



COMMUNITY
COLLEGE

OF RHODE ISLAND

Community College of Rhode Island
Biology Department
Laboratory Safety Guidelines
Student Expectations for Course Enrollment

Section I - CCRI Laboratory Policies and Safety Guidelines

Laboratory safety is always expected when you are present in a lab. Simple and small mistakes can have catastrophic consequences, so it is imperative that you read, understand, and follow all the guidelines set forth. Laboratory safety is an actual SKILL that you will leave this course with – potential employers expect that you will have basic training in safety. Laboratory safety is not only important for yourself, but your classmates as well. Some classmates may be pregnant, have allergies, or immunocompromised in some manner; it is imperative that you follow all rules to protect everyone.

Lab partner and group work expectations:

Collaborating with other students is an impactful active learning technique that will help you grow as a student. Participating in group work is imperative to the laboratory experience, as you will be separated into groups of four at your work bench. There are certain expectations for participating and working cooperatively with your lab partners. Please adhere to the following:

- Always treat others and their scientific ideas with respect and tolerance (even if you disagree)
- Take responsibility for your own actions and duties
- Be confident to ask questions when you don't know the answer
- Help others with reasonable tasks when asked
- Participation is an important part of the learning process. Be sure to actively participate each lab.
- Follow the safety guidelines to ensure safety for yourself and your lab partners

There will only be 4 students permitted at each lab bench. Safety requirements of this lab do not allow for more than 24 registered students. Additionally, students will not be permitted to sit at the ends of the lab benches and block access for walking.

The following are important safety policies and general laboratory guidelines:

Lab admittance.

- Only exit and enter through the designated lab doors per your instructor.
- Access to the lab is restricted to only those students registered in the course. No casual visitors or children are allowed in the lab areas.
- Students are NOT allowed in the lab prep rooms.
- Never work alone in the lab. Additionally, an instructor MUST be present at all times when you are in the lab.
- Before lab starts be sure to wipe down lab tables and wash your hands.
- Any students that is suspected of being under the influence of drugs or alcohol will not be allowed into the lab.
- Immediately place all bags in the designated area instructed; this may include the coat hooks, back of the room, etc. Bags should not be under your desks.

Lab doors.

- Doors must remain closed at all times.
- The ventilation hoods that are in use require a negative pressure in order to work, and this is dependent on the doors remaining closed.

Lab partners.

- It is very important that you establish laboratory partners in the lab. Not only will you essentially look out for each other's safety, it is also one of a CCRI's definitions of an educated person upon graduation (teamwork).

Personal Protective Equipment (PPEs).

- Shoes that cover the top of your feet must be worn at all times. This is to protect you from any accidental dropping of objects or cultures that could result in serious injury. Chemical spills and the danger of cuts from broken glass is always a possibility in the lab.
- No midriffs or crop tops are permitted to be worn in lab. No low-cut shirts.
- Clothing that covers your entire leg when sitting must be worn at all times. No holes in your pants will be allowed (no rips in jeans). All skin except face and arms must be covered; tank tops are not allowed.
- It is recommended that lab coats are worn in the laboratory at all times. Lab coats can protect a student from the chemicals that they are working with, but should not be worn out of lab.
- You may be required to wear gloves when performing laboratory experiments. These gloves will protect your hands from spills and contamination. This is especially important if you have any open wounds.
- You should never leave lab wearing gloves; additionally, once gloves are removed, they should never be put back on.
- Safety glasses must be worn for all labs involving hazardous chemicals. Safety goggles may be required for certain experiments. This is especially important when performing an experiment that has a potential splash hazard. Also, when working with ultraviolet lights in the laboratory they should be worn as they protect the eyes from any UV rays that may reflect.
- Long hair must be tied back in lab.
- No application of cosmetics in the lab.
- Acrylic nails are flammable and are considered a fire hazard in the lab.
- Dangling bracelets should not be worn on lab day as they are a source of contamination.
- Eating, drinking, and gum chewing are NOT permitted in lab
- Cell phone usage is sometimes permitted; however, cell phones MUST be kept in a Ziploc bag that is to be disposed in the proper receptacle at the end of the laboratory period.

Safety equipment.

- Become familiar with the location and proper use of emergency showers, emergency eye wash, class A/BV/C fire extinguishers, fire blanket and supplies. DO NOT hesitate to use these as necessary.

- First aid kits are present in each lab. Become familiar with their location. Report ALL accidents/incidents immediately to your instructor. A report may be filed with CCRI's Environmental Health and Safety Committee (EHS).

Fire Procedures.

- In the event of a fire, alert your instructor immediately.
- Have a designated person proceed to the laboratory phone to call 911.
- If a person is on fire, immediately rush them to the shower, then after they are extinguished put the fire blanket over them.
- All other students exit immediately.

Movement around the laboratory.

- Use test tube racks when transporting test tubes around the lab.
- When transporting slides that may have stains applied, always hold a paper towel underneath to avoid spills on the floor
- Any spills on the floor must be cleaned immediately and reported; slips and falls are a common occurrence in the lab.
- Keep the laboratory tables free from books, coats, and other extraneous material. Hooks for coats are located at the entrance to lab. Be sure that **ALL** book bags and purses are stored in a designated area free of splash zone.
- No students are allowed in the lab prep rooms; the **ONLY** exception is when there is an emergency and you must use the lab phone for dialing.
- No students are allowed into the cabinets or drawers unless instructed.

Fluids.

- Do not ingest any reagents, carry reagent bottles around the room, or pipette by mouth.
- Clean up spills immediately and wash any reagents off that may have spilled on you. Rinse out your mouth if you accidentally get any reagents in your mouth. Inform the instructor if any of the above happens.
- In experiments dealing with bodily fluids or samples, handle only your own to avoid contamination. Always dispose in the hazardous waste receptacle.
- In experiments that require the immersion of test tubes in a boiling water bath, be sure the tube opening points away from everyone's face as best as possible.
- Never use your bare hands when handling hot glassware. Test tube clamps will be provided.
- If a chemical reagent splashes into your eyes, rinse at the eyewash station for 10-15 minutes total.

Waste Disposal.

- Biohazard containers are lined with a clearly marked biohazard bag; plates, used gloves, and other contaminated materials should be placed in here for proper disposal. No sharps, glassware, or test tubes should be placed in here.
- Biohazard sharps containers are used for sharps, needles, glassware, etc.

- Sinks are for the disposal of selected liquid wastes only. Do not dispose of solid materials or animal remains in the sink.
- All disposable or broken glass material should be discarded in the “glass discard” container. NEVER pick up broken glass with your bare hands. Use a dustpan. No loose slides or coverslips should be left on trays or lab benches.
- All materials, slides, lancets, contaminated materials, etc. should be discarded in the “Sharps Hazardous Waste” container (RED)
- Gloves that have been in contact with chemicals (including preserved specimens) are to be disposed of in the trash. Gloves that have been in contact with microbes should be disposed of in the proper waste container (biohazard bag).

Pregnancy, Immunocompromised students and students with allergies.

- If you are pregnant or plan to become pregnant during the semester, please consult your lab instructor and physician with any concerns regarding the lab.
- Be sure to avoid organic solvents; these may include benzene, toluene, turpentine, methyl acetate, hexane, chloroform, xylene, perchloroethylene

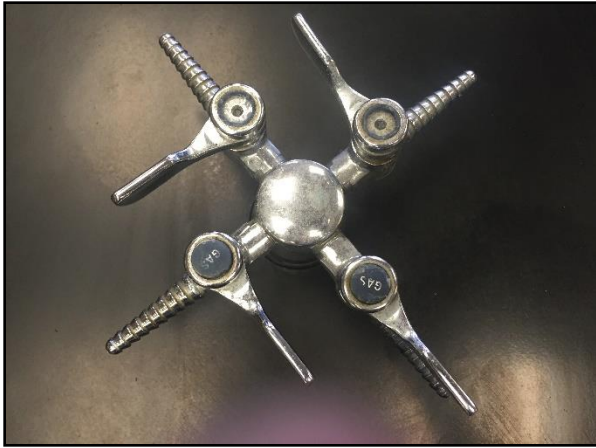
End of lab session.

- Disinfect lab benches at the end of each lab session.
- Return all equipment used to its designated location.
- Discard all waste materials as directed.
- Be sure electrical equipment is unplugged and returned to the proper areas (microscopes in the cabinets, etc.) as directed by the instructor.
- Secure gas jets in the off position
- Push in the lab stools as they can serve as a tripping hazard to others.
- Wash your hands after each lab.
- Throw away all trash and restore your lab bench area to the way it was upon arrival.

Microbiology specific laboratory safety guidelines:

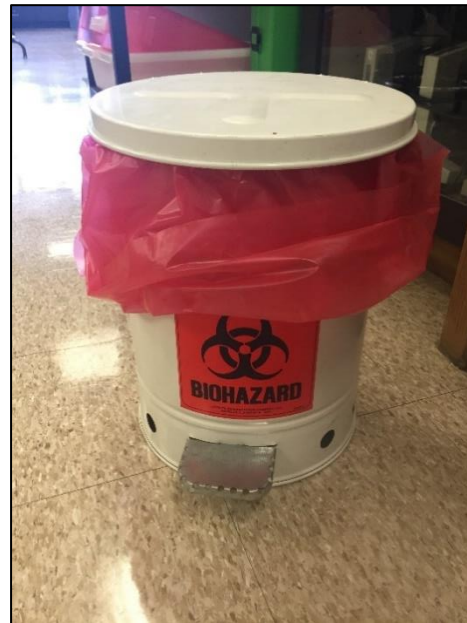
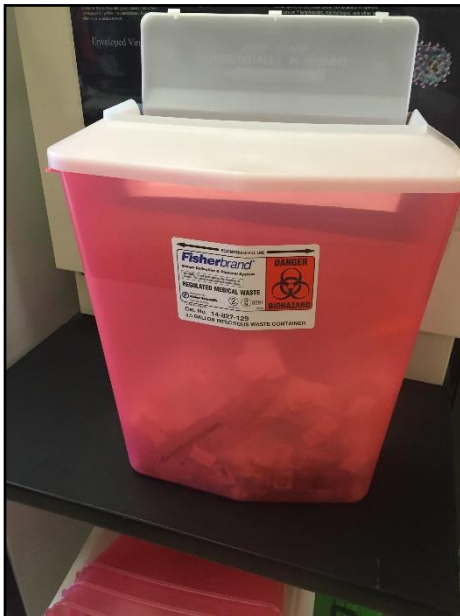
Gas jets.

- It is extremely important that when not in use the handles stay at a 90° angle; when on they will be parallel to the jets.
- When you are not actively using the Bunsen burner it must be turned off.



Waste disposal.

- There are two main receptacles that you will dispose of slides, agar plates, etc. The **red biohazard sharps disposal container** will be used for sharp disposal items and used slides; the **red biohazard bin** with inserted bag is specifically used for petri plates and any material that may contain bacteria (for example, paper towels that you use to clean up a spill). You will be directed weekly by your instructor where the proper disposal is for each item.



Incubators.

- When instructed by your instructor you will incubate plates and tubes until the following week. Room temperature incubation is the most common method for microbiology classes. We use a black cabinet that is clearly marked “Microbiology Class Cultures” and has the proper stickers to warn of biohazardous materials. Your section will have its own shelf for the duration of the semester. Do not put your tubes or plates on another shelf as they may be discarded. Please let your instructor know if there is no space left. Other times we may incubate in actual incubators set at various temperatures. Your instructor will place any samples into the proper incubator at the end of the class.



Fume hood.

- There may be times during the semester that you will have to prepare stains under the fume hood. Be sure to always use safety goggles and be very careful when carrying a stained slide back to your work bench. The door must remain closed when the hood is on.



Laboratory refrigerator.

- Sterile microbiological media is stored in the classroom Laboratory Refrigerator. Students are not permitted to use this refrigerator so please ask an instructor if there is no more media available for use on the lab benches.



Lab bench.

- Pens should be kept in the lab at all times. There will be a bin of supplied writing instruments that is cleaned each week.
- Store ALL bags, books, etc. to the sides of the laboratory. The only paper that should be on your desk is the laboratory exercise for that time. This laboratory book has been distributed in a loose-leaf fashion for a reason.

Cultures.

- Treat ALL microbes as potential pathogens. Immunocompromised students and students that are pregnant should consult their physician before taking this class.
- All bacteria maintained in the laboratory are under the American Society for Microbiology safety recommendations.
- Bacteria used in the laboratory are considered nonpathogenic; however it is important to follow the usage guidelines for each agent (for example, a diluted sample verse an undiluted sample)
- Place a paper towel over any spill containing microorganisms and pour disinfectant over the towel; let the disinfectant sit for 15 minutes then clean the spill with fresh paper towels. Properly dispose of the paper towels.
- Only walk out of the lab with the microbiome you walked in with!

Section II - Assessing Chemical Hazards in the Laboratory

Laboratory safety standards are determined by the **Occupational Safety and Health Administration** (OSHA), a federal agency. In compliance with the Laboratory Standard (29CRP 1910.1450), CCRI has its chemical hygiene plan published on the college webpage. At the college, we have an **Environmental Health and Safety Committee** that handles any potential problems that may arise.

OSHA went to a globally harmonized system that ensures any potential hazardous wastes are properly labeled with appropriate warnings. People working in any laboratory have the right to know of any chemical and biological hazard present. By law, each chemical used in a laboratory or workplace must be described and its safety and storage precautions given in a manufacturer's "**Safety Data Sheet**", or "**SDS**". A safety manual is usually in a yellow loose-leaf binder containing all the material safety data sheets for a given. Communication of hazard is accomplished by container labels and material safety data sheets.



The SDS sheets contain 16 sections:

Section 1 – Identification

Section 2 – Hazards(s) identification

Section 3 – Composition/information on ingredients

Section 4 – First-aid measures

Section 5 – Fire-fighting measures

Section 6 – Accidental release measures

Section 7 – Handling and storage

Section 8 – Exposure controls/personal protection

Section 9 – Physical and chemical properties

Section 10 – Stability and reactivity

Section 11 – Toxicology information

Section 12 – Ecological information*

Section 13 – Disposal considerations*

Section 14 – Transport information*

Section 15 – Regulatory information*

Section 16 – Other information

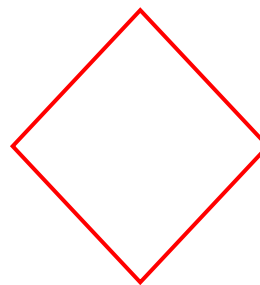
*enforced by other agencies

Please refer to the provided materials on your lab desk for a complete description of each.

In addition to the SDS information, OSHA and the **Hazard Communication Standard** (HCS) requires that pictograms are placed on labels to caution users of the potential hazards that they may be exposed to while using certain chemicals. Each pictogram has a red border with a white background.

There are **9 total pictograms** approved for use. These include:

- Health Hazard
- Flame
- Exclamation Mark
- Gas Cylinder
- Corrosion
- Exploding Bomb
- Flame Over Circle
- Environment
- Skull and Crossbones



Failure to comply with laboratory rules can result in personal injury or injury to another student and will result in expulsion from the laboratory and loss of credit for the session.

Section III - Classification of Biosafety Levels for Microorganisms

Biosafety levels (BSLs) provides a set of minimum laboratory standards that are required when handling microbes.

- **BSL-1 organisms** do not typically cause disease in healthy individuals. They present a minimal threat to the environment and only require standard laboratory safety guidelines to use and dispose of.
- **BSL-2 organisms** are encountered in the community and environment. These can pose a moderate health hazard and are sometimes associated with human diseases. When performing experiments with these microbes it is important to minimize contact, splash and aerosolization.
- **BSL-3 organisms** are considered to cause serious health conditions and disease. Special ventilation systems are required for their use and access to lab is prohibited and restricted unless properly trained.
- **BSL-4 organisms** have a great potential for lethal infection (in addition to the BSL-3 considerations).

Section IV – Universal Precautions

OSHA's **Bloodborne Pathogens** standard (29 CFR 1910.1030) sets forth to protect people in a laboratory that may come into contact with blood and blood products. We have developed a PowerPoint covering all of the important cautions and safety expectations concerning bloodborne pathogens.

Chemical Hazard training is additionally an important expectation. We have developed a PowerPoint covering all of the important cautions and safety expectations concerning bloodborne pathogens.