	Ethidium Bromide Handling and Disposal Practices	Document Number: Effective Date: 8/12/06 Revision Date:

1.0 Purpose and Applicability

1.1 The following document describes the procedures for the proper handling and disposal of Ethidium Bromide.

1.2 These procedures must be followed by all who work with Ethidium Bromide.

2.0 Definitions

2.1 Ethidium Bromide - Ethidium Bromide (EtBr) is commonly used as a non-radioactive marker for identifying and visualizing nucleic acid bands in electrophoresis and in other methods of gel-based nucleic acid separation. EtBr is dark red, crystalline, non-volatile solid, moderately soluble in water, which fluoresces readily with a reddish-brown color when exposed to ultraviolet light (UV). Although it is an effective tool, its hazardous properties require special safe handling and disposal procedures.

3.0 Roles and Responsibilities

3.1 **Principal Investigator** – Individual responsible for ensuring that all lab occupants are aware of the hazards associated with EtBr and are trained in the proper handling and disposal procedures.

3.2 **EH&S Biosafety Program Head** – Responsible for advising researchers on EtBr safe handling and disposal procedures.

4.0 Procedures

4.1 **Safety Precautions** - Ethidium Bromide is a potent mutagen and is moderately toxic after an acute exposure. EtBr can be absorbed through skin, so it is important to avoid any contact with the chemical. EtBr is also an irritant to the skin, eyes, mouth and upper respiratory tract. Good work practices can help reduce hazardous exposure.

1. To prevent inhalation exposure, work with EtBr powder or crystals in a fume hood, or work with **premixed** EtBr solutions or tablets to avoid handling the powder directly.

2. To prevent skin contact when working with liquid solutions, wear nitrile gloves, a laboratory coat, and safety goggles. Change gloves frequently.

3. Review an EtBr Material Safety Data Sheet (MSDS) and this EH&S fact sheet before handling the material.

4. Wear eye protection and ensure that there is unobstructed access to an eyewash/shower unit in the work area.

5. As with any chemical, to avoid ingestion do not eat or drink where EtBr is handled, processed, or stored.

6. Always wash hands thoroughly after handling EtBr, even when gloves are used.

7. Wear UV-blocking eyewear or work behind a UV shielding glass when using ultraviolet light to visualize EtBr.

4.2 **Disposal Procedures for Ethidium Bromide**

EtBr wastes are not regulated by the State of Massachusetts or the EPA. The wastes are prudently managed by laboratory staff and EH&S to minimize human and environmental exposure. Please follow the instructions listed in the following table when handling EtBr:

Waste Stream	Description	Waste Disposal Procedure
Buffer	Typically contain very small concentrations of EtBr (<0.5 mg/L)	Dispose as hazardous waste. Contact EH&S for a waste pick-up.
Stock solutions	Typically contain higher concentrations of EtBr (1–10 mg/ml)	Dispose as hazardous waste in original container. Contact EH&S for a waste pick-up.
Gels	Typically contain lower concentrations of EtBr (3–5 mg/L)	Allow gels to dry out then place in clear, labeled bags. Dried gels may be bagged with EtBr-contaminated debris. Contact EH&S for a waste pick-up.
Contaminated Debris	Gloves, spill cleanup materials, and other lab supplies contaminated with EtBr	Broken glassware and sharps must be placed in puncture-resistant containers. Other debris may be placed in clear, labeled bags. Contact EH&S for a waste pick-up.
Crystals and powders	Typically pure or concentrated EtBr	Dispose of EtBr crystals and powders through EH&S. Contact EH&S for a waste pick-up.

Please note that studies have shown that treatment with hypochlorite does little to diminish the mutagenic properties of Ethidium Bromide.

4.3 **Spills and Decontamination**

1. Use soap and water mixture (detergent solution) or 70% ethanol to wipe clean laboratory work surfaces contaminated with ethidium bromide.

2. Use a UV light to survey work surfaces in the laboratory to ensure that the ethidium bromide has been removed.

4.4 **Emergency Exposures**

1. **Eye care -** If EtBr comes in contact with the eyes, immediately flush them with copious amounts of cold or cool water for at least 15 minutes, preferably in emergency eyewash.

2. **Skin care -** In the event of skin exposure, remove contaminated clothing and immediately wash the affected area with soap and copious amounts of cold or cool water for 15 minutes.

3. **If swallowed or inhaled -** In the case of EtBr ingestion, obtain medical attention immediately. If EtBr dust is inhaled, move the victim to a source of fresh air.

5.0 Key References

5.1 If you have any questions, please contact the EH&S Biosafety Program Head at: 545-2682.