

# Biosafety Level 2 Laboratory Biosafety Compliance Inspection Checklist

Biosafety Level 2 Section of the *Biological Safety in Microbiological Biomedical and Laboratories, 5<sup>th</sup> edition*.

**Biosafety Level 2** builds upon BSL-1. BSL-2 is suitable for work involving agents that pose moderate hazards to personnel and the environment. It differs from BSL-1 in that

- 1) Laboratory personnel have specific training in handling pathogenic agents and are supervised by scientists competent in handling infectious agents and associated procedures
- 2) Access to the laboratory is restricted when work is being conducted
- 3) All procedures in which infectious aerosols or splashes may be created are conducted in BSCs or other physical containment equipment.

The following standard and special practices, safety equipment, and facility requirements apply to BSL-2 laboratories.

<b>Date</b>	<b>Laboratory Location</b>
<b>IBC Protocol #</b>	<b>Responsible Individual</b>
<b>Person Interviewed:</b>	

**Biological safety level:** BSL-1  BSL-2  BSL-3

**Biological materials manipulated in the laboratory:** Bacteria  Virus  Protozoan

Cell lines  Human derived materials  Biologically active toxins  Animals  Species

Other potentially infectious materials  Fungi

<b>Organism / Material</b>	
<b>Organism / Material</b>	
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<b>Organism / Material</b>	

<b>A. Standard Microbiological Procedures</b>		Yes	No	NA
Check the response that best describes the laboratory in which work will be performed. NA = not applicable				
1.	The laboratory supervisor must enforce the institutional policies that control access to the laboratory.			
2.	Persons must wash their hands after working with potentially hazardous materials and before leaving the laboratory.			
	a. Soap & paper towels available or similar for hand washing			
3.	Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption must not be permitted in laboratory areas. Food must be stored outside the laboratory area in cabinets or refrigerators designated and used for this purpose.			

4.	Mouth pipetting is prohibited; mechanical pipetting devices must be used.			
5.	Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented. Whenever practical, laboratory supervisors should adopt improved engineering and work practice controls that reduce risk of sharps injuries. Precautions, including those listed below, must always be taken with sharp items. These include:			
a.	Careful management of needles and other sharps are of primary importance. Needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal.			
b.	Used disposable needles and syringes must be carefully placed in conveniently located puncture-resistant containers used for sharps disposal.			
c.	Non-disposable sharps must be placed in a hard walled container for transport to a processing area for decontamination, preferably by autoclaving.			
d.	Broken glassware must not be handled directly. Instead, it must be removed using a brush and dustpan, tongs, or forceps. Plasticware should be substituted for glassware whenever possible.			
6.	Perform all procedures to minimize the creation of splashes and/or aerosols.			
7.	Decontaminate work surfaces after completion of work and after any spill or splash of potentially infectious material with appropriate disinfectant.			
a.	Disinfectant(s) used in the laboratory:			
8.	Decontaminate all cultures, stocks, and other potentially infectious materials before disposal using an effective method. Depending on where the decontamination will be performed, the following methods should be used prior to transport:			
a.	Materials to be decontaminated outside of the immediate laboratory must be placed in a durable, leak proof container and secured for transport.			
	Method of decontamination			
	Method to monitor/verify decontamination			
	Location of decontamination (autoclave location)			
b.	Materials to be removed from the facility for decontamination must be packed in accordance with applicable local, state, and federal regulations.			
	Company contracted for waste disposal:			
9	A sign incorporating the universal biohazard symbol must be posted at the entrance to the laboratory when infectious agents are present. Posted information must include: the laboratory's biosafety level, the supervisor's name (or other responsible personnel), telephone number, and required procedures for entering and exiting the laboratory. Agent information should be posted in accordance with the institutional policy.			
a.	Equipment (freezers, incubators and the like) have proper biohazard signage posted. List equipment:			
10	An effective integrated pest management program is required. See AppendixG of the BMBL			
11	The laboratory supervisor must ensure that laboratory personnel receive appropriate training regarding their duties, the necessary precautions to prevent exposures, and exposure evaluation procedures. Personnel must receive annual updates or additional training when procedural or policy			

changes occur. Personal health status may impact an individual's susceptibility to infection, ability to receive immunizations or prophylactic interventions. Therefore, all laboratory personnel and particularly women of child-bearing age should be provided with information regarding immune competence and conditions that may predispose them to infection. Individuals having these conditions should be encouraged to self-identify to the institution's healthcare provider for appropriate counseling and guidance.			
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<b>B. Special Practices</b>				
Check the response that best describes the laboratory in which work will be performed. NA = not applicable		Yes	No	NA
1.	All persons entering the laboratory must be advised of the potential hazards and meet specific entry/exit requirements.			
2.	Laboratory personnel must be provided medical surveillance and offered appropriate immunizations for agents handled or potentially present in the laboratory.			
3.	When appropriate, a baseline serum sample should be stored.			
4.	A laboratory-specific biosafety manual must be prepared and adopted as policy. The biosafety manual must be available and accessible.			
	Copy of the UMKC Biosafety manual available, 5 <sup>th</sup> ed. BMBL			
	Copy of the NIH Guidelines for recombinant DNA activities available			
5.	The laboratory supervisor must ensure that laboratory personnel demonstrate proficiency in standard and special microbiological practices before working with BSL-2 agents.			
6.	Potentially infectious materials must be placed in a durable, leak proof container during collection, handling, processing, storage, or transport within a facility.			
7.	Laboratory equipment should be routinely decontaminated, as well as, after spills, splashes, or other potential contamination.			
a.	Spills involving infectious materials must be contained, decontaminated, and cleaned up by staff properly trained and equipped to work with infectious material.			
b.	Equipment must be decontaminated before repair, maintenance, or removal from the laboratory.			
8.	Incidents that may result in exposure to infectious materials must be immediately evaluated and treated according to procedures described in the laboratory biosafety manual. All such incidents must be reported to the laboratory supervisor. Medical evaluation, surveillance, and treatment should be provided and appropriate records maintained.			
9.	Animals and plants not associated with the work being performed must not be permitted in the laboratory..			
10.	All procedures involving the manipulation of infectious materials that may generate an aerosol should be conducted within a BSC or other physical containment devices.			

<b>C. Safety Equipment (Primary barriers)</b>				
Check the response that best describes the laboratory in which work will be performed. NA = not applicable		Yes	No	NA
1.	Properly maintained BSCs (preferably Class II), other appropriate personal protective equipment, or other physical containment devices must be used whenever:			
	BSC Type,Class :			
	Last certification:			
	Certification due:			

a.	Procedures with a potential for creating infectious aerosols or splashes are conducted. These may include pipetting, centrifuging, grinding, blending, shaking, mixing, sonicating, opening containers of infectious materials, inoculating animals intranasally, and harvesting infected tissues from animals or eggs.			
b.	High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory using sealed rotor heads or centrifuge safety cups. Centrifuge:			
2.	Protective laboratory coats, gowns, smocks, or uniforms designated for laboratory use must be worn while working with hazardous materials. Remove protective clothing before leaving for non-laboratory areas (e.g., cafeteria, library, administrative offices). Dispose of protective clothing appropriately, or deposit it for laundering by the institution. It is recommended that laboratory clothing not be taken home.			
3.	Eye and face protection (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials when the microorganisms must be handled outside the BSC or containment device. Eye and face protection must be disposed of with other contaminated laboratory waste or decontaminated before reuse. Persons who wear contact lenses in laboratories should also wear eye protection.			
4.	Gloves must be worn to protect hands from exposure to hazardous materials. Glove selection should be based on an appropriate risk assessment. Alternatives to latex gloves should be available. Gloves must not be worn outside the laboratory. In addition, BSL-2 laboratory workers should:			
a.	Change gloves when contaminated, integrity has been compromised, or when otherwise necessary. Wear two pairs of gloves when appropriate.			
b.	Remove gloves and wash hands when work with hazardous materials has been completed and before leaving the laboratory.			
c.	Do not wash or reuse disposable gloves. Dispose of used gloves with other contaminated laboratory waste. Hand washing protocols must be rigorously followed.			
5.	Eye, face and respiratory protection should be used in rooms containing infected animals as determined by the risk assessment.			

#### D. Laboratory Facilities (Secondary barriers)

Check the response that best describes the laboratory in which work will be performed. NA = not applicable		Yes	No	NA
1.	Laboratory doors should be self-closing and have locks in accordance with the institutional policies.			
2.	Laboratories must have a sink for hand washing. The sink may be manually, hands-free, or automatically operated. It should be located near the exit door.			
3.	The laboratory should be designed so that it can be easily cleaned and decontaminated. Carpets and rugs in laboratories are not permitted.			
4.	Laboratory furniture must be capable of supporting anticipated loads and uses. Spaces between benches, cabinets, and equipment should be accessible for cleaning.			
a.	Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.			
b.	Chairs used in laboratory work must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant.			
5.	Laboratory windows that open to the exterior are not recommended. However,			

	if a laboratory does have windows that open to the exterior, they must be fitted with screens.			
6.	BSCs must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. BSCs should be located away from doors, windows that can be opened, heavily traveled laboratory areas, and other possible airflow disruptions..			
7.	Vacuum lines should be protected with High Efficiency Particulate Air (HEPA) filters, or their equivalent. Filters must be replaced as needed. Liquid disinfectant traps may be required.			
8.	An eyewash station must be readily available			
	Safety shower available			
9.	There are no specific requirements on ventilation systems. However, planning of new facilities should consider mechanical ventilation systems that provide an inward flow of air without recirculation to spaces outside of the laboratory.			
10.	HEPA filtered exhaust air from a Class II BSC can be safely re-circulated back into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or a direct (hard) connection. Provisions to assure proper safety cabinet performance and air system operation must be verified.			
11.	A method for decontaminating all laboratory wastes should be available in the facility (e.g., autoclave, chemical disinfection, incineration, or other validated decontamination method).			
12.	The laboratory is equipped with Biological spill kit			
13.	The laboratory is equipped with a general first aid kit			
14.	Emergency contact information is posted near the entrance/exit or by telephones			