**Appendix D: Guidelines for Disposal of Infectious Waste**

**Infectious Waste Management Program**

Regulations imposed by local, state, and federal agencies dictate that infectious waste must be segregated, packaged, and disposed of in a specific manner. The primary purpose of the regulations is to limit on-the-job exposure to blood and other potentially infectious materials.

All wastes listed in this section must be segregated from other wastes, packaged, and disposed of in accordance with University guidelines. The Bellarmine University recognizes three basic types of waste:

1. **Medical Waste**
	1. Microbiological waste - Cultures and stocks of agents infectious to humans (including human, primate, and mammalian cell lines), associated biologicals (e.g., serums, vaccines, antigens, toxins), and culture dishes and devices used to transfer, inoculate or mix cultures (e.g., Petri dishes, vials, filtration devices, flasks, inoculation loops, disposable gloves).
	2. Human blood and blood products - i.e., all liquid blood, serum and plasma.
	3. Transgenic Plant Material - plant’s genetic material that has been altered by the introduction of genes from another organism.

1. **Sharps -** i.e., syringes, needles, razor blades , scalpels, broken glass pipets and vials; broken glass slides or cover slips that have been in contact with infectious material
2. **Pathological Waste**
	1. Human pathological waste - including tissue, organs, and body parts, and specimens of body fluids and their containers. .
	2. Animal wastes including carcasses, body parts, body fluids, blood, or bedding originating from animals known to be contaminated with (zoonotic organisms) or intentionally inoculated with infectious agents. Excludes preserved animals used for educational purposes.

 All of the above items must follow packaging and disposal guidelines for infectious waste. It is the responsibility of every department, unit, or laboratory generating infectious waste to provide the appropriate packaging materials (i.e., sharps container and orange or red infectious waste bags). Biohazard waste bags must be orange or red and can be obtained currently from the current biohazard waste disposal contractor, otherwise these may be obtained from laboratory supply companies (i.e., Fisher Scientific, 1-800-766-7000) .

**Infectious Waste****Segregation**

At the point of generation, Infectious waste is to be segregated by type and placed into separate containers for disposal. Laboratories and other infectious waste generating areas will separate each infectious waste stream into a 32-gallon red bin.

**Medical Waste:**
Medical waste will be placed in 32-gallon red bins lined with an approved biohazard bag. Place cultures and stocks of infectious agents, other biological including cell lines of human origin, cell lines of non-human origin which may be associated with zoonotic organisms, known or unknown organisms isolated from humans, tissues of human and non-human origin; and non-sharps items (e.g., culture swabs used to obtain human cultures, gloves, pipet tips, test tubes) and any materials contaminated with biohazardous materials into red bags that have the biohazard symbol or the word “BIOHAZARD”. Use double bags if necessary to prevent leakage. No tagging is necessary if the waste in these bins adheres to the "medical waste" definition.

**Sharps:**
All sharps must be placed in an approved sharp containers that are prominently labeled with a universal biohazard sign and the word "BIOHAZARD". To prevent contamination and potential injury, dispose of needles and syringes directly into a sharps container without any further manipulation (e.g., NO clipping, bending, breaking, shearing, or recapping). Devices that clip off the needle are prohibited. When the sharp container is full, it must be placed into a 32-gallon red infectious waste bin.

**Pathological:**
Pathological waste will be placed in 32-gallon red bins lined with an approved biohazard bag. These bins must be tagged "Pathological Waste." Pathological waste is defined as animal carcasses, body parts, body fluids, animal blood soaked materials, bedding, and associated containers can be infectious or noninfectious. Small animal carcasses contaminated with infectious agents (pathological waste) should be packaged in double red biohazard bags and refrigerated or frozen until they can be transported.

Note: Infectious waste must be segregated into the proper waste category, and into a properly labeled containment system at the point of generation. Biohazardous waste must be packaged, contained, and located in a way that protects and prevents its accidental release to the environment at any time. Waste minimization should be encouraged to reduce the amount of infectious waste that must be treated and disposed. Material that is not contaminated should be handled as outlined in the **“Standard Microbiological Work Practices”** section beginning on page 27.

It will be the responsibility of all Faculty or designated laboratory supervisors for ensuring that staff and students properly identify, segregate, package, store and dispose of Infectious Waste appropriately

**Infectious Waste****Definitions for Purposes of Waste Determination and Waste Segregatio**n

**Medical Waste**

1. Microbiological waste-i.e. stocks, and or cultures of etiological or infectious agents, including culture plates, test tubes, swabs, etc. contaminated with these agents.
2. Human blood, blood products-i.e. all liquid blood, serum and plasma. Body fluids to which universal precautions apply. Containers/equipment and articles contaminated with blood/blood products.
3. Medical/laboratory glassware including slides, pipettes, blood tubes, blood vials, contaminated broken glass.
4. Transgenic Plant Material - plant’s genetic material that has been altered by the introduction of genes from another organism.
5. Sharps-i.e. syringes, needles, and scalpel blades. All sharps need to be placed in a puncture-resistant, rigid container with the universal biohazard symbol on the container.

**Pathological Waste**

1. Human organs, body parts and surgical specimens or body parts removed during surgery or invasive procedures i.e. obstetrical, autopsy and laboratory procedures.
2. Contaminated animal parts/tissues, and carcasses.
3. Chemotherapy waste.

Contact the Chemical Safety Officer for disposal of infectious waste.  Infectious waste must be properly secured for collection by the Biohazard Waste contractor. "Properly secured" is defined as all biohazard (red or orange) bags tied, fastened or secured in the most efficient manner prior to removing the container from a work area.

All biohazard bags are to be kept in red Biohazard containers designated for infectious waste only.

These containers are supplied by the University’s infectious waste contractor.

Broken Glassware

Other wastes not covered in this guideline may require special handling or disposal as follows:

Pipettes, broken glassware, microscope slides, and cover slips not considered infectious under this guide should be regarded as injurious materials because they present a physical hazard to custodians when placed in the regular trash. Additionally, broken plastic vials, pipettes etc. are also defined as injurious and should be handled as such in the same manner indicated. These items should be boxed, sealed, and labeled "Broken glassware—disposal". Please ensure the box selected for transporting broken glass is suitable, sturdy and is taped completely closed. Boxes needed to ensure proper handling of broken glass and plastic can be ordered through Fisher Scientific (1-800-766-7000) or Lab Safety Supply (1-800-356-0783).

**Laboratory Waste Disposal Guide**

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|  | **Contaminated with:** (See definitions on the next page) |
| **Items** | **BiohazardA** | **Recombinant or Synthetic Nucleic Acid****(r/sNA)B** | **Other BiologicalC** | **ChemicalD** | **ChemotherapeuticE** |
| **(see all definitions from the above categories on the next page)** |
| **Regulated Sharps**Syringes with needles (For your safety **do not** remove needles from syringes unnecessarily)Scalpel bladesNeedlesGlass blood vialsGlass Pasteur pipettes | Sharps Disposal Container intoMedical Waste (MW) Bin | Sharps Disposal Container into MW Bin |
| **Other Sharps:**Broken serological pipettes, glass slides, cover slips, andglass vialsAny broken glasswareBroken plastic wareRazor blades | Sharps Disposal Container into MW Bin | Sharps Disposal Container into MW Bin--------OR--------Puncture Resistant Container**Autoclave** into Regular Trash | Puncture Resistant Container into Regular Trash | Sharps Disposal ContainerInto MW Bin |
| **Disposable Non-Sharps: 1**Serological pipettesMicropipette tipsSwabs, sticksGlass slides, coverslipsSyringes without needlesIntact glassware & plastic warePlastic petri dishes with agarGloves, disposable lab coatsBench paper and towels | Red Biohazard Bag with Puncture Resistant Container1 into MW Bin | Red Biohazard Bag into MW Bin--------OR--------Clear Bag**Autoclave**into Regular Trash | Clear Bag into Regular Trash | Red Biohazard Bag into MW Bin |
| **Plant Materials:**PlantsSeedsUsed potting mediaPlant cultures | Red Biohazard Bag into MW Bin | Red Biohazard Bag into MW Bin--------OR--------Clear Bag**Autoclave**into Regular Trash or Compost | Regular Trash or Compost | Consult hazardous waste manual or Contact Chemical Safety Officer | Red Biohazard Bag into MW Bin |
| **Carcasses and Tissues:**Animal carcasses2Animal and human tissuesHuman cadaver waste | Red Biohazard Bag into MW BinorDesignated Carcass Bin | Clear Bag into MWOrDesignated Carcass Bin | Consult hazardous waste manual or Contact Chemical Safety Officer | Red Biohazard Bag into MW Bin |
| **Liquid Waste**:Liquid media and cultures aspirated or decanted from flasks and dishesBody fluids*Solutions of biological toxins must be inactivated3* | Autoclave, then dispose of down the drain with a large volume of water | Consult hazardous waste manual or Contact Chemical Safety Officer |
| **Mixed Wastes:**Hazardous chemicals mixed with biohazard waste | Consult appropriate waste manual or Contact Chemical Safety Officer **before** generating such waste |

**Laboratory Waste Disposal Guide Definitions and Footnotes**

**Definitions of Contaminants:**

**A**. Contains or potentially contaminated with human infectious agents, viral vectors used with human and animal cell culture, biologically-derived toxins, human blood and body fluids, all human and animal cell cultures, or fluids and tissues from infected animals.

**B.** Recombinant or synthetic nucleic acids or genetically modified microorganisms (e.g., bacteria, plants, insects, and animals). If also infectious, refer to Biohazard column.

**C.** Not infectious to humans or animals, and non-r/sNA. Contains or potentially contaminated with environmental microorganisms, plant and insect pathogens, or plant tissue cultures. If contaminated with chemical residue, refer to “Chemical” column.

**D.** Disposable items contaminated with residual amounts of non-acutely toxic chemicals only (e.g., phenol, chloroform, acrylamide, xylene). For acutely toxic waste items, including the original containers from manufacturer, consult the Hazardous Waste Manual or contact Chemical Safety Officer. Ethidium bromide-contaminated waste must be deactivated or collected as chemical waste by the Chemical Safety Officer.

**E.** Disposable items contaminated with residual amounts of substances used to imitate a biochemical response in tissue culture or in animals and includes: antineoplastic agents (e.g., cisplatin, doxorubicin, cyclophosphamide); hormones or hormone-like drugs (e.g., estrogens, tamoxifen); synthetic analogs and other carcinogens (e.g., BrdU).

**Footnotes**

**1.** Non-glass biohazard items that can puncture bags (e.g., plastic pipettes, micropipette tips, swabs and sticks) may be placed in a puncture resistant container (e.g., cardboard box lined with biohazard plastic bag, biohazard labeled recycled plastic container) or manufactured “burn-up bin” and then finally packaged in a red biohazard bag for waste pick up. Serological pipettes can puncture bags when randomly mixed with other disposable items in plastic biohazard bags. Bundle the serological pipettes into a plastic sleeve conveniently placed inside the biohazard bag, which organizes them and prevents them from puncturing the outer red biohazard bag.

**2.** Separate carcasses and tissues from other disposable items (e.g., plastic and paper) whenever possible. Decant liquid away from carcasses, and dispose of the liquid appropriately (e.g., formalin and ethanol as chemical waste through the Chemical Safety Officer, buffer solutions as biohazard liquid waste).

**3.** Toxin Inactivation - below are commonly used inactivation procedures, though they may not be suitable for your particular toxin. Consult the product information sheet for your biological toxin for specific instructions on inactivation:

* Autoclave, if heat labile (steam at ≥121C for 1 hour, up to 1 liter volume), or
* Treat with NaOCl (sodium hypochlorite) at 1 – 2.5% (w/v) for 30 minutes (commercially available bleach solutions typically contain 3 – 6% (w/v) NaOCl, or
* Treat with NaOH (sodium hydroxide) at 1N for 30 minutes, or
* Treat with a combination of 0.25% NaOCl and 0.25N NaOH for 30 minutes, or
* Treat with another recognized inactivating solution.

Dispose of the inactivated toxin solution down the drain with a large volume of water. You must neutralize solutions with a pH outside the range 5.5 to 9.5 before disposal. Lastly, you can dispose of active biological toxins as chemical waste through the Chemical Safety Officer. Any further questions, contact Institutional Biosafety.