PURPOSE & Description

The purpose of this SOP is to delineate minimum standards for the use and handling of Bromodeoxyuridine (BrdU) in animals and the administration of BrdU to rodents in drinking water. BrdU is commonly used in research to detect replicating cells in living tissues. Bromodeoxyuridine (5-bromo-2'-deoxyuridine, BrdU) is a synthetic nucleoside that is an analogue of thymidine. BrdU can be incorporated into the newly synthesized DNA of replicating cells (during the S phase of the cell cycle), substituting for thymidine during DNA replication. Antibodies specific for BrdU can then be used to detect the incorporated chemical thus indicating cells that were actively replicating their DNA. Binding of the antibody requires denaturation of the DNA, usually by exposing the cells to acid or heat. BrdU can replace thymidine during DNA replication, it can cause mutations, and its use is therefore potentially a health hazard.

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).

PI or laboratory staff are responsible for contacting and meeting with ACS Facility Manager to start [Special Care by Principal Investigator - Rodent Policy](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Special-Care-by-Principal-Investigator-Rodent-Policy.pdf) or [Special Services Policy](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Special-Services-Policy.pdf).

Definitions

* **Clear time** – The time required for excretion of a hazardous chemical before standard handling practices can be used.

Hazard Identification & Control Measures

**Potential Hazards**

* Physical Hazards
  + Splash
* **Chemical Hazards:**
  + Cytotoxic
  + Reproductive Hazard
  + Teratogen

**Engineering Controls / Administrative Controls**

* Powdered BrdU requires the use of engineering control such as a Biosafety Cabinet (BSC) or Chemical Fume Hood (CFH) for agent preparation.
* Prepared BrdU solution requires the use of an Animal Transfer Station (ATS) or higher engineering control such as a BSC or CFH for agent administration and cage manipulation.
* Gloves should be changed frequently, at a minimum when contaminated with BrdU or torn, and before handling animals in other experimental groups.
* 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-sleeved gown or long-sleeved 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).
* If BrdU powder is being used within the animal facility, N95 respirator and safety goggles are required if 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 Animal Use Protocol (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

* BrdU 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 48 hours after the final BrdU administration.
* Women who are pregnant, expecting to become pregnant, or nursing should not handle or be exposed to BrdU or feces/urine of animals treated with BrdU.
* As BrdU exposure can impair the immune system; immunocompromised individuals should also use extreme caution when handling BrdU.
* BrdU 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.
* BrdU used in drinking water should be diluted in labs before transport to the animal facility.
  + Place prepared BrdU in a labeled secondary container for transport to the animal facility.
* An approved solution should be used for decontamination of equipment and areas exposed to BrdU.

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 date 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).
* Waste BrdU water from soiled water bottles will be poured into the soiled cage bottom and processed according to [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. 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.

**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)
* [Special Care by Principal Investigator - Rodent Policy](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Special-Care-by-Principal-Investigator-Rodent-Policy.pdf)
* [Special Services Policy](https://iacuc.ufl.edu/secure/wp-content/uploads/sites/3/Special-Services-Policy.pdf)
* [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.