SAFETY INFORMATION FOR TOXINS OF BIOLOGICAL ORIGIN (SELECT AGENT TOXINS)

Toxins are defined as any toxic substance of natural origin produced by an animal, plant, or microbe. They are non-volatile, usually not dermally active (mycotoxins are an exception), and tend to be more toxic per weight than many chemical agents.

The possession, use, and transfer of certain toxins of biological origin are regulated by the federal government. These regulated toxins have been deemed by the federal government as a significant risk to the human, livestock, and crop welfare and are called Select Agent Toxins. A complete list of the Select Agent Toxins is maintained by the Centers for Disease Control and Prevention at http://www.cdc.gov/od/sap/docs/salist.pdf .

If you possess or anticipate a need for a Select Agent Toxins, you are required to notify the Laboratory Safety Unit of EH&S immediately. Registration with the federal government is required above a specific quantity threshold. Since the registration process is lengthy, the Laboratory Safety Unit must be consulted at least 3-6 months prior to the anticipated need. Please refer to http://www.safety.rochester.edu/ibc/SAResource.html for additional information.

There are many other toxins of biological origin that while hazardous to the individual using them do not present the same public health implications as the select agent toxins. Examples of these non-regulated toxins include diptheria toxin and pertussis toxin.

General Use of Toxins

The information furnished below is a general guideline that can assist researchers in establishing standard operating procedures (SOP) for the use of toxins of biological origin. SOPs for non-exempt amounts of select agent toxins are subject to institutional approval. Additional information for the use, storage, disposal, and security of toxins of biological origin is available through the University of Rochester Select Agents Program and the most current edition of the CDC/NIH "Biosafety in Microbiological and Biomedical Laboratories".

Laboratories possessing a non-exempt amount of a select agent toxin must also develop a site-specific security plan to comply with the University's Select Agents Program. This site-specific security plan is subject to institutional approval.

Securing of gas cylinders

Not applicable.

Decontamination procedures

Personnel: Remove gloves. Wash hands and arms with soap and water immediately after handling toxins. Remove any jewelry to facilitate the removal of toxins. Seek medical attention following any exposure or potential exposure.

Area: Decontamination procedures vary depending on the material being handled. The toxicity of some materials can be neutralized with other reagents. All surfaces should be wiped with the appropriate cleaning/neutralization agent. Waste materials generated should be treated as a hazardous waste.

Equipment: Decontaminate vacuum pumps or other contaminated equipment (glassware) before removing them from the designated area.

Designated area

All locations within the laboratory where toxins are handled should be posted with caution signs. This includes all fume hoods and bench tops. The signs must include the words "TOXIN IN USE – AUTHORIZED PERSONNEL ONLY".

Where feasible toxins should be manipulated over plastic-backed disposable paper work surfaces. These disposable work surfaces minimize work area contamination and simplify clean up.

Emergency procedure

Emergency procedures address response actions to fires, explosions, spills, or injury to staff. Utilize the information available in the "Emergency 13" flip chart. The following emergency phone numbers should be utilized to initiate an emergency response:

All emergencies:	x13 (Public Safety)
Chemical Exposures:	x5-4955 (UHS)
Laboratory Safety Unit	x5-2402
Occupational Safety Unit:	x5-3241
Environmental Compliance/Hazardous Waste	x5-2056
Radiation Safety Unit:	x5-3781

Eye Protection

Eye protection in the form of safety glasses or goggles must be worn at all times when handling toxins. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses may not pass the rigorous tests for industrial safety glasses.) Adequate safety glasses must meet the requirements of the most recent edition of Practice for Occupational and Educational Eye and Face Protection (ANSI Z.87.1) and must be equipped with side shields. Safety glasses with side shields do not provide adequate protection from splashes, therefore, when the potential for splash hazard exists other eye protection and/or face protection must be worn. Users can elect to wear goggles or a face shield instead of safety glasses if deemed possible through the hazard risk assessment.

Eyewash

Where the eyes of any person may be exposed to toxins, suitable facilities for quick drenching or flushing of the eyes shall be provided within 50 feet for immediate emergency use. Bottle type eyewash stations are not acceptable.

Fume hood

Manipulation of toxins shall be carried out in a fume hood. If the use of a fume hood proves impractical refer to the section on special ventilation.

Glove (dry) box

Some toxins may need to be handled in a glove box rather than a fume hood. The Laboratory Safety Unit or the Principal Investigator will determine if this is required.

Gloves

Gloves must be worn when handling toxins. Many chemicals may permeate gloves in a short period of time. The selection of the proper glove material should be made according to the MSDS and the recommendations of the glove manufacturer.

Security Risk Assessment

Select agent toxins (exempt and non-exempt) are subject to security risk assessments per the University of Rochester's Select Agents Program. Site-specific security plans must comply with the University's Select Agent Program and are subject to institutional approval.

EH&S Notification

You **must** notify the Laboratory Safety Unit of EH&S prior to ordering Select Agent Toxins. Notification is also required for proposed changes in procedures or the quantity of Select Agent Toxins possessed.

The purchase of non-select agent toxins does not require prior notification to the Laboratory Safety Unit.

Clothing & Protective Apparel

To prevent dermal exposure to these chemicals: A layer of clothing will help prevent splash and droplet exposures. Personnel should wear a long sleeve shirt and pants. A lab coat can is also recommended. Personnel should wear non-skid sole shoes. The following types of shoes are not recommended: open-toes shoes, open heeled shoes, shoes made with cotton or a material that readily absorbs liquids.

Safety shielding

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of toxins which pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants, are acceptable.

Safety shower

A safety or drench shower should be available within 100 feet where toxins are used. The path to the shower must be clear and unobstructed.

Signs and labels

All toxins be clearly labeled with the correct chemical name and hazard warnings. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Special storage

Toxins must be stored in a locked storage cabinet/refrigerator within a secure laboratory. They must never be stored in a corridor, a non-secured equipment room, or any other non-secured location. Other

requirements may apply to Select Agent Toxins per the University of Rochester's Select Agents Program.

Special ventilation

Manipulation of toxins outside of a fume hood may require special ventilation controls in order to minimize exposure to the material. Fume hoods provide the best protection against exposure to toxins in the laboratory and are the preferred ventilation control device. If the use of a fume hood proves impractical attempt to work in a glove box or in an isolated area on the laboratory bench top.

If available, consider using a Biological Safety Cabinet (BSC). The BSC is designed to remove those toxins that are in particulate form before the air is discharged into the environment.

All areas where toxins are stored or manipulated must be labeled as a designated area.

Spill response

The appropriate clean up equipment must be available and a written protocol must be established prior to the use of a toxin. The appropriate clean up supplies can be determined by consulting the safety data sheet and EH&S.

In the event of a spill alert personnel in the area that a spill has occurred. Do not attempt to handle a large spill of a toxin. Vacate the laboratory immediately and call Public Safety (x13) from a safe location for a spill response. Remain on the scene, but at a safe distance, to receive and provide information to safety personnel when they arrive.

Vacuum protection

Evacuated glassware can implode and eject flying glass, and splattered chemicals. Such glassware should be wrapped or taped to minimize potential flying glass from an implosion involving vacuum work. Vacuum work involving toxins must be conducted in a fume hood, glove box or isolated in an acceptable manner.

Mechanical vacuum pumps must be protected using cold traps and, where appropriate, filtered to prevent particulate release. The exhaust for the pumps must be vented into an exhaust hood.

Waste disposal

All materials contaminated with toxins must be properly decontaminated. Destroy on site by autoclaving, incineration, or other recognized sterilization or neutralization process. Questions regarding disposal processes must be directed to the Laboratory Safety Unit (x5-2402). This office can also assist you in minimizing waste generation.