Chapter 5 – BIOHAZARDOUS UNWANTED MATERIALS MANAGEMENT

This chapter describes management of Biohazardous Unwanted Materials. Use of proper sterilizing and disinfecting methods should be the primary treatment techniques for deactivating and disposal of biohazardous material as regular solid waste. If you suspect that a proposed activity might produce biohazardous materials that are difficult or expensive to dispose, or have multiple hazards (biohazard, chemical, radioactive) contact EHS for guidance before conducting your activity.

5.1 Biohazardous Unwanted Materials Description

Biohazardous Unwanted Material and products that have not been rendered innocuous or determined non-infectious by the Principal Investigator or their authorized representative should be considered infectious. These include:

- Blood and blood products - human blood, blood products (serum, plasma and other blood components) and body fluids.
- Sharps - needles, syringes, scalpels and glass vials (see Appendix J)
- Microbiologicals – including all cultures and stocks of biohazardous material (see Section 1.2).
- Pathologicals - including tissues, organs, body parts, all transgenic animal parts and carcasses discarded from surgical, obstetrical, autopsy and laboratory research procedures.
- Broken glass that can be properly decontaminated should not be placed in the Biohazardous Unwanted Materials system (see Appendix J).

5.2 Unwanted Biohazardous Materials Disposal Policy

The disposal or inactivation of biohazardous unwanted materials must be a part of experimental procedure planning prior to the start of laboratory research. Disposal or inactivation of unwanted biohazardous material must be described within the "Risk Assessment" portion (#13.d.) of each Institutional Biosafety Committee Application for research involving any recombinant or synthetic nucleic acid molecules (see *NIH Guidelines* Appendix G for additional information) and/or work with risk group 2 and/or higher agents. Unwanted biohazardous materials will be handled depending on the type of material (i.e. solid or liquid) and what is required to assure inactivation of the material.

Inactivating unwanted biohazard liquids: such as media drawn from cultures must be chemically inactivated by a disinfectant that can effectively inactivate the organism of study such as a sodium hypochlorite (bleach) solution. The volume of unwanted biohazard liquid must be calculated and standard household bleach must be added to equal a 10% solution. The liquid must be left for at least 30 minutes to several hours to allow for complete inactivation of the material—for larger volumes, allowing the material to remain in a large collection flask overnight is preferable. The chemically inactivated material can usually be disposed down a laboratory sink with copious amounts of water. For disposal of large liquid volumes (such as 1 liter of material daily or more) researchers must contact EHS for a hazardous waste disposal determination. During initial experimental setup, the assessments for inactivation of certain organisms may involve culturing following chemical inactivation to assure the inactivation method is consistently effective. NOTE; Material treated by a sodium hypochlorite solution must never be placed in an autoclave.

Inactivation of unwanted plant materials, solids and soil or plant related microorganisms: must be inactivated by sterilization using an autoclave (high pressure and high temperature steam). Because unwanted biohazardous plant materials, soil, and soil or plant related organisms can pose a potential environmental risk, these items must be inactivated on site. See Appendix I of the MU Biosafety Manual for additional information on use of autoclaves for sterilization of unwanted biohazard plant materials and soils. NOTE: Autoclaves used for inactivation of these materials must be periodically tested to confirm they are

function properly, as required by the *NIH Guidelines*. Appropriate testing method and frequency are included in Appendix I of the MU Biosafety Manual.

Inactivation of unwanted laboratory solid materials and small volumes of liquid (off site): must be placed in the unwanted biohazardous materials waste stream. The MU Department of Environmental Health & Safety maintains a contact with a biohazardous waste vendor and there are numerous biohazardous waste pickup locations on the MU campus. Unwanted laboratory solid material such as: benchcoat, used laboratory gloves, culture plates, and closed sharps containers must be placed in biohazard bags within the vendor biohazard boxes or hard shelled biohazard plastic totes. This method must also be used for disposal of unwanted human blood vials or human tissues. NOTE: Disposal of any identifiable human tissues requires a special red tag "Pathological Waste---For Incineration Only" to assure the vendor is aware the waste container must be incinerated.

Disposal of unwanted animal carcasses (off site): All animals carcasses generated on the MU campus are required to be disposed by incineration or in biohazard waste containers for pickup by the biohazard waste vendor. Carcasses are typically stored in refrigerators/freezer or coolers to assure the carcasses are temperature controlled until just before a regular biohazard waste pickup. Just prior to the biohazard waste pickup date/time, laboratory or animal care staff must package the carcasses in containers provided by the biohazardous waste vendor and then placed in the pickup location. Carcasses are placed in biohazard bags which are then placed in either cardboard biohazard boxes or hard shelled biohazard plastic totes are supplied by the vendor. Consider the amount and weight (weight of items per container must not be over 40 pounds) of the carcasses being placed in containers. It is recommended that hard shelled biohazard plastic totes be used for disposal of larger numbers of animal carcasses. NOTE: These animal carcasses must be identified with a special red tag "Pathological Waste---For Incineration Only" to assure the vendor is aware the material must be incinerated. MU requires incineration of all animal carcasses to assure the institution meets *NIH Guideline* Appendix Q-I-B-1 concerning disposal of animals containing recombinant or synthetic nucleic acid molecules.

Biohazardous Unwanted Materials that have not been sterilized must be disposed by EHS or a biohazardous waste disposal vendor approved by EHS. Biohazardous Unwanted Materials must be properly labeled, packaged, and stored prior to transport.

Packaging and Labels – Packaging and labels will be provided by EHS or their authorized biohazard waste disposal vendor, with the exception of special packaging for articles that could potentially puncture bags or boxes.

- Articles that could puncture bags or boxes ("sharps") must be placed in puncture-proof containers available from University Hospital Materials Management (882-2805), or from other commercial sources. The full sharps container must then be placed into the EHS or authorized biohazardous waste vendor's box or plastic tote provided. Refer to Appendix J for specific information.

- All biohazardous materials including diagnostic specimens and biological products must be packaged to prevent leakage of contents during handling and transportation. Leaking containers or improperly packaged sharps will not be accepted by EHS or authorized biohazardous waste vendors.

- Label all containers of biohazardous waste with the date when accumulation begins. EHS has provided instructions on how this label is to be filled out on the Environmental Management webpage. There is a yellow *Caution-Hazardous Material* label (EHS HML 08/05) available from EHS for this information.

Dispose of biohazardous waste in a timely fashion: According to MU policy, all containers of biohazardous material are to be turned over to EHS within six (6) months of the accumulation start date. All material that could become putrid must be refrigerated until picked up by EHS or authorized biohazardous waste vendors.

Avoid large accumulations of biohazardous waste. Collection from individual laboratories is arranged by contacting EHS via submission of a Pick-Up Request Form (PURF). Collection points for biohazards do not require a PURF and are available at several locations on campus that may be more convenient for some laboratories. Contact EHS for the nearest collection point location and to determine availability. If a collection point is not available, you will need to use and complete the PURF information.

Segregate biohazardous material from unwanted chemical and radioactive materials: Multiple hazard (biohazard, chemical, radioactive) segregation must take all potential hazard classifications into account. Unwanted chemical and/or radioactive materials must never be placed in an autoclave. Contact EHS for assistance.

Use compatible containers and closures: Containers for biohazardous material must be in good condition, not react with other materials present and supplied by EHS or authorized biohazardous waste vendors.

Good housekeeping: Good housekeeping is the most important action to improve safety and minimize waste. Clean up spills and releases promptly and thoroughly using approved methods.

Training: Training on handling and disposal of biohazardous unwanted materials is provided free of charge by EHS to MU Faculty and Staff. To schedule training, please contact EHS (882-7018).

5.3 Biohazardous Material Laboratory Closure

Principal Investigators/Supervisors where biohazardous materials for recombinant or synthetic nucleic acid molecules or Biosafety Level 2 or 3 research activities are used must complete a proper Biohazardous Material Laboratory Closure prior to terminating biohazardous material use. This will ensure proper transfer or disposal of all biohazardous materials, decontamination of any remaining contaminated items, accurate MU inventory records, and removal of biohazard signs/labels. EHS approval is required prior to release of laboratories for unrestricted use.

The following procedure provides steps for proper Biohazardous Material Laboratory Closure:

- Contact the EHS Biological Safety Professional to discuss plans for changes or termination of activity (provide as much advanced notice as possible).
- Properly sterilize, dispose or transfer all remaining biohazardous material when all biohazardous material work has been completed in your approved area. Shared storage areas must be carefully reviewed by departing and sharing researchers to identify biohazardous material ownership.
- Decontaminate, clean and sanitize all potentially contaminated laboratory surfaces, equipment and fixtures (after a thorough survey to identify all rooms and equipment).
- Contact EHS to arrange for pick-up and disposal of Biohazardous Unwanted Materials that have not been sterilized.
- Schedule a closure survey with the EHS Biological Safety Professional and responsible Principal Investigator or Supervisor present. All labeled equipment, labware, fixtures, areas and rooms must be surveyed and de-labeled or de-posted by EHS before release for unrestricted use.

Radiation Safety and Environmental Management have similar inactivating, decommissioning, transfer, and change notification requirements for use of radioactive material and hazardous material, respectively. Refer to the Radiation Safety Manual and Hazardous Materials Management webpage for specific requirements. Below are useful links to areas specified within Chapter 5 with Hazardous Materials Management:

- Waste Management Box Closing Instructions
  http://ehs.missouri.edu/chem/pdf/waste-management-box-closing-instructions.pdf.

- Waste Management Medical Waste Container Document
  http://ehs.missouri.edu/chem/pdf/medical-waste-container.pdf.

- Biohazard Brochure
  http://ehs.missouri.edu/haz/pdf/biohazard-brochure.pdf.

- MU EHS Hazardous Material Label Instructions
  http://ehs.missouri.edu/chem/pdf/material-label-instructions.pdf.

- Medical Waste Training Sign
  http://ehs.missouri.edu/haz/pdf/med-waste-training-sign.pdf.

- Pathological Waste Tag Instructions
  http://ehs.missouri.edu/haz/pdf/red-path-tag.pdf