Standard Operating Procedure

**Bromo-Deoxyuridine (BrdU)**

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and
3) SOP has been signed and dated by the PI and relevant lab personnel.*

 Print a copy and insert into your
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:** [ ]  Process [x] Hazardous Chemical [ ]  Hazardous Class

**Purpose**

Bromo-Deoxyuridine (BrdU) is a reproductive toxicant. It is used to detect the proliferating cells in living tissue. BrdU can also be used to label cells undergoing S-phase synthesis. It is a thymidine analogue and gets incorporated in DNA. This SOP describes the safe usage and handling, and disposal of BrdU.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 59-14-3

Class: **Reproductive toxicant**

Molecular Formula: C9H11BrN2O5

Form (physical state): Solid; White needles when crystallized from absolute ethanol.

Color: white

Melting point: 191-194 O C

**Potential Hazards/Toxicity**

Toxic Effects: BrdU is a toxic substance.

Acute Effects: Wheeze and cough, shortness of breath, burning in the mouth,

 throat, or chest.

Chronic Effects: Reproductive disorders and genetic alterations. BrdU is incorporated into tissue DNA in place of thymidine in animals. BrdU-substituted DNA replaces normal DNA and chromosomal proteins are altered through: chromosome lengthening, chromatid breakage, and changed sister chromatid exchange frequencies. Meiosis and mitosis are affected.

Carcinogenic Effects: Brdu is suspected to be a carcinogen resulting in heritable genetic damage. It is harmful to the unborn child.

Mutagenic/Teratogenic Effects: BrdU is not mutagenic—Ames test; but BrdU is mutagenic—micronucleus and sperm abnormality assay. BrdU is a strong teratogen in rodents.

Systemic effects: BrdU integrates into DNA and affects the colon, stomach, bone marrow, and spleen.

**Personal Protective Equipment (PPE)**

**Respiratory Protection**

A ½ or full face respirator equipped with appropriate cartridges should be used any time there is the potential for exposure to vapor and/or dust and a fume hood cannot be used.

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand Protection**

Double Nitrile or chloroprene gloves are recommended. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with Bromo-Deoxyuridine (BrdU).

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

ANSI approved safety glasses or googles.

**Skin and Body Protection**

Lab coats should be worn. These laboratory coats must be appropriately sized for the individual and be buttoned to their full length. Laboratory coat sleeves must be of a sufficient length to prevent skin exposure while wearing gloves. Full length pants and close-toed shoes must be worn at all times by all individuals that are occupying the laboratory area. The area of skin between the shoe and ankle should not be exposed.

**Hygiene Measures**

Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse.

**Engineering Controls**

Always handle BrdU inside a certified chemical fume hood or a ducted biosafety cabinet. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**First Aid Procedures**

**If inhaled**

Remove rapidly to clean air. Administer rescue breathing if necessary and call emergency services. Seek medical attention if needed.

**In case of skin contact**

Remove contaminated clothing and wash skin with soap and water; avoid rubbing and increases in temperature. Seek medical attention promptly.

**In case of eye contact**

Rinse immediately with copious amounts of running water for at least 15 minutes. Seek attention of a licensed Ophthalmologist promptly.

**If swallowed**

Drink lots of water/milk. Induce vomiting. Seek medical attention (refer gastric lavage).

**Special Handling and Storage Requirements**

* Whenever feasible, procedures with the potential for producing BrDu aerosols should be conducted with a certified chemical fume hood.
* Needles used for BrdU injection will be disposed of in approved sharps containers immediately following use.
* Needles used for BrdU injection should never be bent, sheared, or recapped.
* **Storage:** Store in secondary containment with Reproductive Toxicant label on the primary container, secondary containment and the storage location. Keep containers tightly closed in a dry, cool, and well-ventilated place.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Clean areas where BrdU has been handled by adding water, followed with a soap and water wash.

No waste streams containing BrdU shall be disposed of in sinks or general refuse. Extra BrdU contaminated materials are to be disposed of as hazardous chemical waste.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with Bromo-Deoxyuridine (BrdU), designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

**Principal Investigator SOP Approval**

Print name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval Date:

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Date** |
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