

# **SAFETY PROCEDURES**

## **MICROBIOLOGY LABORATORY (BIO310L)**

There are two main objectives to the *special* procedures employed in microbiology laboratories:

(a) to prevent contamination, i.e. the introduction of unwanted organisms into the cultures and supplies being used; and,

(b) to protect those people working in the lab---you, your colleagues, the instructors, maintenance personnel, etc.---from possible infection by an organism.

The microorganisms you will be working with are usually not highly virulent, but *all* microorganisms are potential pathogens and should be treated with respect. It is wise to develop careful habits no matter what the organism. The following guidelines should help you meet this goal.

Additional safety procedures address the fact that we are using chemicals, glassware, heat and flame.

### ***PERSONAL BEHAVIOR, ATTIRE, POSSESSIONS & RISK FACTORS***

1. Concentrate on your lab work. Conversations not relevant to the work you are doing must be kept to a minimum. Cell phones, texting, etc., are not permitted.

If you use electronics to take pictures of results, you must have the device covered with a sealed plastic bag. That bag should be discarded when you leave the room. If we know the device is contaminated, it will need to be decontaminated which will likely destroy it (no matter what its cost). If you unknowingly get it contaminated, you run the risk of exposing your face and mouth to the microbe. Best advice: don't use your electronics in lab. Instead record results the old-fashioned way.

2. Do not eat, drink, or chew gum in the lab. Containers of food or beverage must be secured within your book bag before you enter the lab and not placed on the counter or on the floor outside the laboratory entrance.
3. Do not apply make-up or smoke in lab. Pencils, pens, labels, fingers, or other objects should never be placed in your mouth while in lab. Keep your hands away from your face.
4. A lab coat is required to protect you and your clothing from accidental spills of cultures, stains and chemicals. Preferably, this clothing should be worn in and not removed from the laboratory. However, if it is carried out of the lab, it should be kept in a plastic zipper bag. Lab coats should be laundered separately, using bleach in addition to detergent.
5. Come to the laboratory properly dressed---never with bare feet, "flip-flops," unstable high heels or loose clothing. Acceptable shoes are closed toe with no perforations. Long hair must be tied back so it does not catch fire in a burner or fall into sterile media or culture media. False fingernails ignite easily and should never be worn in lab. Hair spray is highly flammable! Loose sleeves/clothing must be restrained under your lab coat.

## MICROBIOLOGY LAB SAFETY

6. Books, purses, coats, etc., not in use must be placed out of the way---not on the lab bench, shelf above the bench, or side benches. You should use the large cupboard under your bench for all items not in use in the lab.
7. Working in the lab in the evenings and on weekends will be limited to those times when the instructor is present in the building or when special arrangements have been made. Under no condition may a student work in lab at night or on weekends unless the instructor opens the lab for this purpose. Students performing lab procedures should not work alone in the laboratory.
8. Contact lens wearers should consult their ophthalmologist or optometrist for instructions. [CDC guidelines require anyone wearing contact lenses to wear goggles or a face shield.] Be aware that trace amounts of stains on fingers can be transferred to soft lenses & that soft lenses absorb chemicals, including vapors. Be especially careful to follow sterilization procedures recommended.
9. Fabrics, especially cotton, can burn if exposed to the heat of flame. Fabrics with a fuzzy surface or open weave are more easily ignited. Use of fabric softeners increases the flammability of such fabrics. Therefore, choose your lab attire carefully, even that which is under a lab coat.
10. Clothing worn in the microbiology laboratory should not be subsequently worn in a facility where there are compromised hosts, such as a hospital, clinic or nursing home. It should also not be worn in an area of public food preparation.
11. Safety goggles should be worn for certain procedures, specifically those involving handling of hot liquids (e.g. boiling agar), caustic chemicals or heated slides. [See the note above re: contact lenses.] Obviously, goggles can't be worn when you are doing microscopy.
12. Children, unless permission has been granted, or pets are not allowed in the laboratory.
13. Students at high-risk for infection (e.g. persons with uncontrolled diabetes, those with a suppressed immune system, someone on steroids or chemotherapy), or those in whom an infection could be especially devastating (e.g. severely impaired kidneys) should (a) preferably notify the instructor, and (b) seek and receive permission of their physician. Students with potential life-threatening chemical sensitivities or medical conditions are required by the SSM policy to wear MedicAlert identification.

## ***YOUR WORK AREA***

14. Wipe off the counter with disinfectant before and after your lab work, always. A surface should also be decontaminated at any other time you feel it may have become contaminated.
15. All reagents, dyes and stains, cultures, equipment and lab benches must be returned to the proper place at the end of each lab period. However, during lab, you should place the tray of stains *on* your bench (not on the shelf) to avoid reaching over the flames.
16. Work over the lab bench, not over the floor or your lap.

## MICROBIOLOGY LAB SAFETY

17. Equipment, including storage racks, which contains cultures should be handled in a safe manner, so as to minimize the chance of accidents.
18. Several areas of the laboratory are "off-limits" unless you have the specific permission of the instructor. These include the drawers, cupboards, and supplies in the Prep Lab, the refrigerators, and the shelves labeled with the instructor's name in the walk-in incubator.
19. Turn the gas burner down or off when it is not in use during the lab period. Double check to be sure the gas is turned off at the end of the lab period.  
Always turns the burner off at the gas jet; never turn it off at the burner.  
Do not push the burner under the shelf or over the red line.  
Avoid reaching over a lit burner.  
In the event of a power outage, be sure your gas jet is off. When power is restored, the gas will come on.  
If gas burns from a leak in the burner or tubing, turn off the gas.

### ***OOPS!***

20. Keep cuts, open wounds or rashes covered. Report any injuries, no matter how minor, incurred in lab to the instructor.
21. Avoid spilling cultures!!! But, if you accidentally spill a culture on yourself, the bench, the floor, or elsewhere:
  - (a) always notify the instructor;
  - (b) wear gloves for the clean-up;
  - (c) place paper toweling on the spill to absorb it;
  - (d) never touch broken glassware with your fingers;
  - (e) without letting your hands touch the absorbed liquid, place the paper towel in the proper container for sterilization (not in the waste basket);
  - (f) disinfect the area thoroughly with disinfectant. This includes letting the disinfectant stay on the spill area for at least ten minutes.
  - (g) Discard the gloves. Wash your hands with disinfectant and soap. Do not touch anything else, including water faucets, with your contaminated hands. [Ask someone to turn the water on for you.]Remember to not spread contamination. For example, don't place a tube with culture spilled on the outside back in a rack where it could contaminate the rack and the hands of the next person.
22. Spills of reagents and stains should be cleaned using paper towels, followed by a thorough rinsing with water. For large spills or spills with hazardous liquids, notify the instructor.
23. Broken glass, if uncontaminated, should be placed in the container labeled "broken glass" in the Prep Lab. If it is contaminated, it should be safely contained before autoclaving.
24. Know where the First Aid Kit is and what to do in case of fire.

**STANDARD PRACTICES**

25. Before coming to lab, read each exercise and familiarize yourself with the principles, methods, and specific safety precautions. By doing so, you will lessen the chances of an accident and enable you to use your time more efficiently.
26. All cultures in the incubators or refrigerator must be labeled, with your name (no initials), identity of culture, and date. Include additional information as needed. Label tubes and plates before inoculating them to help avoid confusion and spills.
27. Learn and practice the proper procedure for flaming an inoculating loop or needle. Begin flaming at the handle end and move slowly toward the loop. Flame completely; reduce aerosol production.
28. Do not mouth pipette. Pipette bulbs and manual pipettors are provided for your use.
29. Pick up test tubes by the glass tube, not by the cap, to avoid dropping the tube. Don't tilt test tubes beyond a 45° angle. The plastic caps do not prevent leakage.
30. Cultures are never to be taken from the laboratory.
31. Wash your hands before leaving lab at any time. Also wash your hands after cleaning up spills or anytime you suspect they may have become contaminated. Since bar soaps may become contaminated, you should use liquid or powder soap.
32. Dispose of all cultures, glassware, plastic-ware, pipettes and other supplies in the manner described by your instructor. **There is usually a special container (labeled) for almost every type of item.**
  - An area in the back of the lab has been set aside for contaminated tubes and plates.
    - Tubes should be sorted as directed and placed upright in racks. Care should be taken that nothing can spill. Supplies and media which have been used for culturing bacteria, fungi or viruses must be autoclaved before discarding or washing. Only supplies and equipment which have not been in direct contact with bacteria and fungi can be washed and stored without sterilization.
    - Tape should be removed before placing materials in the discard area

**SUMMARY**

33. Use common sense and good safety practices in everything you do in lab, whether it is specifically stated here or not.
34. Each student must become familiar with all safety rules and must abide by them to remain in the laboratory. Listed below are additional specific safety hazards.

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***SALIVA, BLOOD, TEARS, URINE & OTHER BODILY SECRETIONS & EXCRETIONS***

It is highly unlikely we will work with any of these fluids. However, if we do:

- a. Work only with your own body fluids.
- b. Wear gloves and safety goggles.
- c. Discard all contaminated items in specially designated containers and heed any precautions named by the instructor.
- d. Wash hands immediately if contaminated with blood or other fluids and always at the end of a procedure.
- e. Follow above guidelines for safe handling of microorganisms.

***FIRST AID***

- a. For serious injuries, notify Public Safety to reach our campus emergency responders  
If using campus phone, call: 3-5611 for an emergency  
If using cell phone, call: (843) 953-5611 for an emergency
- b. Report all accidents, no matter how small, immediately to the instructor.
- c. For spills in or near the eyes, use the eyewash.
- d. For large spills on your person, use the sink and drench hose.
- e. For heat burns, the affected part should be chilled with ice as soon as possible and kept chilled, but the ice should not be placed directly on the skin.

***FIRE***

Your response to a fire will differ depending on how large the fire is, the substance which is burning, and immediate danger to persons. Not all eventualities can be listed here.

- a. If gas burns from a leak in the burner or tubing, turn off the gas.
- b. If you have a smoldering sleeve, run water on the fabric.
- c. If you have a very small fire, the best way to put it out is to smother it with a towel or book (not your hand) or the fire blanket. Smother the fire quickly. In some cases (e.g. burning paper or wood), water may be appropriate. Smother an alcohol fire.
- d. If a larger fire occurs, such as in a waste basket or sink, use a fire extinguisher.
- e. If a person is on fire, use the fire blanket.
- f. In case of a large fire involving the lab itself (or a fire alarm), the room and building should be evacuated:

## MICROBIOLOGY LAB SAFETY

To evacuate:

1. Turn off all gas burners and unplug accessible electrical equipment.
2. Leave the room in an orderly manner, proceed down the stairs (either next to Room 200-to left when you leave our lab) or across from Rooms 203-204-to right), and immediately exit the building. Move away from the building.
3. **In the event of a fire or other reason the building must be evacuated, please assemble outside the building at a designated location so that your instructor can take roll to determine if anyone is still in the building. This class will congregate \_\_\_\_\_ Please do not wander off.**

### ***NATURAL DISASTERS***

Hurricane: In the likelihood of a hurricane, you may be asked by your instructor to assist in securing the lab to lessen the risk of cultures being spread and minimize damage to equipment and supplies caused by wind and rain if a window breaks and the inevitable leaky ceilings.

Earthquake: Turn off your gas jet and get under your lab desk during the temblor.

### ***OTHER EMERGENCIES***

Information and directions will be issued by the campus via several conduits, including Cougar Alert, e-mail, and postings.

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