Safety and Rules

Using Microorganisms:

These experiments can involve risks. Teachers and supervisors are fully responsible for teaching students' proper safety rules and sterile techniques.

Roles and Responsibilities:

The instructor works with the student to evaluate any potential risks, ensuring the health and safety of both the student and any living subjects involved in the study.

Main Rules:

1. Act responsibly & be careful, so everyone Is Responsible!
3. Food, drink, smoke and gum are not allowed in the microbiology lab.
4. Follow instructions.
5. Clean up carefully and thoroughly.
6. Wear correct clothing & safety equipment.
7. Wear gloves, aprons or lab coats when working with corrosive or staining chemicals. goggles is optional and tie hair back.
8. Never wear open shoes or sandals when using sharp instruments or hazardous chemicals.
9. Do not handle organisms without approval and supervision of your instructor.
10. Wash hands thoroughly with soap and water after any activity involving animals and/or animal parts, plants and/or plant parts, soil, and other organic material.

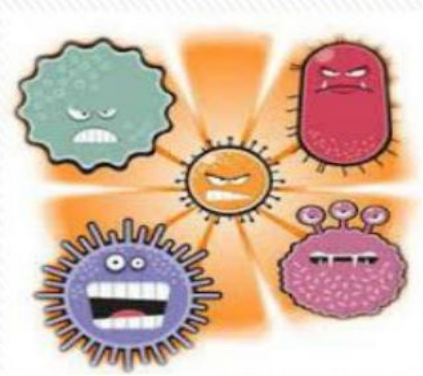


11. Notify supervisor immediately of any accidents or unsafe conditions in the microbiology lab!
12. Don't use your Mobile, Medical devices, Chemicals and Writing With gloves
13. Always follow the teacher's directions and only do lab work when a teacher is present. You MUST get permission from the teacher before beginning ANY activity or using any tools.

Microbiology Laboratory Lab1

Safety Precautions:

Medical laboratories handle a large volume of pathological specimens and various bodily fluids, most notably blood. Because of this environment and the inherent risk of cross-contamination, strict attention must be dedicated to maintaining an antiseptic workspace. Routine and regular sterilization of all equipment is required to ensure procedural safety and reliability.



Biohazards: encompass biological agents or materials that pose a threat to human health. In the laboratory setting, these include:

- Bacteria
- Viruses
- Fungi
- Parasites
- Any human body fluids

Pathogens: Biological agents that cause disease

Bloodborne Pathogens: Microorganisms that can be transmitted through direct contact with contaminated blood, bodily fluids, or tissues.

The Golden Rule of Laboratory Safety:

"Treat all human blood and bodily fluids as if they are infected"



In an Emergency! In the lab, it is important to know the location of:

- Fire Blanket
- Fire Extinguisher
- Emergency Exits
- Safety Shower and Eye Wash

What are the hazards?

1- The pathogenicity of an organisms

2- Toxicity: Toxicity means poisoning.

3- Allergenicity: Allergenicity is a non-toxic, immune system mediated, undesired reaction of the body to a substance or agent.

4- Ecological Disruption: Occurs if genetically modified organisms (GMOs) accidentally escape into the environment or if their genetic material transfers to other native organisms.

5- Other Risks: Unpredictable side effects can happen, so you always need to be extra careful with biological materials because we cannot predict every single danger.

Biological waste: Biological waste must be disposed of an important distinction should be made between biological waste that has been inactivated before disposal, and biological waste that has not been inactivated before disposal. The latter has to be treated as hazardous medical waste and should be transported to an incinerator that is suited for the incineration of hazardous medical waste.

Biological waste includes:

• All genetically modified and/or pathogenic biological material: cell cultures, cultures of Microorganisms, tissues, blood, etc.

• Typical laboratory waste of organic origin: gels, etc.

• All kinds of biologically contaminated material: gloves, paper tissues, disposable culture flasks, pipettes, etc.

• Materials that are not necessarily contaminated, but cannot be thrown into an ordinary waste disposal bag because they have sharp edges or look dirty (bones, blood, etc.).

Biological waste does not include:

• Radioactive contaminated material. Such material should be dealt with separately.

What Are BSL Laboratories?

A Biosafety Level (BSL) laboratory is a controlled workspace designed for handling microorganisms that are not known to consistently cause disease in healthy humans. These agents are typically non-pathogenic or present minimal hazards.

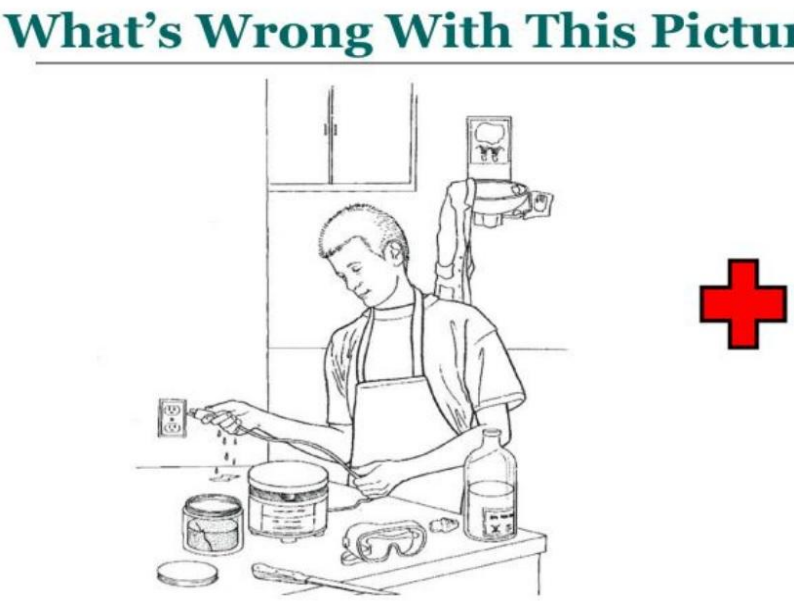
Why Are BSL-1 Labs Important?

➤ They introduce students to microbiological practices in a real lab setting.

➤ They provide the foundation for future work in higher-level biosafety labs (BSL-2, BSL-3, and BSL-4).

➤ In education and industry, they're used for training, basic research, and quality control tests.

Personal Protective Equipment (PPE)



- **Wet, Damaged Electrical Cord:** The student is holding an electrical cord near a power outlet with water dripping from it. The cord also appears frayed or damaged near the plug, creating a severe electrocution hazard.
- **Not Wearing Safety Goggles:** Protective goggles are lying on the lab bench instead of being worn over the eyes, despite the presence of chemicals and liquids.
- **Broken Glassware:** There is a glass jar or beaker with a visible crack on the left side of the bench, posing a significant risk of cuts or chemical spills.
- **Unsafe Use of Sharp Tools:** A knife or sharp tool is left lying openly on the edge of the bench in an unorganized manner, which could lead to accidental injury.



- **No Safety Goggles:** Neither student is wearing protective eyewear, despite the presence of chemicals and a flame.
- **Unsafe Chemical Handling (Right Student):** The student on the right is holding a test tube directly over a lit Bunsen burner with his bare hand. He should be using a test tube clamp or tongs.
- **Poor Posture (Left Student):** The student on the left is leaning in very close to the glassware. This can lead to inhaling fumes or getting chemicals on her face.
- **Cluttered Bench:** The notebook, papers, and other loose items are creating a cluttered workspace, which increases the risk of accidents and spills.



- **Eating or Drinking in the Lab :**The student on the left is holding a soda can, and another can is sitting on the lab bench, which is strictly prohibited due to the risk of chemical or biological contamination.
- **Incorrect Inhalation Technique / Sniffing Directly**: The student on the right is sniffing the container directly close to her face instead of using the safe "wafting" technique.
- **Cluttered Lab Bench :**There are scattered papers and crumpled trash on the workbench near electrical equipment, increasing accident risks .