engineered%20sharp%3F%20The%20U.S.%20Occupational,effectively%20reduces%20the%20risk%20of%20an%20exposure%20incident.%E2%80%9D)](https://webfiles.ehs.ufl.edu/Safety_Eng_Sharps.pdf#:~:text=What%20is%20a%20safety-engineered%20sharp%3F%20The%20U.S.%20Occupational,effectively%20reduces%20the%20risk%20of%20an%20exposure%20incident.%E2%80%9D).

Hazard Identification & Control Measures

**Potential Hazards**

* **Physical Hazards**
  + Needlestick
* **Chemical Hazards**
  + Acute toxicity
  + Carcinogenicity

Hazard Identification & Control Measures CONT.

**Engineering Controls / Administrative Controls**

* Use of an Animal Transfer Station (ATS) or higher engineering control such as a Biosafety Cabinet (BSC) or Chemical Fume Hood (CFH) is required for agent administration and cage manipulation.
* Syringes used for injection should comply with the details outlined in [UF EHS Safety-Engineered Sharps Fact Sheet](https://webfiles.ehs.ufl.edu/Safety_Eng_Sharps.pdf#:~:text=What%20is%20a%20safety-engineered%20sharp%3F%20The%20U.S.%20Occupational,effectively%20reduces%20the%20risk%20of%20an%20exposure%20incident.%E2%80%9D).
* Rodents should be appropriately restrained prior to administration, as described in the approved Animal Use Protocol (AUP).
* Gloves should be changed frequently, at a minimum when contaminated with 5-FU or torn.
* Hands and arms should be washed with soap and water upon completion of procedure.

**Personal Protective Equipment (PPE)**

* Appropriate lab attire including skin protection, closed shoes, and eye protection.
* Long-sleeve gown or long-sleeve dedicated lab coat
* Gloves
  + Single gloves if using chemo-rated nitrile gloves (ASTM D6978 standard).
  + Double gloves if not using chemo-rated nitrile gloves (ASTM D6978 standard).
* N95 respirator also required if ATS, BSC, or CFH are not available.
  + Respirator use requires employee participation in the Respiratory Protection Program (See [UF EHS Respirator Protection Policy](https://www.ehs.ufl.edu/departments/occupational-safety-risk/industrial-hygiene-occupational-safety/respirator-protection-policy/)).

Procedure

* Prior to working with chemical hazards in rodents, all work must be described in an approved AUP.
* Contact the ACS facility manager where the rodents are housed at least 48 hours prior to use of the chemical hazard.

Special Handling and Storage Requirements

* 5-FU is excreted in the feces and urine of animals after administration, consequently, the procedures in this SOP must be followed when handling animals and bedding for 72 hours after the final 5-FU administration.
* 5-FU storage and transport containers should be shatter-resistant, 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.
* Personal protective equipment (PPE) as described above must be worn when handling 5-FU, in addition to any PPE requirements of the animal room. Hands and arms should be washed with soap and water after removing PPE.
* Needles and sharps used with 5-FU must be disposed of immediately in a sharps container. Do not bend or recap needles. Safety-engineered sharps should be used whenever possible.
* An approved solution must be used for decontamination of equipment and areas exposed to

5-FU.

Waste Disposal Procedures

* Contaminated and/or potentially contaminated laboratory PPE and laboratory consumables are disposed of as Non-Regulated Hazardous Waste.
* Contaminated and/or potentially contaminated bedding and PPE originating within the animal facility are disposed of as Non-Regulated Waste for Incineration according to the [Policy on Handling Animals Exposed to Hazardous Chemicals](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Policy-on-Handling-Animals-Exposed-to-Hazardous-Chemicals.pdf).
* Rodents euthanized or found dead prior to the clear time are identified, labeled, and disposed of according to the [Policy on Handling Animals Exposed to Hazardous Chemicals](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Policy-on-Handling-Animals-Exposed-to-Hazardous-Chemicals.pdf).

Emergency Response (Spill & Accident Procedures)

**Spills**

* If a small spill occurs, clean up with an approved solution (e.g. Peroxigard). Collect spilled material and clean up material into appropriately labeled, nonmetallic waste container.
* For large spills, call EH&S Chemical and Radioactive Waste Disposal group at 352-392-8400 for clean-up assistance.
* See [UF EHS Spill Response](https://www.ehs.ufl.edu/departments/research-safety-services/hazardous-waste-management/spill-response/#:~:text=Call%20EH&S%20Chemical%20and%20Radioactive%20Waste) for additional information

**Needlesticks**

* Allow to bleed freely. If necessary, control bleeding by applying direct pressure with a sterile gauze or bandage.
* Immediately wash with copious quantities of soap and water.
  + If eyes or mucous membranes are exposed, irrigate the area for at least 15 minutes with water.
* Seek medical treatment.
* Report the incident to the PI/supervisor and Environmental Health and Safety (352) 392-1591 and submit an online Injury /Incident Report (<https://apps.ehs.ufl.edu/incidents/>).

**If an emergency occurs outside of normal work hours, contact the University Police Department at 352-392-1111 or call 911.**

**Emergency Contact Numbers:**

* Principal Investigator: xxx-xxx-xxxx
* Lab Manager: xxx-xxx-xxxx
* Poison Control Center: 800-222-1222
* Emergency: 911
* EH&S: 352-392-1591

**Physical Address on Campus:**

[Add your lab’s address here.]

References

* [Policy on Handling Animals Exposed to Hazardous Chemicals](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Policy-on-Handling-Animals-Exposed-to-Hazardous-Chemicals.pdf)
* [[UF EHS Safety-Engineered Sharps Fact Sheet](https://webfiles.ehs.ufl.edu/Safety_Eng_Sharps.pdf#:~:text=What%20is%20a%20safety-engineered%20sharp%3F%20The%20U.S.%20Occupational,effectively%20reduces%20the%20risk%20of%20an%20exposure%20incident.%E2%80%9D)](https://webfiles.ehs.ufl.edu/Safety_Eng_Sharps.pdf#:~:text=What%20is%20a%20safety-engineered%20sharp%3F%20The%20U.S.%20Occupational,effectively%20reduces%20the%20risk%20of%20an%20exposure%20incident.%E2%80%9D)
* [UF EHS Respirator Protection Policy](https://www.ehs.ufl.edu/departments/occupational-safety-risk/industrial-hygiene-occupational-safety/respirator-protection-policy/)
* [UF EHS Spill Response](https://www.ehs.ufl.edu/departments/research-safety-services/hazardous-waste-management/spill-response/#:~:text=Call%20EH&S%20Chemical%20and%20Radioactive%20Waste)

Documents and attachments

List applicable forms and attachments here.