



Office of Environmental Health & Safety

Laboratory Safety Inspection

**BSL-2 Laboratories**

<b>a</b>	Principle Investigator Instructor/Laboratory Supervisor	
<b>b</b>	Inspection Date(s)	
<b>c</b>	Inspector's Name(s)	
<b>d</b>	Proposal Number	
<b>e</b>	Proposal Title	
<b>f</b>	Laboratory Location	

(1) Lab personnel have specific training in handling pathogenic agents and are directed by competent scientists; (2) access to the laboratory is limited when work is being conducted; (3) extreme precautions are taken with contaminated sharp items; and (4) certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment.

Item	Question	Response			Comments	Ref.
		Yes	No	N/A		
<b>A. Standard Biological Safety</b>						
1	<b>Access</b> to the laboratory is limited or restricted at the discretion of the laboratory director when experiments or work with cultures and specimens are in progress.					CDC/BMBL
2	Persons <b>wash their hands</b> after they handle viable materials, after removing gloves, and before leaving the laboratory					CDC/BMBL
3	<b>Eating, drinking, smoking</b> , handling contact lenses, applying cosmetics, and storing food for human use are not permitted in the work areas. Persons who wear contact lenses in laboratories should also wear goggles or a face shield. Food is stored outside the work area in cabinets or refrigerators designated and used for this purpose only.					CDC/BMBL
4	<b>Mouth pipetting</b> is prohibited; mechanical pipetting devices are used.					CDC/BMBL
5	Policies for the safe handling of <b>sharps</b> are instituted.					CDC/BMBL
6	All procedures are performed carefully to minimize the creation of splashes or <b>aerosols</b> .					CDC/BMBL

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7	<b>Work surfaces</b> are <b>decontaminated</b> at least once a day and after any spill of viable material with disinfectants that are effective against the agents of concern.					CDC/BMBL
8	All <b>cultures</b> , stocks, and other regulated wastes are <b>decontaminated</b> before disposal by an approved decontamination method such as <b>autoclaving</b> . Materials to be decontaminated outside of the immediate laboratory are placed in a durable, leak proof container and closed for transport from the laboratory. Materials to be decontaminated off-site from the facility are packaged in accordance with applicable local, state, and federal regulations before removal from the facility.					CDC/BMBL
<b>B. Special Practices</b>						
1	Persons who are at increased risk of acquiring infection, or for whom infection may have serious consequences, are not allowed in the laboratory or animal rooms. For example, persons who are <b>immunocompromised</b> or <b>immunosuppressed</b> may be at increased risk. The laboratory director has the final responsibility for <b>assessing each circumstance</b> and determining who may enter or work in the laboratory or animal room.					CDC/BMBL
2	The laboratory <b>director establishes policies and procedures</b> whereby only persons who have been advised of the potential hazards and meet specific entry requirements (e.g., immunizations) may enter the laboratory.					CDC/BMBL
3	A <b>Biohazard sign</b> must be posted at the entrance to the laboratory when <b>Etiologic agents are in use</b> . Appropriate information to be posted includes the agent(s) in use, the <b>Biosafety level</b> , the <b>required immunizations</b> , the <b>Investigator's name</b> and <b>telephone</b> number, any <b>personal protective equipment</b> that must be worn in the laboratory, and any procedures required for exiting the laboratory.					CDC/BMBL
4	Laboratory personnel receive appropriate <b>immunizations</b> or tests for the agents handled or potentially present in the laboratory (e.g., hepatitis B vaccine or TB skin testing).					CDC/BMBL
5	When appropriate, considering the agent(s) handled, <b>baseline serum</b> samples for laboratory and other at-risk personnel are collected and stored. Additional serum specimens may be collected periodically, depending on the agents handled or the function of the facility.					CDC/BMBL

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6	Biosafety procedures are incorporated into standard operating procedures or in a <b>Biosafety manual</b> adopted or prepared specifically for the laboratory by the laboratory director. Personnel are advised of special hazards and are required to read and follow instructions on practices and procedures.					CDC/BMBL
7	The laboratory director ensures that laboratory and support personnel receive <b>appropriate training</b> on the potential hazards associated with the work involved, the necessary precautions to prevent exposures, and the exposure evaluation procedures. Personnel receive annual updates or additional training as necessary for procedural or policy changes.					CDC/BMBL
8	A high degree of precaution must always be taken with any contaminated <b>sharp items</b> , including needles and syringes, slides, pipettes, capillary tubes, and scalpels.					CDC/BMBL
9	Only <b>needle-locking syringes or disposable syringe needle units</b> (i.e., needle is integral to the syringe) are used for injection or aspiration of infectious materials. Used disposable needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal; rather, they must be carefully placed in conveniently located <b>puncture-resistant containers</b> used for sharps disposal. Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.					CDC/BMBL
10	Cultures, tissues, specimens of body fluids, or potentially infectious <b>wastes are placed in a container</b> with a cover that prevents leakage during collection, handling, processing, storage, transport, or shipping.					CDC/BMBL
11	<b>Laboratory equipment and work surfaces should be decontaminated</b> with an effective disinfectant on a routine basis, after work with infectious materials is finished, and especially after overt spills, splashes, or other contamination by infectious materials. Contaminated equipment must be decontaminated according to any local, state, or federal regulations before it is sent for repair or maintenance or packaged for transport in accordance with applicable local, state, or federal regulations, before removal from the facility.					CDC/BMBL

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12	<b>Spills and accidents</b> that result in overt exposures to infectious materials are immediately reported to the lab director. <b>Medical evaluation, surveillance,</b> and treatment are provided as appropriate and written records are maintained.					CDC/BMBL
13	Animals not involved in the work being performed are not permitted in the lab.					CDC/BMBL
<b>C. Safety Equipment (Primary Barriers)</b>						
1	Properly maintained <b>Biological Safety Cabinets</b> , preferably Class II, or other appropriate personal protective equipment or physical containment devices are used.					CDC/BMBL
	VOC					
	Class I - 75 - no product protection	to outside				
	Class II, A1 - 75 lfpm; 70% recirculated to the cabinet work area through HEPA ; 30% HEPA back into room or to outside through a canopy unit	no				
	Class II, B1 -100 lfpm; 30% recirculated, 70% exhausted. Exhaust cabinet air must pass through a dedicated duct to the outside through a HEPA filter.	yes				
	Class II, B2 - 100 lfpm; No recirculation; total exhaust to outside through a HEPA filter.	yes				
	Class II, A2 - Similar to II, A1, but has 100 lfpm intake air velocity and plenums are under negative pressure to room; exhaust air can be ducted to outside through a canopy unit.	to outside				
Class II A/B3 - Is Class II A but when ducted to outside becomes Class II B3 suitable for VOCs.	to outside					
2	<b>Procedures</b> with a <b>potential for creating infectious aerosols</b> or splashes are conducted. These may include centrifuging, grinding, blending, vigorous shaking or mixing, sonic disruption, opening containers of infectious materials whose internal pressures may be different from ambient pressures, inoculating animals intranasally, and harvesting infected tissues from animals or embryonated eggs.					CDC/BMBL
3	High concentrations or large volumes of infectious agents are used. Such materials may be <b>Centrifuged</b> in the open laboratory if sealed rotor heads or centrifuge safety cups are used, and if these rotors or safety cups are opened only in a biological safety cabinet.					CDC/BMBL

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4	<b>Face protection</b> (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials to the face when the microorganisms must be manipulated outside the BSC.					CDC/BMBL
5	Protective <b>Laboratory coats</b> , gowns, smocks, or uniforms designated for lab use are worn while in the laboratory.					CDC/BMBL
6	<b>Gloves</b> are worn when hands may contact potentially infectious materials, contaminated surfaces or equipment. Wearing two pairs of gloves may be appropriate. Gloves are disposed of when overtly contaminated, and removed when work with infectious materials is completed or when the integrity of the glove is compromised. Disposable gloves are not washed, reused, or used for touching "clean" surfaces (keyboards, telephones, etc.), and they should not be worn outside the lab. Alternatives to powdered latex gloves should be available. Hands are washed following removal of gloves.					CDC/BMBL
<b>D. Laboratory Facilities (Secondary Barriers)</b>						
1	Provide <b>lockable doors</b> for facilities that house restricted agents (as defined in 42 CFR 72.6)					CDC/BMBL
2	Each laboratory contains a <b>sink</b> for hand washing.					CDC/BMBL
3	The <b>laboratory</b> is designed so that it can be <b>easily cleaned</b> . Carpets and rugs are not appropriate. Bench tops are impervious to water and are resistant to moderate heat and the organic solvents, acids, alkalis, and chemicals used to decontaminate the work surface and equipment.					
4	<b>Bench tops</b> are impervious to water and are resistant to moderate heat and the organic solvents, acids, alkalis, and chemicals used to decontaminate the work surface and equipment.					CDC/BMBL
5	<b>Laboratory furniture</b> is capable of supporting anticipated loading and uses. Chairs and other furniture used in laboratory work should be covered with a non-fabric material that can be easily decontaminated. Spaces between benches, cabinets, and equipment are accessible for cleaning.					CDC/BMBL
6	An <b>eye wash station</b> is readily available.					
7	<b>Illumination</b> is adequate for all activities, avoiding reflections and glare that could impede vision.					

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<b>E. Emergency Preparedness</b>						
1	Are <b>first aid supplies</b> clearly labeled and current with respect to shelf life?					CDC/BMBL
2	Are <b>emergency contact telephone numbers</b> (fire, etc.) posted on or near the telephone?					CDC/BMBL
3	Are <b>eyewash and shower facilities</b> available and unobstructed?					CDC/BMBL
4	Are <b>eyewash</b> stations <b>flushed</b> weekly?					CDC/BMBL
5	Is an emergency warning system, including a <b>fire alarm</b> , available in the event of an incident?					CDC/BMBL
6	Are <b>emergency procedures</b> and <b>evacuation routes</b> known by all employees?					CDC/BMBL
7	Are <b>fire extinguishers</b> immediately accessible, and do all employees know their location?					CDC/BMBL
8	Are <b>emergency exits</b> clearly marked, free from obstruction, and unlocked?					CDC/BMBL
<b>F. Personal Protective Equipment</b>						
1	Are <b>GLOVES</b> used in the laboratory? If so, circle types of gloves used <b>Latex</b> : biohazard, acid; <b>Nitrile</b> : biohazard, solvent; <b>Butyl</b> : solvent; <b>PVA</b> : solvent; <b>Neoprene</b> : solvent; <b>PVC</b> : solvent; <b>Insulated</b> : hot or cold surfaces					CDC/BMBL
2	Do employees <b>wear eye/face protection</b> during laboratory operations? If so, circle type used. <b>Safety</b> : impact, UV, laser; <b>Goggles</b> : chemicals; <b>Full-face shield</b> : hazardous chemicals, biohazard splash, UV					CDC/BMBL
3	Are <b>Lab Coats</b> worn in the laboratory, removed before exiting the laboratory, and not worn in non-laboratory areas?					CDC/BMBL
4	Do all employees in the laboratory wear <b>close-toed shoes</b> ?					CDC/BMBL
5	Are employees instructed in proper first-aid & other emergency procedures?					CDC/BMBL
<b>G. Radiation Safety</b>						
1	Are radioactive isotopes used in this laboratory? If so, list isotopes in comments.					CDC/BMBL
2	Do only authorized users handle radioactive compounds?					CDC/BMBL
3	Do personnel conduct required periodic radiation monitoring?					CDC/BMBL
4	Do authorized users wear personal monitoring devices (badges)?					CDC/BMBL

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5	Have personnel been trained in radioactive materials spill control/clean-up procedures?					CDC/BMBL
6	Have personnel been trained in radioactive waste disposal procedures?					CDC/BMBL
<b>H. Compressed Gas Cylinders</b>						
1	Are compressed gases used in this laboratory? If so, list gases in comments.					CDC/BMBL
2	Are tanks properly identified?					CDC/BMBL
3	Are all gas cylinders secured to prevent falling?					CDC/BMBL
4	Are empty gas cylinders labeled Empty or MT?					CDC/BMBL
5	When gas cylinders are not in use, is the valve cap securely in place to protect the valve stem and valve?					CDC/BMBL
6	Is a non-adjustable cylinder wrench available for connecting and disconnecting gas cylinders?					CDC/BMBL
7	Have personnel required to move, disconnect, and connect compressed gas cylinders been formally trained to do so? ( <i>Compressed Gas Association</i> requirement.)					CDC/BMBL
<b>I. Electrical Safety</b>						
1	Have you experienced any electrical problems in your laboratory? If so, explain in comments.					CDC/BMBL
2	Does high-voltage equipment have proper labels warning of the hazard?					CDC/BMBL
3	Are cords and plugs regularly inspected for wear and fraying, and repaired when necessary?					CDC/BMBL
4	Are electrical cords run from equipment to outlets so as to prevent trip/safety hazards?					CDC/BMBL
6	Is access to electrical panels unobstructed? (36-inch clearance is required)					CDC/BMBL
7	Are all circuit breaker boxes appropriately labeled?					CDC/BMBL
<b>J. Hazardous Materials and Chemical Management</b>						
1	Do employees have access to the Chemical Hygiene Plan, and is there evidence that they have read it?					
2	Is a current inventory of hazardous chemicals used within the laboratory available?					CDC/BMBL
3	Are hard copies and/or electronic access of manufacturer Material Safety Data Sheets (MSDS) for hazardous chemicals readily available to all employees at all times?					CDC/BMBL

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4	Is there a written protocol for chemical spills available and have all employees reviewed it?					CDC/BMBL
5	Is a certified, ventilated chemical fume hood available for use with volatile chemicals?					CDC/BMBL
6	Are chemical storage containers inspected periodically for rust, corrosion, or leakage?					CDC/BMBL
7	Are containers of hazardous or frequently used chemicals stored below eye level?					CDC/BMBL
8	Are reagent bottles or containers kept from protruding over shelf edges?					CDC/BMBL
9	Are containers of corrosive chemicals stored in trays or cabinets large enough to contain spillage or leakage?					CDC/BMBL
10	Are chemical storage cabinets with highly volatile or odorous compounds ventilated?					CDC/BMBL
11	Are NFPA-approved safety cabinets used for storage of flammable liquids? (These may be metal or wooden, as long as they meet NFPA and OSHA design standards.)					CDC/BMBL
12	Are chemicals stored compatibly by reactive class (e.g., flammables with flammables, oxidizers with oxidizers)? (Refer to <i>Chemical Handling Guidelines</i> , NCID 2002 Chemical Hygiene Plan)					CDC/BMBL
13	Are only laboratory-approved (intrinsically safe) refrigerators used for storing volatile flammable liquids?					CDC/BMBL
14	Are peroxide-forming chemicals (ethers, selected hydrocarbon solvents) stored in airtight containers in a dark, cool, and dry place, and properly discarded before date of expected peroxide formation?					CDC/BMBL
15	Are NFPA hazard labels and identification system used for labeling all dangerous chemicals?					CDC/BMBL
16	Are all containers clearly labeled as to their contents and labels are firmly attached to containers?					CDC/BMBL
17	Are all containers/samples stored in refrigerators/freezers properly labeled ?					CDC/BMBL
18	Do all container labels include date of receipt?					CDC/BMBL
19	Are hoods neat, free of junk, and is there plenty of workspace? If asbestos lined, is the lining flaking?					CDC/BMBL



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<b>G. Training and Safety References</b>						
1	Personnel have been trained in the procedures to be used and the training is documented					
2	Emergency procedures are in writing and understood by all					
3	All rDNA projects are registered with the IBRDSC					
4	A copy of the NIH Guidelines for Research involving Recombinant DNA Molecules is available in the lab					
<b>H. Reviewer's Summary</b>						
a	Summarize review findings below					
b	Indicate final disposition or recommendations below:					

Biological Safety Coordinator: \_\_\_\_\_ Date: \_\_\_\_\_

Principle Investigator/Instructor/Lab Director \_\_\_\_\_ Date: \_\_\_\_\_