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## 1. PURPOSE

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This document describes the guidelines for the use of 5-bromo-2'-deoxyuridine (BrdU) in animal research.

## 2. SCOPE

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This guideline applies to all research personnel or others at Western University and affiliated institutions, who are working with, or could potentially be exposed to BrdU.

## 3. INTRODUCTION

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BrdU is a synthetic thymidine analog that gets incorporated into a cell's DNA when the cell is dividing. BrdU is commonly used in the detection of proliferating cells in living tissues or as a cell cycle marker. BRDU is characterized as a mutagenic agent and may be harmful if ingested, inhaled or in contact with bare skin. The primary harmful effects are genetic mutation, anemia, reproductive disorders (fetal death or abnormality), cataracts, and skin irritation (See 6.1). Data in rodents suggests that BrdU may be excreted in the feces, urine, and saliva of animals after administration, consequently, these instructions **MUST** be followed when handling animals and bedding for **seven (7) days** after the final administration (See 6.3).

## 4. EXPOSURE CONTROLS

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- 4.1. Use of BrdU **MUST** be described in the Animal Use Subcommittee (AUS) approved Animal Use Protocol (AUP).
- 4.2. Laboratory workers **MUST** receive specific training regarding the proper handling of BrdU, documented in their laboratory safety manual.
- 4.3. Pregnant or breastfeeding women, or either gender trying to conceive should consult institutional specific Occupational Health (See 5.6.2) prior to handling BrdU or animals that have been administered BrdU.
- 4.4. Any handling of BrdU, including weighing, solution preparation, and drawing doses **MUST** be done in certified Chemical Fume Hood. Minimum Personal Protective Equipment (PPE) that **MUST** be worn when handling BrdU:
  - 4.4.1. Double Nitrile Rubber (0.11mm) Gloves;
    - 4.4.1.1. Gloves **MUST** be long enough so that there is no skin exposed between the glove and sleeve;
  - 4.4.2. Canadian Standards Association (CSA) Approved Safety Glasses; and
  - 4.4.3. Lab Coat, Tyvek™ or Back-Closure Gown
- 4.5. Minimum PPE that **MUST** be worn when handling animals and bedding of animals that have been administered BrdU:
  - 4.5.1. Double Nitrile Rubber (0.11mm) Gloves;
    - 4.5.1.1. Gloves **MUST** be long enough so that there is no skin exposed between the glove and sleeve;
  - 4.5.2. CSA Approved Safety Glasses;
  - 4.5.3. Lab Coat, Tyvek™ or Back-Closure Gown; and
  - 4.5.4. Individually Fit-tested NIOSH-Approved N-95 Respirator
- 4.6. All administrations, cage manipulations, and handling of animals that have been administered BrdU **MUST** be performed in a certified Biological Safety Cabinet (BSC) for seven (7) days after the final administration.

## 5. PROCEDURES

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- 5.1. All procedures **MUST** be completed while wearing the appropriate PPE stated above.
- 5.2. Conducting animal work in a BSC:
  - 5.2.1. A layer of towels moistened with appropriate disinfectant (See 5.3) **MUST** be placed on the work surface of the BSC prior to opening cages and handling animals that have been exposed to BrdU.

- 5.2.2. The BSC **MUST** be wiped down with paper towel moistened with disinfectant (See 5.3) at the end of each use. After wiping with disinfectant, BSC **MUST** be wiped with alcohol to prevent corrosion of BSC.
- 5.3. Areas where BrdU is prepared and/or administered **MUST** be cleaned and decontaminated immediately following each procedure. Spills or surfaces potentially contaminated with BrdU should be routinely cleaned with the appropriate solution:
- 5.3.1. Clidox - 1:5:1 Solution (base : water : activator) - Fume Hood or BSC; or
- 5.3.2. Bleach Solution (1:10 Dilution) - Floor & Cage Dunking
- 5.4. Animal husbandry:
- 5.4.1. Cages of animals treated with BrdU **MUST** be clearly labeled with Hazardous Chemical Cage Card including:
- 5.4.1.1. "BrdU";
- 5.4.1.2. Date of BrdU administration; and
- 5.4.1.3. Contact Name and Numbers (Both Laboratory & After Hours)
- 5.4.2. Animal cages should not be changed for a minimum of **seven (7) days** after the final BrdU administration.
- 5.4.3. On the first cage change following BrdU administration, the cage bedding is considered contaminated and **MUST** be changed in the following manner:
- 5.4.3.1. Within the BSC, empty & scrape out the dirty bedding from **one cage at a time** from up to 14 cages into a garbage bag or labeled hazardous waste bag and placed in container for disposal according to institutional specific hazardous waste program (See 5.5)
- 5.4.3.2. When finished dumping & scraping up to 14 cages seal the bag and wipe the outside of bag with the appropriate disinfectant (see 5.3).
- 5.4.3.3. Dirty Water – dispose of directly down the sink drain. It does NOT need to be treated.
- 5.4.3.4. Once removed from the BSC the cages, bottles, sipper tubes and other housing supplies are to be dunked in an appropriate disinfectant (see 5.3) and placed on the cart for transport to cage wash area.
- 5.4.3.5. After this first cage change, new cages can be handled using universal laboratory precautions & PPE.
- 5.5. Laboratory Waste & Carcass Disposal:
- 5.5.1. Items contaminated or potentially contaminated with BrdU and infected carcasses **MUST** be double bagged, labeled as Hazardous Waste and placed in specified containers for removal by institutional specific hazardous waste management program. [Western's Hazardous Material Management Handbook](#), [LHSC Waste Management Program](#), [St. Joseph's Waste Management Program](#)
- 5.6. Emergency Procedures:
- 5.6.1. In the case of an exposure to eyes or skin, flush the area for 15 to 20 minutes with running water.
- 5.6.2. During Business Hours bring the MSDS (See 6.1) to Institutional specific Occupational Health:
- 5.6.2.1. UWO Workplace Health UCC25 Ext. 82047
- 5.6.2.2. Hospital Occupational Health & Safety Services; VH-Ext. 52286, UH-Ext 33201, or SJHC Ext. 64332
- 5.6.3. After Business Hours bring the MSDS (See 6.1) to the nearest Hospital Emergency Department
- 5.6.4. Inform supervisor, who shall complete an Accident/Incident Reporting & Investigation Form [Western's form](#), [LHSC's AEMs reports](#) (Intranet only), St. Joseph's Form (See OHSS Office for the form)

## 6. RESOURCES & RELATED DOCUMENTS

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- 6.1. For current MSDS, search Product # B5002 on Sigma-Aldrich Website [Hyperlink](#)
- 6.2. ACVS Chemical SOP SAF-003 [Hyperlink](#)
- 6.3. Kitchin, K.T., & Brown, J.L (1995) Incorporation of 5-Iodo-2'-deoxyuridine and 5-Bromo-2'-deoxyuridine into Rodent DNA as Determined by Neutron Activation Analysis. *Analytical Biochem.* **229**, 180-187.