



Standard Operating Procedure Working With Toxins

Standard Laboratory Practices

- Access to the laboratory is limited or restricted at the discretion of the laboratory director.
- Placards should be placed on the entrances to the lab listing biological hazards and the PI's name and 24/7 contact information for the PI and/or laboratory personnel familiar with the biohazard.
- In addition, when performing work with toxins, access to the room should be restricted and a sign stating the following should be placed on the door: "Toxins in Use—Authorized Personnel Only."
- Do not store food in lab.
- Do not eat, drink, smoke, handle contact lenses, apply cosmetics (including chap stick), etc. in the lab.
- Do not mouth pipette.
- Plants or animals not involved in experiments are not allowed in the lab.
- Vacuum lines must be HEPA filtered
- Liquids should be handled carefully to minimize creation of splashes and aerosols. Centrifugation should be performed using sealed tubes and sealed rotors or safety cups.
- Sharps should be handled with extreme caution to avoid cuts or autoinoculation during use and disposal. Needles should not be bent, sheared, or recapped. The needle and syringe should be promptly placed in a puncture-resistant container and decontaminated by autoclaving.
- Transport: Toxin must be transported in a sealed primary container inside a sealed durable and leak proof secondary container that has been labeled with a warning label.
- Lab personnel must wash their hands after they handle the toxin and or animals injected with toxin, after removing gloves, and before leaving the laboratory or animal facility.
- Laboratory personnel must be appropriately trained.
- The safety protocol (SOP) serves as training documentation and reference information. A copy signed by laboratory personnel should be stored in the lab's safety manual.
- Toxins shall be handled with appropriate precautions consisting primarily of **good microbiological laboratory techniques** as well as Biosafety Level 2 (BSL-2) containment.

Personal Protective Equipment (PPE)

- Wear protective gear including disposable gloves (double gloves recommended) and a dedicated cloth or disposable lab coat. Ensure gloves are compatible with any solvent your toxin may be dissolved in.
- Wear safety glasses and face protection when not working in a fume hood or biosafety cabinet.
- Dispose of contaminated PPE in biohazard bags/containers.
- No personal protective equipment shall be worn outside of the lab.

Working Procedures

- **Before working with toxin:**
 - If applicable, prepare inactivating agent in appropriate containers for disinfecting supplies that may come in contact with the toxin.
 - Put on PPE
- **Working with toxin**
 - If at all possible, avoid working with lyophilized toxin (i.e. weighing of toxin, etc). Ideally, the toxin is purchased in solution. If you must weigh a toxin, then the scale must be located in a certified chemical fume hood.
 - If the toxin is in lyophilized form, resuspension should also occur in a certified chemical fume hood.
- **Sharps use**
 - Some toxins come in glass ampules that must be “snapped” to have access to the powder within for resuspension. Use great care in cracking the ampule to avoid an accidental cut.
 - Some toxins arrive in rubber septum sealed vials. If using a needle and syringe to plunge through the septum to resuspend, then use a hands-free device to stabilize the vial to avoid an accidental needle stick.
 - Whenever possible, use needle-free techniques to re-suspend toxins
 - Use a biological safety cabinet (BSC) for resuspension of biological toxins or manipulation of stock concentrations that can create aerosols, such as pipetting, harvesting or infecting cells, filling tubes and containers, and opening sealed centrifuge containers. Aerosol resistant tips must be used when pipetting.
 - Immediately replace gloves, if contamination is suspected.
- **After working with toxin:**
 - **Toxins should NEVER be disposed of without prior inactivation.**
 - Toxin stability varies considerably outside of physiological conditions depending on the temperature, ionic strength, pH, and other characteristics. Inactivation is not always linear with function of heating time and some protein toxins possess the ability to re-fold and partially reverse inactivation caused by heating. In addition, the conditions for denaturizing toxins in aqueous solutions are not necessarily applicable for inactivating dry, powdered preparations.
 - Materials that are potentially contaminated with toxins shall be disposed of as biohazardous waste and sharps must be placed into a red sharps container marked as biohazardous waste.

Spill Procedures

- Notify workers in the area.
- Leave the area for 15 minutes to allow aerosols to settle. Replace contaminated PPE.
- Upon return, decontaminate the area with an appropriate inactivating agent
- Allow appropriate contact time for inactivation.
- Absorb spill with paper towels and dispose them into biohazard bags.
- Use dustpan and broom to sweep up debris. Broken glass must be deposited into broken glass or sharps box.
- Wipe the spill area clean using appropriate inactivating agent.
- Dispose of contaminated PPE in autoclavable biohazard bags.