

# Waste Procedures and Information for Bio Labs

## Purpose and Introduction

- Note this document does not cover chemical or radioactive waste (see EPS website for more details)
- These procedures should be incorporated into your lab's standard operating procedures (SOPs) (general tissue culture, viral vector surgery, etc)
- All personnel must be trained on your lab's waste procedures and show proficiency in your lab's waste procedures
  - This training must be documented and kept for 5 years after the personnel have left the lab

## Key Contacts and Resources

### Environmental Protection Services | EPS

- Website: <https://ehs.utoronto.ca/our-services/environmental-protection-services/>
- Manual: <https://ehs.utoronto.ca/laboratory-hazardous-waste-management-and-disposal-manual/biological-waste-disposal/>
- Manager: Rob Provost 416-978-7000 | [rob.provost@utoronto.ca](mailto:rob.provost@utoronto.ca)
  - Contact the manager if you have any questions on hazardous material disposal/waste
- Environmental Protection Technicians (EPTs): 416-946-3473 | [eps.hazdisposal@utoronto.ca](mailto:eps.hazdisposal@utoronto.ca)
  - Contact the EPTs to set up a pickup service or request chemical/biological waste buckets

### Training on Hazardous Waste Management at U of T

- A short, optional, online course (EHS803) is available for U of T personnel
- <https://ehs.utoronto.ca/our-services/environmental-protection-services/eps-training-presentations/>

### Pathogen Safety Data Sheets

- <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment.html>

## Bleach Quick Facts

- The active ingredient in bleach is sodium hypochlorite
- Bleach stocks come in different concentrations of sodium hypochlorite (e.g., 3-12%)
- Lab members MUST know the concentration in their stock to be able to calculate the final dilution of sodium hypochlorite
- Lab SOPs should state the final dilution of sodium hypochlorite required for disinfection NOT the % of bleach (since bleach stocks are variable)
  - EXAMPLE → If your bleach stock is 6% and you need a 1% sodium hypochlorite solution (dilution often used for spills), then add 100 mL of your 6% bleach stock to 500 mL of liquid
- Diluted bleach breaks down very quickly and must be remade fresh every 24 hours

### Safety Precautions

- Bleach is very corrosive
  - If using a sodium hypochlorite solution of 0.5% or higher, then rinse the surface after the required contact time
- Bleach must never be autoclaved → it can cause hazardous chlorine gas to be released!

# Waste Disposal Guidelines

## Note:

- 1) the procedures outlined below may need to be modified, for example, if biological waste is also contaminated with chemicals or radioisotopes.
- 2) Certain departments or units may not have autoclaves dedicated for RG1 waste treatment, in this case, consult your HSO



## Risk Group 1 Waste

### Liquid

- Pour bleach stock into the solution so that the final concentration is 1% sodium hypochlorite, let sit for 30 minutes, then pour down the sink
- You can use a different disinfectant and contact time as long as you validate the efficacy of this procedure (it decontaminates your bioagent)
- **Or** autoclave at 121°C for at least 20 minutes and once cooled dispose by pouring down sink. Do not autoclave bleach

### Solid

- Autoclave at 121°C in autoclave bags without the biohazard symbol for at least 20 minutes and then dispose in regular garbage
- Note that bags with the international biohazard symbol can NOT be disposed of in the regular garbage. You must use bags without the symbol



## Risk Group 2 Waste

### Liquid

- Pour bleach stock into the solution so that the final concentration is 1% sodium hypochlorite, let sit for 30 minutes, then pour down the sink
- You can use a different disinfectant and contact time as long as you validate the efficacy of this procedure (it decontaminates your bioagent)
- Appropriate decontamination procedures can be obtained from product information sheets, Pathogen Safety Data Sheets (PSDS), etc
- Ensure that the appropriate contact time and dilution of the active ingredient (e.g., sodium hypochlorite in bleach) is used to completely decontaminate liquid waste

### Solid

- Place waste in yellow biohazard bags/lined buckets provided by EPS



## Viral Vectors and Aerosolisable Bioagents

- There could be delayed complications with exposure to these agents so they require more stringent waste procedures
- All contaminated material must be fully decontaminated **inside the biosafety cabinet (BSC)**
- Includes: pipette tips, tubes, flasks, plates, solutions, etc
- Use the appropriate disinfectant and contact time for your bioagent
  - E.g., sodium hypochlorite, accelerated hydrogen peroxide, etc

### Solid

- Contact time with the disinfectant needs to be min 30 minutes
- Then pour off the disinfectant into the sink
- The remaining solid waste goes into the yellow biohazard bags/buckets supplied by EPS

**Liquid** → follow the same procedures as liquid Risk Group 2 waste

- Check the PSDS, product sheet, or consult your HSO if you are unsure which disinfectant to use and the contact time

	<b>Sharps</b>	<ul style="list-style-type: none"> <li>• Examples: needles, needles with syringes, scalpels, blades, glass transfer pipettes, glass capillary tubes, etc</li> <li>• Dispose in approved needle and blade waste container that complies with CSA standard Z316.6-14.</li> <li>• Sharps contaminated with viable biological material and trace amounts of hazardous chemicals can be collected together</li> <li>• When full, close the lid and keep for pickup by EPS</li> <li>• For further information see: <a href="https://ehs.utoronto.ca/our-services/biosafety/biosafety-manual/needles-and-syringes/">https://ehs.utoronto.ca/our-services/biosafety/biosafety-manual/needles-and-syringes/</a></li> </ul>
	<b>DNA Staining Reagents</b>	<ul style="list-style-type: none"> <li>• Examples: ethidium bromide, Redsafe, Sybr safe, etc</li> <li>• Includes: running buffers, gels, pipette tips, etc</li> <li>• Dispose of in green chemical waste buckets supplied by EPS</li> <li>• Do not dispose of liquid waste down the drain! <ul style="list-style-type: none"> <li>○ Local municipal by-laws do not allow for disposal down drains</li> </ul> </li> </ul>
	<b>Toxins and Human Tissues</b>	<ul style="list-style-type: none"> <li>• Examples: human anatomical waste, cholera toxin, contaminated disposable lab ware, etc</li> <li>• Some toxins (e.g., cholera toxin) require incineration. Use the designated incineration waste buckets supplied by EPS</li> <li>• Human tissues should be return to the facility they were acquired through</li> <li>• Contact the Manager of EPS for approval of waste methods</li> </ul>
	<b>Animal Tissues</b>	<ul style="list-style-type: none"> <li>• Return to the animal facility for incineration</li> <li>• Contact your animal facility for instructions and waste containers</li> </ul>
	<b>Plant Pathogens and Pests</b>	<ul style="list-style-type: none"> <li>• Plant pathogens/pests listed by the Canadian Food Inspection Agency (CFIA) and any contaminated material such as plants, soil, pots.</li> <li>• For a list of regulated plant pests see: <a href="http://www.inspection.gc.ca/plants/plant-pests-invasive-species/pests/regulated-pests/eng/1363317115207/1363317187811">http://www.inspection.gc.ca/plants/plant-pests-invasive-species/pests/regulated-pests/eng/1363317115207/1363317187811</a></li> <li>• Must dispose as Risk Group 2 waste</li> <li>• Contact EPS for instructions and waste containers</li> </ul>
	<b>Genetically Modified Organisms (GMOs)</b>	<ul style="list-style-type: none"> <li>• Examples: genetically modified invertebrates, vertebrates, plants, their products (i.e., germ cells-pollen, spores, etc), etc</li> <li>• Ensure that the GMOs are no longer viable before disposing of them</li> <li>• There must be NO release into the environment</li> <li>• Discuss the waste procedure with your Health and Safety Officer</li> <li>• A risk assessment must be performed by the investigator</li> </ul>
	<b>Non-Native Species</b>	<ul style="list-style-type: none"> <li>• Examples: non-native invertebrates, vertebrates, plants, their products, etc</li> <li>• They must NOT be released into the environment.</li> <li>• Discuss the waste procedure with your Health and Safety Officer</li> <li>• A risk assessment must be performed by the investigator</li> </ul>



## Soil

- All untreated soil that is foreign (from any other country) and from regulated areas in Canada must be sterilized prior to disposal
- See CFIA directive D-95-26 for more information and approved sterilization methods <http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/date/d-95-26/eng/1322520617862/1322525442569#a15d>



## All Other Waste

- Examples: chemical waste, radioisotopes, mixed waste
- Discuss your waste procedures with EPS

### Version History

Waste Procedures for Bio Labs		
Vers.	Date	Changes
3.0	April 8, 2019	Document created by UofT Biosafety Office with EPS review
3.1	Sept 14, 2020	Addition of Bleach information, Addition of EPS contact information, formatting update
3.2	June 16, 2022	Addition of needle and sharps waste procedures, minor revisions of document in consultation with EPS Manager