

**TABLE 3A
SUMMARY OF BIO SAFETY LEVEL-1 & 2
FOR INFECTIOUS AGENTS**

BSL ⁵	AGENTS PRIMARY	CONTAINMENT ¹		
		CONTAINMENT ²		SECONDARY CONTAINMENT ³
		Microbiology Practices/Technique ⁴	Safety Equipment (primary barriers)	Facilities (secondary barriers)
1	Well-characterized agents not known to consistently cause disease in healthy adults, and of minimal potential hazard to lab personnel and environment Appropriate for undergraduate and secondary educational training and teaching laboratories. Example: <i>Bacillus subtilis</i>	<ol style="list-style-type: none"> 1. Lab personnel have specific training in those procedures conducted in the laboratory 2. Supervised by scientist with general training in microbiology 3. Limited access to lab when experiments are in progress 4. Hand washing after handling cultures and before exiting lab 5. Eating, drinking, applying contact lenses or cosmetics, the storage of food is prohibited 6. Mouth pipetting prohibited 7. "Sharps" policy instituted 8. All procedures minimize the creation of aerosols 9. Work surfaces decontaminated after spills and end of day 10. Waste disposal policy instituted 11. Biohazard sign posted at entrance when infectious agents are present, with name of agent(s) and name/phone# of supervisor 12. Insect/rodent control program in effect 	<p>None required:</p> <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Work performed on open bench top 2. Lab coats, gowns, or uniform to be worn to protect street clothes 3. Gloves should be worn if skin on hands is broken or if rash is present. Alternative to powdered latex gloves should be available 4. Protective eyewear should be worn for procedures in which splash is anticipated. 5. Persons wearing contact lenses should also wear goggles or a face shield 	<p>Sink for hand washing</p> <ol style="list-style-type: none"> 1. The laboratory is not necessarily separated from the general traffic patterns in the building 2. Laboratory should have doors for access control 3. Designed to be cleaned easily. Carpets and rugs are not appropriate 4. Bench tops impervious to water and resistant to moderate heat, organic solvents, acids, alkalis or chemicals used to decontaminate the work surfaces. 5. Furniture can support anticipated loading and uses, with spacing between cabinets, benches, and equipment accessible to cleaning 6. Windows fitted with screens
2	Associated with human disease Example: <i>Bacillus anthracis</i> , <i>Shigella</i> spp, <i>Yersinia pestis</i> . BSL2 recommendations and OSHA requirements focus on the prevention of percutaneous, ingestion and mucous membrane exposure(s) to clinical materials.	<p>BLS-1 practice plus:</p> <ol style="list-style-type: none"> 1. Lab personnel have specific training in handling pathogenic agents and are directed by competent scientists 2. Policy/procedures where by only persons meeting specific entry/training requirements may enter laboratory 3. Individuals at increased risk of acquiring infection are limited/restricted from the laboratory area 3. Biohazard sign (as above, plus): biosafety level, required immunization, required personal protective equipment, & any procedures required for exiting lab 4. Immunizations or tests provided for agents in laboratory (hepatitis B vaccine/TB skin testing) 5. Personnel receive appropriate training in safety precautions, exposure prevention, "sharps" precautions, and annual updates for procedure/policy changes 6. Biosafety manual defining infectious waste handling/ decontamination and medical surveillance policies 7. Decontamination policy for work surfaces, spills, and contaminated equipment. 8. An accident policy involving an accidental/over exposure to infectious materials that requires immediate reporting to lab director for documentation/medical evaluation/surveillance/ and necessary treatment. 	<ol style="list-style-type: none"> 1. Properly maintained Biological Safety Cabinet (BSC)=Class I or II (preferable Class II) for all manipulations involving splashes or aerosols of infectious materials. 2. Personal protective equipment (PPE's): a. Protective laboratory clothing. This clothing is removed and left in the lab area before leaving for non-laboratory areas. It is either disposable or laundered by the institution; it should never be taken home. b. Gloves are worn when hands may contact potentially infectious materials, surfaces or equipment. Disposable gloves are not to be re-used, washed or used to touch "clean" surfaces (telephones, etc). Hands are washed following glove removal c. Face protection (goggles, mask, face shield or splatter guard) is used for anticipated splashes or sprays of hazardous materials for manipulations outside the BSC 	<p>BLS-1 plus:</p> <ol style="list-style-type: none"> 1. Autoclave available 2. Provide lockable doors for facilities that house restricted agents 3. Laboratory is separated from general traffic patterns and away from public areas. 4. Recommended that sinks for hand washing be equipped with foot, knee, or automatic faucet operation 5. Locate BSC for optimal operation to maintain parameters for containment 6. Eyewash station is readily available

1. A term used to describe safe methods for managing infectious materials in the laboratory environment; its purpose, is to reduce or eliminate exposure of laboratory workers, other persons, and the outside environment to potentially hazardous agents.

2. The protection of personnel and the immediate laboratory environment from exposure to infectious agents.

3. The protection of the environment external to the laboratory from exposure to infectious materials, provided by facility design and operational practices.

4. **The MOST important element of containment, i.e., strict adherence to standard microbiological practices and techniques.**

5. Risk assessment factors, such as, pathogenicity, route of transmission, agent stability, infectious dose, organism concentration, specimen origin, animal study data, availability of prophylaxis, medical surveillance, and technical proficiency are but a number of elements that contribute to the establishment of a given biosafety level.