STANDARD OPERATING PROCEDURE
FOR CARCINOGENS AND HIGHLY TOXIC MATERIALS

Principal Investigator(s):___________________________________________
Location(s):_____________________________________________________
Chemical(s): Ethidium Bromide

1. **Purchasing:**

All purchases of this material must have approval from the Principal Investigator before ordering. The user is responsible to ensure that a current Material Safety Data Sheet (MSDS) is obtained unless a current one is already available within the laboratory. Quantities of this material will be limited to the smallest amount necessary to complete the experiment.

2. **Use**

Ethidium Bromide is widely employed for rapid visualization of nucleic acids in electrophoretic gels. EtBr reacts with DNA and produces a fluorescent complex visible with UV light.

3. **Storage:**

Ethidium bromide should be stored and used inside a fume hood as a result of its mutagenicity. Store in a cool, dry place away from strong oxidizing agents. Keep containers tightly closed. Use with adequate ventilation.

Storage areas will be regularly inspected by________________________ to ensure safety.

Periodic inventory reductions will be scheduled.

4. **Authorized personnel:**

Use of this material requires prior written approval from

Title: N/A. (see Chemical Hygiene Plan for approval level requirements).

Use will be limited to the following personnel (check all that apply):

Principal Investigator _X_ Graduate students____

Technical staff __X_ Post doctoral employees____ Undergraduates ____

Other (describe) ______________________________
5. **Training requirements:**

The user must demonstrate competency and familiarity regarding the safe handling and use of this material prior to purchase. Training should include the following:

- Review of current MSDS
- Review of the OSHA Lab Standard
- Review of the Chemical Hygiene Plan
- Special training provided by the department/supervisor (Right to Know)
- Review of the departmental safety manual
- Safety meetings and seminars

6. **Use location:**

Materials shall be used only in the following designated areas in room

Use process enclosures, local exhaust ventilation or other engineering controls such a fume hood or weighing hood to reduce dust concentrations as low as reasonably achievable. Engineering controls should be used whenever feasible to maintain airborne ethidium bromide concentrations at the lowest achievable levels.

Check all that apply:

- demarcated area in lab (describe)
- laboratory fume hood
- ONLY no open bench work
- fume hood __X__
- glove box __X__
- other (describe) _______________________

7. **Personal protective equipment:**

All personnel are required to wear the following personal protective equipment whenever handling this material (check all that apply):

- Chemical safety goggles  __X__
- Face shield _____
- Gloves (type)  Nitrile, Viton, PVC or Butyl Rubber
- Respirator (type) ________
- Rubber apron_____  Lab coat __X__
- Tyvek clothing ______
- Other (describe) _______________

Wear chemical safety goggles when using ethidium bromide. Avoid skin contact, ethidium bromide may be absorbed through the skin. Use rubber gloves.
8. **Waste disposal:**

The authorized person using this material is responsible for the safe collection, preparation and proper disposal of waste unless otherwise stated below. Waste shall be disposed of as soon as possible and in accordance with all laboratory and University procedures.

Specific instructions:
Liquid waste will be placed inside a Nalgene waste container. The nalgene container will have a safety waste funnel attached to it. The safety funnel has a hinged cover to keep emissions contained and spills to a minimum. This container also has a built in vent to minimize overflow. This material should be appropriately labeled with the name and the quantity. Solid waste that is unable to go into a nalgene container should be placed into a 6 mil poly bag or triple bagged into the normal trash bags. The bagged material should then be appropriately labeled with a hazardous waste label and set aside for pick up by the Department of Occupational Health & Safety. Dispose of waste through Occupational Health & Safety.

9. **Decontamination:**

Ethidium Bromide is widely employed for rapid visualization of nucleic acids in electrophoretic gels. EtBr reacts with DNA and produces a fluorescent complex visible with UV light.

Wash the area with a paper towel soaked in a decontamination solution consisting of 4.2g of sodium nitrite and 20mL of hypophosphorous acid (50%) in 300mL of water. Then wash five times with wet paper towels using a fresh towel each time. Soak all the towels in decontamination solution for 1 hour. Using a U- V light, check for completeness of decontamination, and if satisfied, then call DOHS for disposal of the decontamination solution.

The decontamination solution must be prepared just prior to use.

If the decontamination solution (pH 1.8) is felt to be too corrosive for the surface to be decontaminated, then use six rather than five washes following the decontamination solution wipe. Again, soak all the towels in decontamination solution for at least 1 hour before disposal.

10 **Exposures:**

Emergency procedures to be followed (from MSDS):

Potent mutagen and moderately toxic.

Acute toxic effects from ethidium bromide have not been thoroughly investigated. Ethidium bromide is irritating to the eyes, skin, mucous membranes and upper respiratory tract. Although there is no evidence of carcinogenicity or teratogenicity of this substance in humans, ethidium bromide is strongly mutagenic and therefore should be regarded as a possible carcinogen and reproductive toxin.

In the event of skin contact, immediately wash with soap and water and remove contaminated clothing. In case of eye contact, wash with copious amounts of water for 15 minutes and obtain medical attention. If ethidium bromide is ingested, obtain medical attention immediately.
11 **Spills:**
Spill cleanup materials to be used, location of materials, PPE to be used, disposal of cleanup materials, etc. Please be as complete as possible:

Wash the area with a paper towel soaked in a decontamination solution consisting of 4.2g of sodium nitrite and 20mL of hypophosphorous acid (50%) in 300mL of water. Then wash five times with wet paper towels using a fresh towel each time. Soak all the towels in decontamination solution for 1 hour. Using a U- V light, check for completeness of decontamination, and if satisfied, then call DOHS for disposal of the decontamination solution.

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12. **Emergency Phone Numbers:**

Campus Police 9-911

Occupational Health & Safety X8475

13. **Other Special precautions:**