



**Handling of BrDU in the RSF Animal Facility**

Approved by:	CMRC Institutional Animal Care and Use Committee	
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<b>TITLE</b>	:	<b>Handling of BrDU in the RSF Animal Facility</b>
<b>SCOPE</b>	:	This SOP is applicable to all research and Research Support Facility (RSF) personnel involved in the handling of BrdU, animals administered BrdU, and associated bedding and equipment exposed to BrdU in the animal facility.
<b>SOP OWNER</b>	:	IACUC & RSF
<b>PURPOSE</b>	:	To describe the procedures on how to safely handle BrdU, the animals, and associated bedding and equipment exposed to BrdU in the animal facility.
<b>EQUIPMENT</b>	:	None
<b>RELATED SOPS</b>	:	SOP Personal Protective Equipment – Barrier SOP Personal Protective Equipment – Semi-Barrier and Quarantine SOP Ventilated Cage Changing SOP Waste Removal SOP Animal Waste Disposal SOP Biohazard Waste Disposal

<b>GENERAL:</b>	<ul style="list-style-type: none"> <li>• BrdU is a common acronym for the chemical compound 5-Bromo-2'-Deoxyuridine.</li> <li>• Bromodeoxyuridine (BrdU) is a synthetic thymidine analog that gets incorporated into a cell's DNA when the cell is dividing (during the S-phase of the cell cycle).</li> <li>• Antibodies against BrdU that are conjugated to fluorescent markers can be used to label these cells, thereby providing visual evidence of cell division.</li> <li>• Animals treated with BrdU may be housed in non-containment areas.</li> <li>• While in laboratory space (non-RSF space) follow CMRC Safety Office chemical and biological safety in laboratories guidelines on hazardous waste disposal.</li> <li>• Since very low concentrations of BrdU are given to rodents by injection, and minute quantities are excreted, the caging and waste is handled as normal with no additional precautions.</li> <li>• Special labeling is not required of cages of rodents injected with BrdU unless otherwise directed by the CMRC Safety Office.</li> <li>• All tasks having potential for occupational BrdU exposure, i.e. mixing of doses, dose preparation, administering of injections, etc., should only be conducted by staff that have been authorized and properly trained by the PI for BrdU safe handling.</li> <li>• The focus of this SOP is the handling of rodents and their contact bedding and caging equipment exposed to BrdU, and if BrdU is to be given to larger animals and or use of caging with non-contact bedding, CMRC Safety Office should be consulted on proper handling and procedures.</li> </ul>
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**I. Definitions:**

**Carcinogen** – a cancer-causing substance or agent.

**Cytotoxic** – toxic to cells, cell-toxic, cell-killing. Any agent or process that kills cells.

**Mutagen** – a physical or chemical agent that changes the genetic information (usually [DNA](#)) of an [organism](#) and thus increases the frequency of [mutations](#) above the natural background level. As many mutations cause [cancer](#), mutagens are typically also [carcinogens](#).

**Teratogenic** – able to disturb the growth and development of an [embryo](#) or [fetus](#).

## II. Responsibility

A. CMRC research personnel using BrdU are responsible for following all procedures in this SOP.

B. Research Personnel are responsible for the routine care of animals administered BrdU.

C. CMRC Safety Office is responsible for:

1. Reviewing the Safety section of the Animal Study Protocols.
2. Ensuring the PI's description of BrdU complies with this SOP and other Safety Office guidelines for chemical and biological safety in laboratories.
3. Advising PIs on any safety issues regarding the use and handling of the hazards and any associated bedding and equipment exposed to the hazards.

### Safety:

- Review the Material Safety Data Sheet (MSDS) prior to working with BrdU.
- BrdU has cytotoxic and mutagenic properties and is strongly teratogenic. BrdU is suspected to be a human carcinogen.
- Wear the appropriate protective equipment such as gloves, lab coat, eye protection, mask and appropriate lab attire.
- Comply with any additional precautions as posted on the animal room door or cage.
- Care must be taken to prevent contact with skin, ingestion, inhalation, and contamination of clothing with BrdU.
- If BrdU comes into contact with clothing, remove immediately and wash skin under the area. Skin contact causes erythema (redness) and edema (swelling) with crusting and scaling of the area.
- All spills must be reported to the CMRC Safety Office.

## III. Administrative Controls

D. All tasks having potential for occupational BrdU exposure, i.e. mixing of doses, dose preparation, administering of injections, etc., should only be conducted by research personnel that have been authorized and properly trained by the PI for BrdU safe handling.

E. PIs will develop and implement standard operating procedures (SOPs) for training staff on the preparation and administration of BrdU with minimal potential for exposure.

F. Research personnel must contact the Director, RSF or Attending Veterinarian prior to injecting or administering BrdU to animals to ensure that special precautions for BrdU are identified and discussed.

G. Director, RSF:

1. Provides copies of this SOP to research personnel requesting use of BrdU in animals in the RSF animal facility.
2. Ensures that researchers have available and obtain the appropriate biological and chemical waste containers for solid and liquid wastes designated for chemical waste hauler.

## IV. BrdU Preparation

A. Wear appropriate PPE: gloves, lab coat, eye protection and mask when working with BrdU

B. Preparation and mixing of BrdU must be performed in a fume hood in PI laboratory spaces (outside of the RSF animal facility).

C. Place BrdU in syringes or small vials prior to transport to the RSF animal facility.

D. BrdU used in drinking water must be diluted in labs before transport to RSF animal facility.

E. Place prepared BrdU in a secondary container for transport to the RSF animal facility.

F. Remove all containers that contain BrdU, (e.g., vials, syringes) from the animal facility.

## V. Animal Handling and BrdU cage card labeling for Research Staff

A. Rodents administered BrdU by injection:

1. Appropriately restrain or sedate animals prior to injection.
2. RSF Staff will change bedding for cages where BrdU is administered to the animals as routine cage changes.
3. Research personnel must place the Chemical Alert notification card on the outside of the cage card holder and provide the following information:
  - a. Write "BrdU Administered"

B. Rodents administered BrdU in the drinking water:

1. Research personnel will change bedding for cages where BrdU is administered to the animals for 48 hours after last dose.
2. Research personnel must place the Chemical Alert notification card on the outside of the cage card holder, and provide the following information:
  - a. Write "BrdU in drinking water".
  - b. Write concentration of BrdU.
  - c. Indicate start and end dates of when BrdU precautions must be followed.

C. BrdU administered in fish tank water:

1. Research personnel will change all fish tanks where BrdU is administered in the water.
2. Research personnel must place a Chemical Alert notification card on the tank with the following information:
  - a. Write "BrdU is in tank water".
  - b. Write concentration of BrdU.
  - c. Indicate start and end dates of when BrdU precautions must be followed.

## VI. Cage Changing and Waste Disposal Procedures

A. Processing of cages that are flooded due to a leaking water bottle or disposal of unused liquid in the water bottles:

1. Change rodents into clean cage set ups immediately.
2. Transfer cage card holder with accompanying cage card(s) and Chemical Alert notification card.
3. Notify Director, RSF immediately so that research personnel can be contacted.
4. Empty liquid waste into chemical waste containers for chemical waste hauler.
5. Empty solid wet waste into appropriate chemical waste bags for chemical waste hauler.
6. Label container and/or chemical waste bag with the PI name, "BrdU waste" and date.
7. RSF staff dispose of the chemical waste.
8. Place empty dirty cages and caging equipment on the "dirty equipment" rack located in room or dirty cage wash room. Note: the cages may be processed as normal.

B. Place all contaminated sharps waste materials in appropriate sharps container.

C. Disposal of fish tank water containing BrdU:

1. Empty fish tank water containing BrdU into a container labeled for chemical waste hauler.
2. Place empty dirty fish tanks on the "dirty equipment" rack located in the room or glassware room. Note: The tanks may be processed as normal.

D. For spills, wipe-up or absorb excess liquid using paper or absorbent pads.

1. If a few drops of liquid is absorbed on pads or paper towels, dispose of this waste in chemical waste bags in the animal holding or procedure room.
2. If a spill entails the use and soaking of several paper towels (e.g., water bottle spills), dispose of this waste in a chemical waste bag.
3. Clean spill areas using the RSF approved disinfectant.
4. Report all spills to the CMRC Safety Office.

- E. Remove card from cage card holder once animals have been taken off the BrdU drinking water and placed in a clean cage.

#### **VII. Handling of BrdU Administered Rodent Carcasses**

- A. Process carcasses as normal as per the SOP on Carcass Disposal. All carcasses are incinerated so no additional measures are necessary.

#### **VIII. Waste Disposal**

- A. Follow SOP – Animal Waste Disposal and SOP - Biohazard Waste Disposal. All animal wastes are autoclaved prior to disposal so no additional measures are necessary.