BIOLOGICALLY-DERIVED SUBSTANCES (BDS)

(*non-living and not infectious powders, suspensions, solutions*)
(certain **toxins**[1] may require a lab-specific SOP

Hazards	**Risks**	• Acutely toxic BDS can cause systemic toxicity or death if ingested, inhaled, percutaneous, mucous membrane exposure. Examples include: TOXOID/VACCINE, TOXIN, PEPTIDES, and ANTIBODIES. • Other health hazards (e.g., oncogenic/mutagenic, reproductive effects, respiratory sensitization, and organ damage) and/or irritation of the eyes, skin, or respiratory system could occur. • Some BDS are suspended in chemicals that have physical or health hazards (not covered by these guidelines). See Chemical Guidelines. • See chemical Safety Data Sheet (SDS)/Product Information Sheet for specific hazard information.
Hazard Controls	**Medical Screening**	• Some **toxins** (discuss this with OESO) have acute affects requiring medical review (and/or vaccination or titer) through Employee Occupational Health and Wellness (EOHW) (919-684-3136), Duke Clinic in the sub-basement of the Orange Zone (Room 0320). All personnel have the opportunity to discuss occupational concerns with a medical provider.
	Selection & Purchase	• Purchase the smallest practical amount. • When possible, order material in liquid form **OR** in pre-weighed amounts, in a sealed septum-top vial so that diluent can be injected directly into the vial.
	Storage & Transport	• Use a sealed, leak/sift-proof container, lined with absorbent (for liquids) to transport materials. • Keep BDS away from any incompatible materials.
	Engineering Controls	• Use a **chemical fume hood (CFH) or Class II biological safety cabinet (BSC)** when diluting concentrated and highly toxic BDS (stocks) **AND** if exposure to hazardous aerosols could occur. • Use a **CFH** or **exhausted BSC** (directly vented to the outside) if exposure to hazardous vapors or gases could occur.
	Work Practice Controls	• Line CFH/BSC work surface with absorbent, leak-proof bench pads. • Use safer alternatives (safer sharps devices). See SHARPS MANAGEMENT PLAN. • Inject diluent through septum-top and immediately dispose of syringe with attached needles into a sharps container located within arm's reach. • If absolutely necessary to weigh BDS, place balance in CFH **or**: o Tare (pre-weigh) an empty container with a lid. o Go to CFH; add powder to container, close lid before weighing. o Return to CFH to before opening lid for other manipulations. • Use an anti-static gun if powder sticks to sides of vial, etc. • Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption are not permitted in laboratory areas. Food is stored outside the laboratory area.
	Personal Protective Equipment (PPE)	• Lab coat (or gown/tyvek, etc.) and gloves required. Mucous membrane protection (e.g. safety glasses or face shield) must be used if there's a potential for splash or spray such as when opening tube and cleaning up spills. • If SDS indicates **"fatal in contact with skin"**, wear two pairs of nitrile gloves*. *Check the manufacturer's glove guide for glove effectiveness with any solvents you are using. • Change gloves immediately, if contaminated. • Remove PPE and WASH HANDS prior to leaving the work area.
Other	**Cleaning & Decontamination**	• Decontaminate the work area using a compatible solvent/inactivating solution.
	Waste	• **See lab-specific chemical hygiene plan, Lab Chemical Waste Management Practice, and Drain Disposal Practice.** • **Solid disposal items:** o **If autoclaving:** Place in an autoclavable bag. Close loosely to allow for steam penetration. Place bag in a secondary autoclavable tray/open bin (to prevent or contain leaks) and **autoclave for 90 minutes at 121 degrees Celsius, 15 p.s.i.** Allow to cool. Place in leak-proof container and transport to the building dumpster. **Do not autoclave flammable or corrosive chemicals.** *See Autoclave Training*. o **If not autoclaving:** Follow Lab Chemical Waste Mgt Practice (linked above) for chemical waste. • **Sharps:** Activate safety device (if available) and place immediately in puncture resistant sharps container (needle box); close when container is two-thirds filled or sooner. **DO NOT** attempt to jam used needles into a full container. Follow solid disposal guidelines.
	Emergencies	• See Emergency Response webpage or flip chart and/or lab specific chemical hygiene plan.
	Spills	• Wear full PPE, including a lab coat, disposable gloves, and full-face protection. • Pick up sharp items with mechanical device and place into sharps container. • Decontaminate the work area using a compatible solvent/inactivating solution. • Refer to the **Emergency Response Guide** and lab-specific chemical hygiene plan/SOP (if applicable) in your work area for more information.
	Exposures	• Remove contaminated clothing and wash skin with soap and water for 1 minute. • For eye exposures, flood eyes with water from emergency eyewash station for 15 minutes. • Obtain medical attention, if necessary and **report** to EOHW by dialing the Occupational Exposure Hotline at 919-684-8115. • Complete the "Report a Work-Related Accident, Injury, or Illness" form at linked hr.duke.edu page.
	Training	• Complete minimum safety training requirements for your job. • Review/sign **toxin-specific SOP, if applicable**. All personnel shall read and fully adhere to all SOPs.
	Questions	Contact OESO - Biological Safety Division at 919-684-8822 or biosafety@duke.edu

[1]See non-select toxins: https://www.safety.duke.edu/biological-safety/biological-materials/non-select-toxins

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