

**Microbiology Lab Practices and Safety Rules**

1. Laboratory coats must be worn and buttoned while in the laboratory.
2. Wash your hands with disinfectant soap when you arrive at the lab and again before you leave.
3. Absolutely no food, drinks, chewing gum is allowed in the laboratory. Do not put anything in your mouth such as pencils. Do not use laboratory glassware as containers and do not store food in areas where microorganisms are stored.
4. Avoid loose fitting items of clothing. Wear appropriate shoes (sandals are not allowed) in the laboratory.
5. Disinfect work areas before and after use with 70% ethanol or fresh 10% bleach. Laboratory equipment and work surfaces should be decontaminated with an appropriate disinfectant on a routine basis, and especially after spills, splashes, or other contamination.
6. Sterilize equipment and materials.
7. Label everything clearly.
8. Replace caps on reagents, solution bottles, and bacterial cultures. Do not open Petri dishes in the lab unless absolutely necessary.
9. Inoculating loops and needles should be flame sterilized in a Bunsen burner before you lay them.
10. Turn off Bunsen burners when not in use. Long hair must be restrained if Bunsen burners are in use.
11. Treat all microorganisms as potential pathogens. Use appropriate care and do not take cultures out of the laboratory.
12. Wear disposable gloves when working with potentially infectious microbes or samples (e.g. sewage). If you are working with a sample that may contain a pathogen, then be extremely careful to use good bacteriological technique.
13. Never pipette by mouth. Use a pipetting aid or adjustable volume pipettors.
14. Consider everything a biohazard. Do not pour anything down the sink. Autoclave liquids broth cultures to sterilize them before discarding.
15. Dispose of all solid waste material in a biohazard bag and autoclave it before discarding in the regular trash.
16. Dispose of broken glass in the broken glass container.
17. Report spills and accidents immediately to your instructor. Clean small spills with care.

**The instruments and tools used in microbiology lab.**

1. **Loop, Needle (wire/plastic):** Routine inoculation of agar slopes and making streak plates.
2. **Spreader (glass/plastic):** Making lawn/spread plates
3. **Forceps (metal/plastic):** Transfer of antibiotic discs; also plant material, e.g. root with nodules
4. **Pipette (glass/ plastic):** Transfer of measured volumes/drops of culture/sterile solutions.
5. **Test tube (and their racks):** putting liquid media/agar slopes/sterile solutions for inoculation.
6. **Conical flask:** Large volumes of liquid media for inoculation and liquid/media for short-term storage.
7. **Petri dish (plastic/ glass):** pre-sterilized for streak/spread/ pour plates.
8. **Marker pen:** Labeling Petri dishes, test tubes, flasks, bottles and microscope slides.
9. **Bunsen burner:** Sterilization of wire loops and (with alcohol) metal forceps and glass spreaders
10. **Autoclave/pressure cooker:** Sterilization of media, solutions and equipment before use.
11. **Hot air oven:** Sterilization of glass Petri dishes and pipettes.
12. **Refrigerator:** Storage.
13. **Incubator/ Shaker Incubator:** Incubation of cultures.
14. **Water bath:** Suitable temperature for keeping melted agar media.
15. **Thermometer:** Checking incubator/water bath temperatures.
16. **pH meter:** Checking and adjusting pH values of media.
17. **Microscope, slides, cover, stains, slide staining rack, immersion oil:** Microscopical observations.
18. **Balance:** balancing culture media.
19. **Microwave:** melting solidified agar media for use.
20. **Gas-pak**
21. **Spectrophotometer:** Reading absorbance, transmission and concentration of different samples.
22. **Centrifuge:** Concentrating of samples and collecting of precipitates.
23. **Hood:** A sterile chamber for transferring and sub-culturing of microorganism.

**Why we use mineral or cedar oil in case of using the oil lens for examining the bacterial specimens?**