DivisionOf Public Safety

**ENVIRONMENTAL HEALTH AND SAFETY**

**LAB-SPECIFIC BIOSAFETY MANUAL**



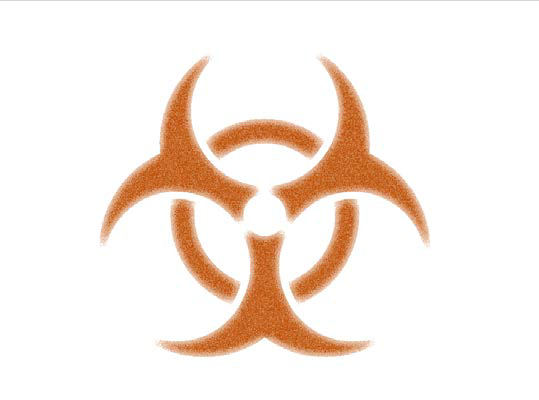


LAB-***SPECIFIC*** Biosafety Manual

**for the** **Laboratory**

**Updated on:**

**IBC Protocol Number:**



## **SIGNATURE PAGE for Principal Investigators and Designees**

**PIs or their designees must electronically complete the *Lab-Specific Biosafety Manual (LSBM)* template. PI**

**signatures are required on the completed document.**

**A designee can be assigned the task of completing the LSBM by the PI of the research program. Designees must be persons of competence, proficiency and responsibility in the PI’s research program (post-doctoral student or fellow, doctoral student, lab technician, research associate, etc.). If a designee completes this template, the PI must review it for correctness prior to providing a signature. Designee signatures are also required on the completed document.**

**Upon providing your signature below when this document is complete, as PRINCIPAL INVESTIGATOR you are verifying:**

• **Accuracy, currency and correctness of the content, to the best of your knowledge.**

• **Your agreement with and compliance with the conditions and requirements set forth in the**

**document, item by item, and as denoted by placing a ‘check’ in check boxes provided with items.**

• **Your understanding that you will be held accountable if these conditions and requirements are not met.**

• **Your review and approval of the content in the document as provided by your designee (if applicable).**

**Principal Investigator(s)**

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| **PRINT NAME** | **SIGN NAME** | **DATE** |
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**Upon providing your signature below when this document is complete, as DESIGNEE for your Principal**

**Investigator you are verifying:**

• **Accuracy, currency and correctness of the content you provided, to the best of your knowledge.**

• **Your agreement with and compliance with the conditions and requirements set forth in the**

**document, item by item, and as denoted by placing a ‘check’ in check boxes provided with items.**

**Designee(s)**

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| **PRINT NAME** | **SIGN NAME** | **DATE** |
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## **SIGNATURE PAGE for Lab Workers**

**(Copy/ print this 2-sided page (iii, iv) to accommodate signatures as needed.)**

**The online University Biosafety Manual *and* your Lab-Specific Biosafety Manual must be read before beginning work in this laboratory.**

**Please acknowledge, by printing and signing your name below, 1) you have read these documents and 2) you will follow their policies, practices and procedures.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DATE** | **PRINT NAME** | **SIGN NAME** | **BEGAN WORK**  **IN LAB ON:** | **ENDED WORK**  **IN LAB ON:** |
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## **SIGNATURE PAGE**

**The online University Biosafety Manual *and* your Lab-Specific Biosafety Manual must be read before beginning work in this laboratory.**

**Please acknowledge, by printing and signing your name below, 1) you have read these documents and 2) you will follow their policies, practices and procedures.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DATE** | **PRINT NAME** | **SIGN NAME** | **BEGAN WORK**  **IN LAB ON:** | **ENDED WORK**  **IN LAB ON:** |
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## **PURPOSE OF THE LAB-SPECIFIC BIOSAFETY MANUAL (LSBM) TEMPLATE**

Completion of this document provides your lab staff with 1) a comprehensive summary of operations for your biological research lab, and 2) an occupational risk assessment for your work with biohazardous materials.

Maintenance of a printed copy of this completed document in the lab is required for reference, training and emergency response. The completed document is also essential for IBC review of your protocol for approval/

renewals, and for biosafety inspections by EHS.

## **COMPLETING THE LSBM TEMPLATE**

**For Principal Investigators (and their designees, if applicable):**

1. Read the **online *University Biosafety Manual*** before completing the LSBM.

2. In this LSBM template, please provide information that is specific to your lab by electronically completing **fillable text areas** and filling relevant **checkboxes** in Sections 1-19. Do not attempt to place

material in the Appendices.

3. Submit the document with completed Sections 1-19 to the IBC; this is a required component of your protocol submission to the IBC. In Appendices A, B, C, D and E, place materials you have submitted with your protocol, per instructions given on each Appendix title page.

4. **Once it has been reviewed and approved by the IBC, print a copy of your LSBM to keep in your lab.**

## **USING AND MAINTAINING THE LSBM**

1. **REQUIRED FOR LAB-SPECIFIC TRAINING: All laboratory personnel must read 1) the online *University Biosafety Manual,* and 2) the printed copy of your laboratory’s completed LSBM BEFORE ACTIVELY WORKING WITH BIOHAZARDOUS MATERIALS IN THE LABORATORY. ALL LABORATORY PERSONNEL MUST VERIFY THAT THEY HAVE READ THESE DOCUMENTS BY SIGNING THE SIGNATURE PAGE OF THE LSBM.**

2. **Update the LSBM when anything changes such as personnel, agents, procedures, equipment, work locations, etc. Document all updates on the *Manual Review/ Revision Status* page (page vi), and print the necessary updated pages to include in your printed LSBSM.**

3. **The LSBM must be reviewed annually by PI or designee. Document your annual reviews on the**

***Manual Review/Revision Status* page.**

## **TRAINING RECORDS TO BE KEPT IN YOUR LSBM PRINTED COPY**

**Training Forms:**

1. [**Biosafety Training Record for New Personnel**](https://www.ehss.vt.edu/detail_pages/document_details.php?category_id=18&document_id=565)

**(Required training documentation for all lab workers; use to record receipt of lab-specific training for new personnel, and to document training/proficiency status of existing personnel.)**

1. [**Lab Topics Training Record**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=3&document_id=567)

**(Use as needed to record receipt of training on new topics for existing lab personnel.)**

1. [**Biohazard Awareness Training Record**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=2&document_id=566)
2. **(Use as needed to record receipt of awareness training for 1) personnel using shared spaces/ equipment, or 2) for those working in the lab who do not handle biohazards.)**
3. [**Proficiency Checklist for Lab Personnel**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=3&document_id=568)

**(Use as needed to evaluate and document proficiency after remedial or higher level training.)**

* **YOU CAN ACCESS TEMPLATES FOR THESE TRAINING DOCUMENTS BY CLICKING ON THE NAME OF EACH DOCUMENT LISTED ABOVE, OR**
* **YOU CAN FIND LINKS AND PRINTED COPIES FOR EACH DOCUMENT (FOR PHOTOCOPYING) IN APPENDIX H.**
* **IN APPENDIX H OF THE LSBM, KEEP COMPLETED *BIOSAFETY TRAINING RECORD FOR NEW PERSONNEL* SHEETS (PRINTED PAGES) FOR EACH PERSON WORKING IN THE LAB.**
* **ALSO IN APPENDIX H, KEEP ANY OTHER COMPLETED BIOSAFETY TRAINING DOCUMENTS YOU MAY GENERATE.**

## **MANUAL REVIEW / REVISION STATUS**

|  |  |  |  |
| --- | --- | --- | --- |
| **DATE** | **Revision #** | **Comments** | **Signature** |
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## **1. EMERGENCY CONTACTS**

|  |  |  |
| --- | --- | --- |
| **NAME** | **WORK TELEPHONE** | **CELL TELEPHONE** |
| ***Principal Investigator*** |  |  |
| ***Lab Manager*** |  |  |
| ***Second Lab Contact*** |  |  |
| ***Building Manager*** |  |  |
| Charlotte Waggoner  Anna Kroner Michael Miles  Allison Price  ***Biosafety Officers*** | **540-231-5864**  **540-231-1122**  **540-231-3361**  **540-231-8223** | **540-320-5864**  **540-525-8574**  **217-377-4610** |

|  |  |  |
| --- | --- | --- |
| **EMERGENCY TELEPHONE NUMBERS** | **8 am - 5 pm** | **After 5 pm,**  **Weekends** |
| **Virginia Tech EHS Main Office**  **National Children’s Hospital EHS** | **540-231-3600**  **202-545-2702** | **911\*** |
| **Hazardous Material Safety**  **Virginia Tech**  **National Children’s Hospital** | **540-231-2982/8758, 540-320-4754**  **202-545-2702** |
| **Radiation Safety** | **540-231-5364, 540-320-8305** |
| **Police/Rescue** | **911\*** |
| **Fire Department** |

**\* If using a cell phone to dial 911, remember to identify your location for the operator.**

• **OFF-CAMPUS SITES SHOULD USE 911 FOR LOCAL EMERGENY RESPONSE.**

• **Use the non-emergency VT Police number, (540) 382-4343, for information and to**

**contact VT support personnel as needed.**

• **Use the non-emergency National’s Children’s Hospital Police number, (202) 715-7400, for information and to contact support personnel as needed.**

## **2. INCIDENT / ACCIDENT REPORTING**

*Copy this section and place it near your lab’s telephone.*

1. As soon as any initial response is complete and the incident is stable, ***immediately notify:***

a. The Lab Director and/or Lab Manager

b. The Animal Facility Manager/ Greenhouse Manager (if applicable)

c. A Biosafety Officer (BSO) by telephone (preferred) or email.

2. The BSO will acknowledge receipt of notification by communicating to the reporting person via phone or email, and will begin notifying other appropriate personnel and/or agencies.

3. **IMPORTANT:** If the incident involves a known exposure to recombinant material (e.g., rDNA/ synthetic nucleic acids/ transgenic or genetically modified organisms), the BSO must immediately inform NIH.

4. The reporting person and the supervisor of the facility (e.g., Lab Director/ Lab Manager/ Animal Facility Manage/ Greenhouse Manager) must complete a [**VT Lab Incident Report**](http://www.ehss.vt.edu/detail_pages/document_details.php?category_id=18&document_id=320) and submit it to the BSO via email (preferred) or campus mail (MS 0423) **as soon as possible**.

5. BSO will acknowledge receipt of this report via email.

6. **If an injury or exposure has occurred**, an [**Employer’s Accident Report**](https://www.hr.vt.edu/benefits/workers-compensation.html)must be completed immediately by the supervisor per directions found on the link webpage.

7. If the supervisor does not complete the report in a timely manner, injured/exposed individuals are encouraged to complete the Employer’s Accident Report themselves.

|  |  |  |
| --- | --- | --- |
| **Biosafety Officers** | **Telephone** | **Email** |
| Charlotte Waggoner | 540-320-5864 | [ren@vt.edu](mailto:ren@vt.edu) |
| Anna Kroner | 540-525-8574 | [akroner@vt.edu](mailto:akroner@vt.edu) |
| Michael Miles | 217-377-4610 | [msmiles@vt.edu](mailto:msmiles@vt.edu) |

**a. NOTE: If a Biosafety Officer does not acknowledge receipt of notification within two (2) hours, notify another Biosafety Officer.**

b. If email is not available, the UBO/ABO will acknowledge receipt via phone call to the reporting person and other appropriate personnel.

## **3. EMERGENCY INFORMATION**

### **3.1 Posting Of Emergency Contacts And Hazards**

We have posted an [**Emergency Contacts sign**](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=emergency+contact&document_id=520) on the access doors to all areas where

potentially infectious material is used or stored (including refrigerators, freezers or

cryogenic storage units). Emergency contact sheets is accurate and kept current. They

include:

• Names of Principal Investigators, Lab Managers and/or other responsible personnel; a

MINIMUM of 2 names for responsible parties is provided.

• Telephone numbers for these individuals where they can be reached at any time.

We have placed **a** [**Biosafety level sign**](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=biohazard+sign&document_id=178) **and warning signs for other hazards** present in the

laboratory on the main access doors to the lab.

### **3.2 Safety Equipment Locations**

|  |  |
| --- | --- |
| **Safety Equipment** | **Nearest Location in/ to Your Work Area**  **(List Rm # and briefly describe location in room, i.e., “At lab sink,” or “On wall by**  **main lab entry,” etc.)** |
| Eyewash Stations |  |
|  |  |
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| Emergency Showers or Drench Hoses |  |
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| Fire Extinguishers |  |
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| Fire Alarm Pull Stations |  |
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| Handwashing Facilities (water, or sanitizer) |  |
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| Biological Spill Kit    (Contents of spill kit: Disposable lab coat/ gloves/ shoe covers/ disposable face shield; absorbent paper towels; dustpan; tongs/ forceps; autoclave bags; disinfectant; copy of spill procedure; warning sign for spill to post; N95 respirator if appropriate) |  |

### **3.3 Specific Procedure To Be Used In This Laboratory For BIOHAZARD SPILL RESPONSE**

**Disinfectant and Final Working Concentration** **or Dilution Used for Spills** (e.g., bleach, 1:5 dilution ):

**Absorbent Material Used for Cleaning Up Spills:**

**Spill Response Steps To Take:**

### **3.4 Other Cautions/ Hazards To Address In This Lab In The Event Of A BIOHAZARD SPILL**

## **4. SECURITY OF LABORATORIES AND BIOLOGICAL MATERIAL**

|  |  |
| --- | --- |
|  | This lab will practice the policy of **closing access doors** to biohazardous work areas when work is being performed with biohazardous materials. |
|  | Entry doors to the biohazardous area **will be locked** when no one is in the lab for an extended period of time, e.g., at night, weekends, holidays, etc. |
|  | Activities and equipment used with potentially biohazardous materials **will be located only in areas approved for that work**, and will have biohazard signage posted as appropriate. |
|  | If biohazardous material is stored in freezers, refrigerators, dewars, etc. that are located in areas accessible to the public (such as a hallway or corridor that does not have restricted access), **those storage units will be 1) kept locked except when lab personnel are removing or adding material, or 2) maintained in those locations using the following security measures:** |

## **5. VISITOR ACCESS**

Visitors to this lab **will be:**

• authorized by the PI or designee,

• escorted by lab personnel, and

• informed of necessary lab safety and lab hazards information prior to entering the lab.

## **6. SERVICE PROVIDERS LAB ACCESS AND SAFETY**

As PI of this laboratory, I (or my designee) will: (Choose one or both of the following two options.)

Arrange for a lab escort when service providers (e.g., facilities workers, equipment repair

technicians, movers, etc.) need to enter the lab and access their work areas in the lab. Lab

hazard information can be verbally communicated to service providers at this time.

Post a completed CLEARANCE FOR LAB ACCESS form on the main lab entry door if an

escort cannot be arranged. (Link for form is provided in Appendix G.)

----------------------------------------------------

**LAB EQUIPMENT DECONTAMINATION forms** **will be posted on lab equipment to be serviced or moved.**

(Link for form is provided in Appendix G.)

**All forms** **will be posted no later than the anticipated date-of-service**.

## **7. HOUSEKEEPERS LAB ACCESS AND SAFETY**

Does access to any laboratory or work area need to be restricted for housekeepers/ custodians if they perform their duties in lab areas outside of normal work hours (8 a.m.—5 p.m.)?

Yes  No

If yes, list restricted areas:

List the laboratory hazards that housekeepers must be made aware of before they enter your lab areas to perform their tasks:

**Access restrictions and lab hazards must be communicated to the HOUSEKEEPING SUPERVISOR by calling**

**231-4300 for buildings on VT Blacksburg campus. For buildings off campus (ARECs, VTCRI, CRC, etc.)**

**contact the facilities manager or coordinator for housekeeping services in your building.**

## **8*.* HOUSEKEEPING PERFORMED IN WORK LOCATIONS**

PIs must coordinate with Housekeeping supervisors to determine which services are to be provided by housekeepers, and the frequency of service. PIs must determine the nature and frequency of other cleaning tasks to be accomplished by lab personnel. Please document these housekeeping details below.

|  |  |  |
| --- | --- | --- |
| **Cleaning Task** | **Frequency** | **Performed by:** |
| Floors cleaned |  |  |
| Regular trash removed |  |  |
| Biohazardous lab waste removed |  | Laboratory personnel |
| Routine cleaning of counters, sinks, etc. |  | Laboratory personnel |
| Routine cleaning of lab equipment  (refrigerators, incubators, centrifuges, benchtop equipment, etc.) |  | Laboratory personnel |
| Thorough cleaning of laboratory |  | Laboratory personnel |
| Monitoring for insect/ vermin pests | with Enter name of disinfectant | Laboratory personnel |

## **9. TOXINS OF BIOLOGICAL ORIGIN USED/ STORED**

**Are toxins of biological origin used or stored in this laboratory?**

Yes  No

If yes, and not included in an IBC protocol, complete the following table.

If included in IBC protocol, keep printed copy of IBC protocol with this manual.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Toxin** | **Use** | **Volume/aliquot amounts do not exceed federal limit.** | **Dedicated Use Area (Building, Rm #)** | **Secure Storage Provided** | **Location of**  **Inventory & Usage Log (Building, Rm #)** |
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## **10. WORK LOCATIONS**

In the table below, list all rooms, laboratories, growth chambers, greenhouses, etc. associated with your work using biological agents, and list the primary activities that occur there. In instances where both BSL-1 and BSL-2 activities take place in a given space, please indicate by checking both BSL checkboxes.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Building** | **Rm #** | **Area Description**  **(shared area, hallway, greenhouse, etc.)** | **Biosafety**  **Level** | | **Primary Type of**  **Activity Taking**  **Place in Room/Area** | **Other Activity**  **Taking Place in**  **This Area** |
| 1 | 2 |
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## **11. PRIMARY CONTAINMENT EQUIPMENT**

Provide a complete list of primary containment equipment (e.g., BSC, aerosolization chamber, centrifuge safety cups) used to work with biohazardous materials, including (if applicable) the date of the most recent certification.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equipment Type** | **Model or Make** | **EHS Identification #**  **(label on center-front, above glass)** | **Date of Last**  **Certification** | **Location – Rm #** |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| Biosafety Cabinet |  |  |  |  |
| **Other Containment Equipment** | | |  |  |
|  | | |  |  |
|  | | |  |  |
|  | | |  |  |
|  | | |  |  |
|  | | |  |  |

## **12. CONTAINMENT WHEN TRANSPORTING BIOLOGICAL/ BIOHAZARDOUS MATERIALS**

Provide the containment devices used to transport sealed primary containers of biological agents / materials / specimens, etc. from this laboratory to other areas, e.g., to autoclave facility, to freezer storage, to animal facility, to centrifuge room, to microscope or flow cytometer, etc.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Material Being**  **Transported** | **BSL** | | **Type of Containment Used** | **Destination** | | |
| **1** | **2** | **Transporting to location in**  **same building** | **Transporting to location in different building** | **BIOWASTE to autoclave facility** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

## **13. HIGH RISK PROCEDURES/ LOCATIONS**

Check all that apply:

**We will perform BSL-1 lab procedures. If these procedures create aerosols, it is possible they**

**could pose a health risk for people who are immunologically compromised, but generally they**

**do not pose a biohazard risk for healthy people.**

**We will perform BSL-2 aerosol-generating procedures**

(e.g., pipetting, centrifuging, grinding, blending, shaking, mixing, sonicating, opening containers of infectious

materials, inoculating animals intranasally, harvesting infected tissues from animals or eggs, etc.)

**within a biosafety cabinet or other physical containment device to contain aerosols and**

**prevent contamination of surfaces, equipment, etc.**

**Some BSL-2 procedures in this laboratory must be performed outside of the biosafety**

**cabinet or other containment; aerosol controls and surface contamination controls will be**

**used as described in the following table.**

Please complete Table 13.1.

**13.1 BSL-2 Procedures Performed Outside of the Biosafety Cabinet or Other Containment in the Lab**

List and briefly describe location of how biohazard risk will be addressed. Place “N/A” where not applicable.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BSL-2 Tasks**  **Outside of Biosafety Cabinet or Other**  **Containment:** | **Biological**  **Agent(s) Used** | **Where Task**  **Is Performed**  (Bldg, Rm #) | **Refer to**  **University Biosafety Manual** | **Aerosol Containment**  **or Control Used**  (Briefly describe how containment will be provided, or aerosols avoided.) | **Directions**  **for Task Found in SOP** (Title/Section) |
| **Pipetting** |  |  | **Section**  **4.19.1** |  |  |
| **Pouring** |  |  | **Section**  **4.22** |  |  |
| **Shaking** |  |  | **Section**  **4.22** |  |  |
| **Vortex Mixing** |  |  | **Section**  **4.22** |  |  |
| **Mixing/ Blending/**  **Tissue Grinding/ Homogenizing** |  |  | **Section**  **4.22** |  |  |
| **Sonicating** |  |  | **Section**  **4.22** |  |  |
| **Lyophilizing,**  **opening lyophilized cultures** |  |  | **Section**  **4.7.4** |  |  |
| **Manipulation of**  **animals or arthropods** (e.g.,specimen collection, necropsy, surgery, inoculation, etc.) |  |  | **Section**  **4.22** |  |  |
| **Opening frozen vials** |  |  | **Section**  **4.7.3.5** |  |  |
| **Microbial**  **staining/ microscopy with live agents** |  |  | **Section**  **4.22** |  |  |
| **Flow cytometry** |  |  | **Section**  **4.21** |  |  |
| **Other** |  |  |  |  |  |

### **13.2 Procedures Using Sharps**

**Sharp – An object that can pierce or cut skin, causing injury and possible hazardous exposure.**

NOTE:

• Biological sharps with a lower risk for sharps injuries (e.g., pipette tips, plastic serological pipettes, wood applicator sticks, etc.) DO NOT need to be listed in the table below. These items are considered biological sharps because they can pierce an autoclave bag, and thus must be collected in rigid sharps containers. When improperly disposed of in autoclave bags, however, these sharps can cause

unexpected punctures or scratches, as well as exposure risks, so care must be exercised in their disposal.

**Are there sharps with a higher risk of puncture/cut injury used in biohazardous procedures in this lab?**

**Yes**  **No**

If yes, please complete the following table.

|  |  |  |
| --- | --- | --- |
| **Sharp**  (e.g., safety needles with  guard, needles, razor blades, utility knives, scalpels, glass slides, razor in holder, Pasteur pipettes, capillary tubes, etc.**)** | **Procedure**  (Injection, microscopy, isolating gel band, etc.) | **Describe the specific precaution(s)**  **that will be used to minimize the risk**  **associated with the sharp.**  (e.g., PPE, shields on equipment, safety steps in technique/procedure, use of proper sharps containers, caution in disposal practices, etc.) |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

### **13.3 Centrifugation Procedures**

Select the option that describes the centrifugation procedure you use.

|  |  |  |
| --- | --- | --- |
| **Option** | **Your Centrifugation Practices** | **Measures to Follow** |
| **1** | We will use **sealed rotors or aerosol-tight caps on rotor buckets when centrifuging BSL-2 materials.** | • We will follow the mandatory practice of loading and sealing all BSL-2 materials in rotors/buckets inside the biosafety cabinet, and wiping them with disinfectant before placing into the centrifuge.  • We will unload rotors and/or buckets in the biosafety cabinet after centrifuging. |
| **2** | • **When centrifuging BSL-2 agents, we will use non-sealed rotors or buckets that do not have aerosol-tight caps,** which we acknowledge is a practice that is not recommended and that creates an increased risk of potential exposure to infectious material.  • We will wait at least 5 minutes after the spin has stopped before opening the centrifuge lid. | **Provide a procedure below\* which addresses your centrifugation process for reduction of aerosols. Include all containment steps taken throughout the procedure.** |
| **3** | **We will not be centrifuging BSL-2 material.** | **N/A** |

|  |
| --- |
| **\*Centrifugation Procedure for Reduction of Aerosols:** |

## **14. DISINFECTION AGENTS**

* List the disinfectants used in your lab and complete all corresponding information in table below.
* If you apply different concentrations of a disinfectant for different uses, include each concentration in a separate row; add more rows if needed.
* **INCLUDE SAFETY DATA SHEETS FOR DISINFECTANTS IN APPENDIX B OF THIS MANUAL.**
* **BLEACH USE:** 
  + To achieve required disinfection, your stock bleach product (as purchased) should contain a Sodium Hypochlorite (NaOCl) concentration ≥5% before you dilute it to make your working solution.
  + Recommended Dilutions: **1:5** (1 part bleach stock + 4 parts water or liquid) 🡺 spills, liquids, aspiration flasks;

**1:10** 🡺 surfaces contaminated with much organic matter; **1:50** 🡺 surfaces with less organic matter

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Common Name of Stock**  **Product**  (e.g. bleach, isopropyl alcohol, etc.) | **Active Chemical Ingredient(s) and % In Stock Product**  (e.g. 6.24% sodium hypochlorite; 98% isopropanol) | **Final Concentration**  **Of Working Solution**    (e.g., 70% isopropanol)  **OR**  **Final Dilution**  (e.g., 1:10 bleach) | **Working Solution Is**  **Made:** | **Effective Against**  **This Particular Biological Agent(s) Used in Lab:**  (e.g.,*Mycobacterium* sp., *Clostridium* sp.,  *Aspergillus* sp., etc.) | **Primary Use(s)**  **in Lab:** | **Minimum**  **Contact Time:** (minutes) |
|  |  |  | Daily  Weekly  Monthly  Other |  | Surfaces  Liquids  Reusable PPE  Spills  Spores  Other |  |
|  |  |  | Daily  Weekly  Monthly  Other |  | Surfaces  Liquids  Reusable PPE  Spills  Spores  Other |  |
|  |  |  | Daily  Weekly  Monthly  Other |  | Surfaces  Liquids  Reusable PPE  Spills  Spores  Other |  |
|  |  |  | Daily  Weekly  Monthly  Other |  | Surfaces  Liquids  Reusable PPE  Spills  Spores  Other |  |
|  |  |  | Daily  Weekly  Monthly  Other |  | Surfaces  Liquids  Reusable PPE  Spills  Spores  Other |  |

## **15. PPE REQUIRED FOR THIS LAB**

**FOR ALL BIOLOGICAL LABS, LEGS MUST BE PROTECTED BY LONG PANTS OR EQUIVALENT CLOTHING, AND FEET MUST BE PROTECTED BY CLOSE-TOED SHOES; NO SHORTS, NO SANDALS.**

List the PPE that is required to perform biohazardous procedures in this laboratory. If applicable, list all types of each PPE category, i.e., list both nitrile gloves and latex gloves (or cloth lab coats and disposable gowns) if both types are stocked and used for various tasks.

|  |  |  |
| --- | --- | --- |
| **PPE Required For This Lab** | **Location In Main Work Areas**  **List Rm # and briefly describe location in room** (e.g., on bench, on shelves, etc.) | **Location of**  **Stored Supply**  **(if applicable)**  **List Rm #** |
| **Disposable gloves**  (list glove material) |  |  |
|  |  |  |
|  |  |  |
| **Lab Coats** (list cloth or disposable) |  |  |
|  |  |  |
|  |  |  |
| **Eye/ Face Protection** |  |  |
|  |  |  |
|  |  |  |
| **Respirators (if applicable)** |  |  |
|  |  |  |
|  |  |  |
| **Other :** |  |  |
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|  |  |  |
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|  |  |  |
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|  |  |  |

### **15.1 No PPE Beyond Work Area**

PPE worn while working with biohazardous materials in the laboratory or work area will

NOT be worn outside of the laboratory or work area.

***Any exception to this practice must be approved by the EHS Biosafety Office.***

*Please describe any EHS-approved circumstance where lab PPE can be worn outside the lab:*

### **15.2 Disposable Lab Coat Re-Use**

If not contaminated, and if integrity is maintained, disposable lab coats may be re-used in this laboratory for a period of:

### **15.3 Cleaning Of Cloth Lab Coats**

Cloth lab coats will be removed upon getting soiled or contaminated, and will be

decontaminated by autoclaving or by another EHS-approved method, which is:

After being decontaminated, lab coats will be laundered prior to re-use in the lab via

arrangement by the academic department. ***Lab coats must not be laundered at home by***

***lab personnel.***

Cloth lab coats *in general use* that are not overtly soiled or contaminated will be laundered at

the following interval, not to exceed 3 months:

***Lab-Spedfic Biosafety Manual* 17**

### **15.4 Cleaning/ Decontaminating Reuseable PPE**

List re-useable PPE (face shields, eye protection, respirators, etc.) used in the lab, and the cleaning and decontamination method required after use:

## **16. BIOLOGICAL WASTE MANAGEMENT**

This laboratory will follow the practices of biological waste container selection,

collection, handling, decontamination and disposal as detailed in EHS *Hazardous*

*Laboratory Waste* online training, and in the UBM, Section 4.8, which includes:

• Waste generated in a BSC

• Liquid biohazardous waste

• Solid biohazardous waste

• Sharps biohazardous waste

• Regulated Medical Waste

• Animal and animal-related wastes

• Plant and plant-related wastes

**This laboratory will also follow the lab-specific stipulations for hazardous waste as detailed below.**

(Check all that apply, and enter any other specific waste handling requirements.)

These biowaste items or categories of items must be disposed of in RMW FOR

INCERATION ONLY:

(Contact EHS if you need to have this waste stream established in your area.)

Un-autoclaved waste can be left in the laboratory for no longer than       .

It will not be left in the lab or autoclave facility over weekends/ holidays; it will be

autoclaved and disposed of prior to periods of lab closure.

Aspiration traps will be regularly filled with fresh disinfectant, and liquid waste regularly removed and decontaminated; traps will not be allowed to accumulate liquid waste for more than one week.

Certain biohazardous waste material generated in this lab requires non-standard autoclave operation settings for successful decontamination (e.g., longer cycle time to kill heat- resistant spores).

For this biowaste material, (     ) , decontamination will be achieved as follows:

Autoclave is programmed for the required alternative setting(s):

Standard autoclave settings must be changed to required values per cycle,

(list values here:       ) then returned to standard settings by the

autoclave user.

Other:

## **17. INTEGRATED PEST MANAGEMENT PROGRAM FOR THE LABORATORY**

* Insect and rodent pests present a contamination risk and containment breech in laboratory areas, therefore an integrated pest management program is an important part of managing a research facility.
* The most common approach to pest control is the application of pesticides as a preventive or remedial measure. This can be effective as a corrective action, but pesticide use has limited long-term effects when used alone. In addition, pesticides can contaminate the research environment via volatilization.
* To minimize the presence of pests and the use of pesticides in the lab, a comprehensive effort is required that integrates housekeeping, maintenance and pest control, and is the responsibility of the PI and laboratory personnel to manage this integration, as each situation necessitates.

The PI or designee has implemented, and ensures the maintenance of an integrated pest management program that prevents pest problems in the following ways:

* + Food and drink, and food/drink storage are not allowed in any BSL-1 or BSL-2 space.
  + Lab floors are routinely cleaned and mopped.
  + If lab staff place insect bait traps in the lab, traps are regularly monitored and replaced.
  + Lab workers maintain a daily visual awareness for the presence of vermin and insects.
  + Lab workers report any signs of insects/ pests to the PI or lab manager, who then contacts Facilities to arrange pest control/removal by appropriate means; lab workers document any service provided.

## **18. MEDICAL SERVICES**

Lab workers will complete the Occupational Health [Medical Survey Questionnaire](https://secure.hosting.vt.edu/www.ehss.vt.edu/med_survey/) before

beginning bench work in the laboratory, and will update their surveys 1) annually, 2) when

risks in the lab change, and 3) when health status of the worker changes.

## **19. LABORATORY TRAINING**

**For new personnel joining the lab group, the PI/ designee will:**

• Ensure that new lab personnel complete all required ONLINE training before beginning bench work.

• Provide new lab personnel with:

o safety orientation (e.g., evacuation routes, safety equipment in lab, spill and reporting procedures, etc.)

o training on lab-specific practices, equipment, agents, hazards, hazardous waste management, etc. before they begin to work independently in the lab.

**For existing personnel in the lab group, the PI/ designee will:**

• Ensure that existing lab personnel complete required REFRESHERs for expired training to maintain

compliance with federal, state and university regulations.

• Provide existing lab personnel with:

o lab safety and biosafety updates/refreshers as needed.

o specific training on new procedures and equipment.

o remedial training, higher level training, and proficiency evaluations as needed.

**The PI/designee agrees to:**

1) Provide (or see to the provision of) all training, as needed, in a timely way for the constituent groups noted here.

2) Document the receipt of lab-specific training provided to personnel. ***(See Appendix G for***

***training forms and templates.)***

3) Maintain these records electronically or in printed form for all current personnel, and for 3 years after personnel leave the lab setting.

## **20. BIOHAZARD AWARENESS TRAINING**

**BIOHAZARD AWARENESS TRAINING FOR YOUR PERSONNEL**

**For the safety of your personnel who share space with others using biohazardous agents, the**

**PI/ designee will:**

•   Maintain awareness of the agents currently studied in nearby labs and manipulated in spaces shared by your lab personnel.

•  In instances where the agents used by others in shared spaces will present significantly different hazards and mitigations from the agents used by your personnel, ensure that your personnel are provided with biohazard awareness training, in a timely way, by the appropriate PI/designee.

•   Ensure that the training is documented by the provider, and has the signatures of all recipients. ***(See Appendix G for templates of training records; the Biohazard Awareness Training Record template provides appropriate topics to be covered.)***

• Keep these records for awareness training in your Lab-Specific Biosafety Manual, or other specified location in the lab. Awareness training records will be checked upon lab inspection.

## **21. LAB WORKER PROFICIENCY**

**The PI/ designee will exercise due diligence in enabling lab workers to achieve:**

• Completion of health screening and medical requirements

• Completion of required training for working safely in the lab

• Technical proficiency, especially in use of containment equipment and practices

• Good work habits

**If found to be deficient in any area, lab workers will undergo additional training and**

**supervision, and be evaluated by PI or designee for proficiency to work in the laboratory.**

# **APPENDICES**

**A. Biological Agents and Materials List**

**B. Risk Assessments and Safety Data Sheets**

**C. Personnel List**

**D. Standard Operating Procedures**

**E. Lab Sketch**

**F. Exposure Control Plan Guidance Table**

**G. Forms and Templates for General Use**

**H. Biosafety Training Documentation**

## **Appendix A**

# BIOLOGICAL AGENTS AND MATERIALS LIST

**To print the list from your IBC protocol:**

1. Log into IBC Protocol Management (<https://secure.research.vt.edu/ibc>).
2. In the “My IBC Protocols” screen, click the settings icon (gear icon under protocol status heading).
3. Click “View/print a lab-friendly version for biosafety manual”.
4. Click “Print summary” (blue button in top right corner of page).

## **Appendix B**

# RISK ASSESSMENTS AND SAFETY DATA SHEETS

**BIOHAZARD RISK ASSESSMENTS FOR BIOLOGICAL AGENTS USED**

[If applicable, these can be opened and printed from Section 5 of your IBC protocol

(<https://secure.research.vt.edu/ibc>).]

**PATHOGEN SAFETY DATA SHEETS (PSDS) FOR BIOLOGICAL AGENTS /TOXINS USED**

[If applicable, these can be opened and printed from Section 5 of your IBC protocol (<https://secure.research.vt.edu/ibc>).]

**SAFETY DATA SHEETS (SDS) FOR DISINFECTANTS USED**

## **Appendix C**

# PERSONNEL LIST

**To print the list from your IBC protocol:**

1. Log into IBC Protocol Management (<https://secure.research.vt.edu/ibc>).
2. In the “My IBC Protocols” screen, click the settings icon (gear icon under protocol status heading).
3. Click “View/print a lab-friendly version for biosafety manual”.
4. Click “Print summary” (blue button in top right corner of page).

## **Appendix D**

# STANDARD OPERATING PROCEDURES

## **Appendix E**

# LABORATORY SKETCH/ LAYOUT

[If applicable, these can be opened and printed from Section 5 of your IBC protocol (<https://secure.research.vt.edu/ibc>).]

## **Appendix F**

# EXPOSURE CONTROL PLAN (ECP) GUIDANCE TABLE

**Exposure Control Plan (ECP) Guidance Table**

• Employers are mandated by OSHA to provide an Exposure Control Plan (ECP) to employees with BBP exposure risks in their jobs. Exposure Control Plans are intended to provide information and promote work practices that will decrease/ eliminate occupational risks of BBP exposure. ECPs must include:

o The specific BBP risks in manipulating biohazardous material, or performing particular tasks

o The practices and controls in place to mitigate those risks

o What to do in the event of an exposure, including how to report it

o What to expect from an exposure investigation and follow-up

o The types of records to be kept regarding BBP training, exposures, etc.

o Where to find the ECP if employees need to refer to it

• Virginia Tech maintains a [University Exposure Control Plan,](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=exposure+control+plan&document_id=507) which is a document used by facilities on campus that draw human blood and/or handle human clinical/diagnostic material. Because OSHA allows employers to include the content of an ECP in other documents (such as Biosafety Manuals), and because this content is now included in the *University Biosafety Manual* (UBM) and your completed *Lab-Specific Biosafety Manual* (LSBM), VT research laboratories do not have to maintain duplicate information in a

separate ECP.

• **In reading this Manual and the online University Biosafety Manual, you will have reviewed all required topics, including lab-specific information. See the following guidance table for topic locations in each manual. The table also is provided in the University Biosafety Manual.**

|  |  |  |
| --- | --- | --- |
| **EXPOSURE CONTROL PLAN TOPICS** | **READ ABOUT IT IN THESE SECTIONS OF THE *UNIVERSITY BIOSAFETY MANUAL* (UBM):** | **FIND DETAILS FOR YOUR LAB IN**  **THESE SECTIONS OF THE**  ***LAB-SPECIFIC BIOSAFETY MANUAL***  **(LSBM):** |
| **BBP Risks for Lab Workers** | **7.1** |  |
| **OSHA BBP Standard & Exposure Control Plan** | **7.3** |  |
| **Universal Precautions** | **4.1** |  |
| **Engineering Controls:**  • Handwashing facilities |  | **3.2** |
| • Needle safety; Sharps containment | **4.5** | **13.2** |
| • Biosafety cabinet containment | **11** | **11** |
| **Personal Protective Equipment** | **4.6** | **15** |
| **Work Practices:**  • Handwashing | **4.4** |  |
| • Sharps handling & disposal | **4.5** | **13.2** |
| • Avoiding aerosols | **4.22** | **13.1** |

|  |  |  |
| --- | --- | --- |
| • Avoiding ingestion | **4.2, 4.3** |  |
| • Decontaminating surfaces | **4.12** | **14.1** |
| • Decontaminating equipment | **4.13** |  |
| • Waste handling | **16** | **16** |
| **Housekeeping Practices** | **8** | **8** |
| **Labels and Signs** | **3.1** |  |
| **Occ. Health Medical Services**  • Hepatitis B vaccination | **7.5** |  |
| • What constitutes an exposure | **7.6** |  |
| • BBP exposure response | **7.7** |  |
| • BBP exposure reporting | **7.8** |  |
| • BBP exposure investigation & follow-up | **7.9** |  |
| **BBP Recordkeeping** | **7.10** |  |
| **HIV/ HBV/ HCV Lab Practices** | 7.11 |  |
| **BBP Definitions** | **Terms Related To BBP** |  |

## **Appendix G**

# FORMS AND TEMPLATES FOR GENERAL USE

[Double click on the form names below to open links to documents.]

**1.** [**Biological Agent Risk Assessment Form**](https://ibc.researchcompliance.vt.edu/sites/ibc.researchcompliance.vt.edu/files/general_risk_assessment.pdf)

**2.** [**Equipment Decontamination Form**](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=equipment+decontamination+form&document_id=583)

**3.** [**Clearance for Lab Access Form**](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=lab+access+form&document_id=560)

**4.** [**Notification of Toxin Transfer Form**](http://www.ehss.vt.edu/detail_pages/document_list.php?s_document_title=notification+of+toxin+transfer+form)

**5.** [**Biohazardous Shipping Request Form**](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=shipping+request+form&document_id=548)

**6. [Lab Incident Report Form](http://www.ehss.vt.edu/detail_pages/document_details.php?s_document_title=incident+report&document_id=320)**

**7.** [**Laboratory Standard Operating Procedure (SOP) template**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=3&document_id=564)

## **Appendix H**

# BIOSAFETY TRAINING DOCUMENTATION

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Double click on the form names below to open links to documents, OR, see the following pages for printed copies of all four Training Forms.
* See the next page for a Biosafety Training Reference Table, which describes biosafety training needed by different groups, and the appropriate documents to use to record training.

**Training Forms:**

1. [**Biosafety Training Record for New Personnel**](https://www.ehss.vt.edu/detail_pages/document_details.php?category_id=18&document_id=565)

**(Required training documentation for all lab workers; use to record receipt of lab-specific training for new personnel, and to document training/proficiency status of existing personnel.)**

1. [**Lab Topics Training Record**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=3&document_id=567)

**(Use as needed to record receipt of training on new topics for existing lab personnel.)**

1. [**Biohazard Awareness Training Record**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=2&document_id=566)

**(Use as needed to evaluate & document proficiency after remedial or higher level training.)**

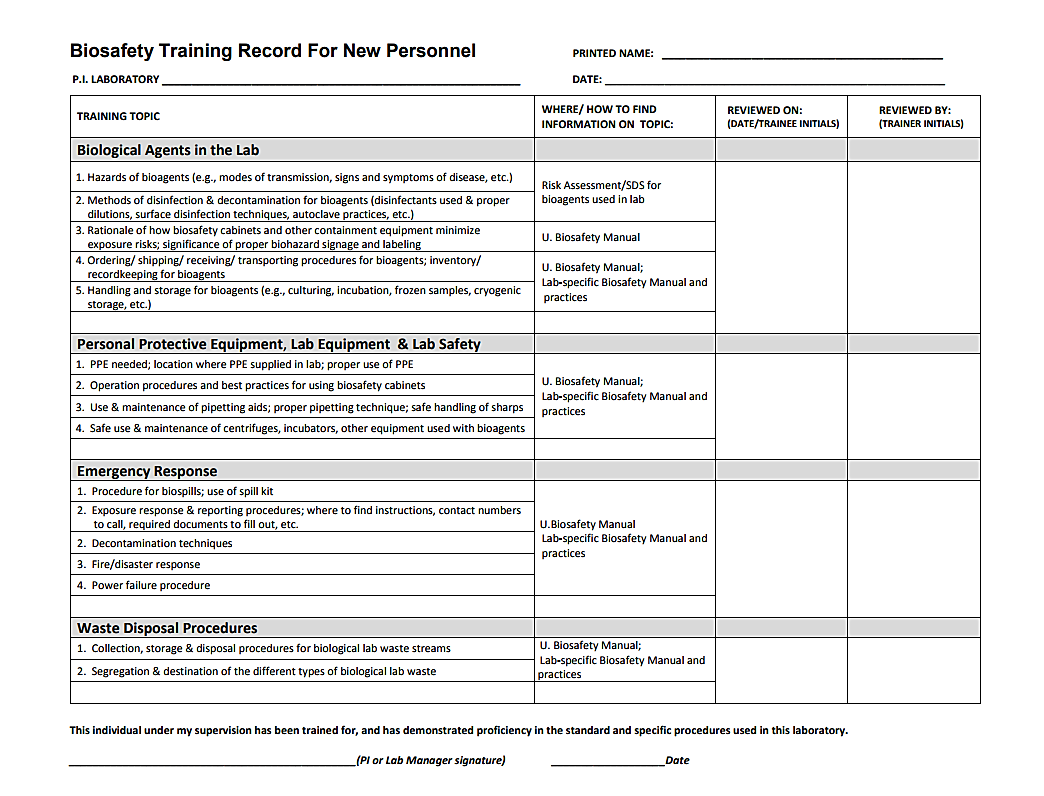
1. [**Proficiency Checklist for Lab Personnel**](http://www.ehss.vt.edu/detail_pages/document_details.php?categories_document_categ1Page=3&document_id=568)

**(Use as needed to record receipt of awareness training for 1) personnel using shared spaces/ equipment, or 2) for those working in the lab who do not handle biohazards.)**

**IN THIS SECTION (Appendix H) OF THE LSBM, KEEP COMPLETED *BIOSAFETY TRAINING RECORDS FOR NEW PERSONNEL* (PRINTED PAGES), AND ANY OTHER COMPLETED BIOSAFETY TRAINING DOCUMENTS YOU MAY GENERATE.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **People**  **To Train** | **Type of Training Needed** | **Training Document To Use** | **What the Document Certifies** | **Who Provides Training** |
| **New lab personnel who will be working with biohazards** | EHS online training | Training is documented electronically in EHS training database and can be accessed on an individual’s EHS Training Profile. | * Trainee is credited with successful completion of module. * Trainee name, date of training completion, when training expires | EHS -- online training modules |
| * Biosafety training specific to your lab’s procedures, equipment & agents. * Safety orientation (e.g., evacuation routes, safety equipment, reporting procedures, etc.) | ***Biosafety Training Record for New Lab Personnel***  **(Serves as lab-specific training template for topics to cover, training record sheet, and record of proficiency)** | * Trainee understands topic areas covered. * Trainee is generally proficient in lab procedures covered. * Trainee/trainer names, signatures, date | Principal Investigator or designee |
| **Existing lab personnel working with biohazards** | * Biosafety refresher or review * Specific training on new procedures, equipment, etc. | ***Lab Topics Training Record***  **(Trainer fills in the lab topic covered; trainees/ participants sign on a signature page)** | * Topics covered * Trainee/trainer names & date of training | Principal Investigator or designee |
| * Higher-level, comprehensive lab training * Remedial training in one or more areas | ***Biosafety Proficiency Checklist***  **(Serves as template for topics to cover and proficiency evaluation; can be customized according to need)** | * Trainee understands all topic areas covered. * Trainee has demonstrated proficiency in specific lab skills & methods. * Trainee/trainer names, signatures, date |
| **Other lab personnel with whom you share lab space, facilities or equipment**  **OR**  **Personnel working in lab but NOT with biohazards** | Lab-specific training to provide awareness of biohazards present in lab, & appropriate response to exposures, signs of disease, lab incidents, etc. | ***Bioawareness Training Record***  **(Serves as template for topics to cover and training record sheet; can be customized according to situation)** | * Trainee understands topic areas covered. * Trainee/trainer names, signatures & date of training |

**BIOSAFETY TRAINING REFERENCE TABLE**



**Lab Topics Training Record**

**Training Location: Date: Trainer(s):**

**New Topic(s) Covered:**

**Refresher Training on:**

**The following laboratory personnel attended this training and had the opportunity to ask questions and receive answers regarding topics covered:**

|  |  |
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| **PRINT NAME** | **SIGN NAME** |
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**Biohazard Awareness Training**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date of Training:** | **Trainer(s):** | | |
| **For users of shared space located in:**  **(building/rm #)** | | | |
| **Biohazardous agents used in that space:** | | | |
| **Trainees have signed the attached Signature Page** | | | |
| **TRAINING TOPIC** | | **N/A** | **TRAINER INITIALS** |
| **Biohazard Awareness:** | |  |  |
| 1. Specific hazards of biohazardous agents/material used (route of transmission, signs and symptoms of disease, etc.) | |  | Click here to enter text. |
| 2. Significance of biohazard warnings signs/ labels | |  |
| 1. How & where agents are handled and stored in the space | |  |
| 1. Hazards associated with common-use equipment shared by lab groups using bioagents | |  |
| Click here to enter text. | |  |
| **Precautions:** | |  |  |
| 1. Avoid direct contact with-- (specific lab equipment, surfaces, etc.) | |  |  |
| 1. Appropriate use of PPE | |  |
| 1. Best practice for personal items—avoid bringing/using them in lab areas   Best practice for lab-use items (pens, notebooks)---avoid taking them out of lab areas | |  |
| 1. Disinfection methods; appropriate disinfectants; importance of handwashing and avoiding hand-to-face contact | |  |
| 1. Personnel health monitoring and status | |  |
| Click here to enter text. | |  |
| **Emergency Response** | |  |  |
| 1. Procedure if you encounter a biohazardous spill:  * Notify a supervisor and clear the area * Spill will be cleaned up by lab workers or professionals * All others stay away | |  | Click here to enter text. |
| 1. Incident / exposure response and reporting  * Flush exposure site with water; first aid if needed * Report to PI, Lab facilities Manager, Biosafety office immediately | |  |
| Click here to enter text. | |  |

**SIGNATURE PAGE for Biohazard Awareness Training**

**I have been provided information on the biohazards being used in other areas of the lab by a Principal Investigator or his/her designee, and I have had a chance to ask questions concerning the agents/ material being used.**

|  |  |  |
| --- | --- | --- |
| **PRINT NAME** | **SIGN NAME** | **DATE** |
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**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 1 of 6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Biological Materials** | **YES** | **NO** | **N/A** |
| 1. Understand the concept of biohazardous materials and can identify them in the lab; understands biosafety levels and risk groups; can describe how they differ and how they are related. |  |  |  |
| 2. Understand the association of infectious agents and toxins to disease. |  |  |  |
| 3. Understand the elements of a bioagent risk assessment, including infectious dose, incubation period, viability, drug resistance, modes of transmission, routes of entry, etc., and can apply that information to appropriate handling practices for bioagents. |  |  |  |
| 4. Describe and appropriately use PPE required for handling bioagents. |  |  |  |
| 5. Describe and use work practices that reduce or control exposure risks, including proper centrifuge/rotor practices, BSC practices, autoclave use, etc. |  |  |  |
| 6. Know how to properly use a biosafety cabinet and other containment equipment/ engineering controls used with biohazards, as well as verify their functionality, recognize limitations, possess awareness of inspections and certifications status, and recognize/properly respond to malfunctions. |  |  |  |
| 7. Recognize and predict potential aerosol generation, sharps hazards, or contact hazards in using lab equipment or performing procedures with bioagents; identify and use appropriate control measures. |  |  |  |
| 8. Explain and execute handling, incubation and storage requirements for bioagents (examples: CO2 incubation, liquid nitrogen storage, -80 storage, lyophilization procedures, etc.) |  |  |  |
| 9. Understand and successfully perform aseptic technique, including bench methods for maintenance of pure cultures, verifying culture purity, sterilization and filtration methods, etc. |  |  |  |
| 10. Follow appropriate procedures for labeling of bioagents and for keeping bioagent records, inventories, logs, etc. |  |  |  |
| 11. Follow appropriate procedures for securing bioagents in active use or in  storage. |  |  |  |
| 12. Follow required containment practices when transporting bioagents. |  |  |  |
| 13. Proficient in lab procedures for biowaste handling, decontamination by autoclaving and other methods, verifying autoclave function, and waste disposal, including contaminated sharps. |  |  |  |

**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 2 of 6**

|  |  |  |  |
| --- | --- | --- | --- |
| 14. Explain and execute spill response and cleanup procedures for biospills. |  |  |  |
| 15. |  |  |  |
| 16. |  |  |  |
| 17. |  |  |  |
| **Research Animals** | **YES** | **NO** | **N/A** |
| 1. Understand the hazards associated with handling animals used in the lab’s research, including experimentally infected animals. |  |  |  |
| 2. Describe the possible routes of exposure for lab workers when they perform animal procedures. |  |  |  |
| 3. Describe and utilize control measures and work practices to mitigate the risks when working with research animals. |  |  |  |
| 4. Understand the risks associated with development of animal allergies, and the mitigation measures to take for these risks. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |
| **Chemical Materials** | **YES** | **NO** | **N/A** |
| 1. Identify chemicals in the lab and describe their associated hazards when used  in lab procedures; identify any high-hazard chemicals in the lab, including toxins, and know required procedures for handling, storage and disposal. |  |  |  |
| 2. Successfully interpret & use safety data sheets (SDS) and other sources of  Information, including container labels, to learn how to mitigate chemical  exposure risks, to properly handle/store/dispose of chemicals, etc.; apply that  information to use appropriate chemical containment, PPE, handling and  storage practices, etc. |  |  |  |
| 3. Know how to correctly use a chemical fume hood. |  |  |  |
| 4. Know how to safely use compressed gases in the lab, how to use regulators, how to safely transport and store compressed gas cylinders. |  |  |  |
| 5. Know how to safely handle/ transport liquid nitrogen, and how to safely use cryogenic storage vessels. |  |  |  |

**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 3 of 6**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4. Know how to safely transport chemicals using secondary containers and carriers or carts. |  |  | |  |
| 5. Know how to dispose of solid, liquid and gaseous chemical wastes, and request hazardous wastes pickup. |  |  | |  |
| 6. Know how to correctly respond to a chemical spill and a chemical exposure. |  |  | |  |
| **Radiologic Materials** | **YES** | **NO** | | **N/A** |
| 1. Identify radiologic materials used in the lab and describe hazards associated with them when used in lab procedures; describe the concept of ALARA (as low as reasonably achievable). |  |  | |  |
| 2. Successfully interpret and use sources of information, including container labels, to learn physical and health hazards, routes of exposure, etc. of radiologic materials. |  |  | |  |
| 3. Describe and use PPE, engineering controls, proper storage requirements, inventory and survey requirements, and training requirements for using radiologic materials. |  |  | |  |
| 4. |  |  | |  |
| 5. |  |  | |  |
| 6. |  |  | |  |
| **Physical Hazards in the Lab** | **YES** | **NO** | **N/A** | |
| 1. Describe physical hazards in the lab, including:   * proper use/disposal of sharps * use of compressed gases and use of vacuum * hazardous temperature extremes associated with lab work (LN2, autoclave) * nonionizing radiation hazards (lasers, UV), * specific hazards associated with equipment (centrifuges) * slip/fall hazards in lab |  |  |  | |
| 2. Know the control measures & work practices used for the physical hazards listed above. |  |  |  | |
| 3. |  |  |  | |
| 4. |  |  |  | |

**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 4 of 6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk Assessment, Hazard Controls and Communication** | **YES** | **NO** | **N/A** |
| 1. Recognize potential hazards associated with lab materials and procedures, understand and implement the risk assessment process, identify control measures through that process, implement the control measures, and know how to monitor them for effectiveness. |  |  |  |
| 1. Know the PPE required for general lab procedures, chemical handling, etc. |  |  |  |
| 2. Know the general engineering controls in the lab and their correct uses, their limitations, their inspection/certification status and processes, how to monitor them, how to determine when they are malfunctioning, and procedures for reporting malfunctions. |  |  |  |
| 3. Know the importance of safety signs, labels and posted information. |  |  |  |
| 4. Describe how to label samples, containers, cultures, etc. according to regulatory requirements. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |
| **Regulations, Security and Safety Compliance** | **YES** | **NO** | **N/A** |
| 1. Know and follow institutional safety and occupational health requirements, as well as the laboratory’s safety practices and SOPs. |  |  |  |
| 2. Know locations of manuals, be knowledgeable of content, and follow their guidelines and regulations. |  |  |  |
| 3. Complete initial required safety training, and keep training current. |  |  |  |
| 4. Adhere to the laboratory’s security requirements. |  |  |  |
| 5. Know routine monitoring processes for equipment and facilities; recognize deviations from normal operations/procedures, and know how, and to whom, to report them. |  |  |  |
| 6. Know and follow quality assurance procedures in lab. |  |  |  |
| 7. Know and follow procedures for records management in lab. |  |  |  |
| 8. |  |  |  |
| 9. |  |  |  |
| **Occupational Health/ Incident Response & Reporting** | **YES** | **NO** | **N/A** |

**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 5 of 6**

**Page 4 of**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Know how and why to monitor personal health status and changes as related to working with biohazardous materials and chemicals in the lab. |  |  |  |
| 2. Know procedures for reporting an exposure or other lab incident/accident. |  |  |  |
| 3. Know signs and symptoms in humans following exposure to hazardous materials. |  |  |  |
| 4. |  |  |  |
| 5. |  |  |  |
| **Emergency Response** | **YES** | **NO** | **N/A** |
| 1. Recognize incidents that should be reported and significance of alarms. |  |  |  |
| 2. Know how to report a lab emergency according to institutional plans/policies. |  |  |  |
| 3. Know the building’s emergency response plan for evacuation, for shelter-in-  place and secure-in-place emergencies. |  |  |  |
| 4. Know your role in responding to emergencies and other incidents, including disinfection and exposure prevention procedures, spill response, exposure response, and first aid response. |  |  |  |
| 5. Know the lab’s incident follow-up process. |  |  |  |
| 6. Comply with emergency response training requirements, and participate in drills/exercises for lab personnel. |  |  |  |
| 7. Take required training in emergency response and keep training current (example: Portable Fire Extinguisher training). |  |  |  |
| 8. |  |  |  |
| 9. |  |  |  |

**Biosafety Proficiency Checklist for Laboratory Personnel**

**Name: Evaluator:**

**Date: Page 6 of 6 Page 4 of**

**SUMMARY**

|  |  |  |
| --- | --- | --- |
| **TOPIC AREA (check those that apply)** | **PROFICIENT** | **NEEDS WORK:** |
| **Biological Materials** |  |  |
| **Research Animals** |  |  |
| **Chemical Materials** |  |  |
| **Radiologic Materials** |  |  |
| **Physical Hazards in Lab** |  |  |
| **Risk Assessment, Hazard Controls**  **and Communication** |  |  |
| **Occupational Health/ Incident**  **Response and Reporting** |  |  |
| **Emergency Response** |  |  |



Division of Public Safety

**ENVIRONMENTAL HEALTH AND SAFETY**

575 Beamer Way

Blacksburg, VA 24061

540-231-3600

www.ehs.vt.edu

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