



Laboratory Safety Policy

Science laboratory experiences are critical to your undergraduate training and future career preparation. Embodying safe practices in the lab are a key part of this training. The activities and procedures experienced in lab at times involve working with potential hazards such as living animals, chemicals, specimens, microbes and equipment. Improper handling of any of these science materials can be dangerous and even life threatening to yourself and others. The following is a listing of safety practices you are to abide by and exhibit while working in the Medaille science labs. There may also be additional safety instructions given for unique situations within a lab.

No Medaille student will be allowed to participate in Medaille undergraduate labs until they read this Laboratory Safety Policy and then sign and submit the policy acknowledgement form. The signed policy will then be stored in each student's college record.

SAFETY RULES IN ALL SCIENCE LABS

The following apply to all laboratory activities.

- Food and Drinks are not to be brought into the laboratory.
- Nothing should be chewed/ingested while in the lab, including lab materials.
- Perform only laboratory work assigned by your teacher. Unauthorized laboratory experimenting is not allowed.
- Perform laboratory work only when your teacher is present. Unauthorized or unsupervised laboratory experimenting is not allowed.
- Your concern for safety should begin even before the first activity. Be on time, prepared, coherent and attentive. Always read and think about each laboratory procedure before starting.
- Clear your bench top of all unnecessary material such as books and clothing before starting your work.
- All coats, book bags and personal items should be kept off of the work bench and floor and be stored in the appropriate location during lab time per your lab instructor.
- Do not place potential trip hazards on the floor.
- Know the location and use of all safety equipment in your laboratory. These should include the first aid kit, safety shower, eye wash, fire blanket and fire extinguisher.
- Any laboratory accident or injury, however small, should be reported immediately to your instructor so proper response can be initiated and an incident report be generated.
- Turn off cellular phones/pagers before entering the lab. Notify the lab teacher if there is a specific need to have your cellphone turned on and then set it to vibrate. If you are observed using a cell phone, texting etc. during class without permission, you will receive an initial warning. If the behavior is repeated, you will be asked to leave class.

- Avoid unnecessary movement and talk in the laboratory. No inappropriate conversations or behavior.
- Wear proper protective equipment (PPE), including safety glasses, lab coats/scrubs, gloves and face shields as indicated by your lab instructor.
- Wear closed shoes (rather than sandals) without high heels. Keep a pair of sneakers in your dorm room, car or locker as backup.
- Tie back loose hair and clothing. Remove loose hanging jewelry/piercings.
- Do not wear unnecessary head coverings that may interfere with your experiment or impair your ability to hear teacher instructions.
- Wear heat mitts when handling hot items.
- To prevent cross-contamination, wear a lab coat/scrub when handling live animals that is different from the one used when working with chemicals, microbes or preserved specimens.
- Listen to your lab instructor for important directions and safety information.
- Read reagent labels carefully.
- Never use damaged or broken equipment. (Ex, damaged electrical cords, cracked or chipped glass)
- Notify instructor of any damaged or broken lab equipment.
- Never use electrical equipment while standing in or on wet surfaces or with wet skin.
- Never place electrical cords/equipment in puddles or on wet surfaces.
- Make sure hot plate cords are not in contact with the hot plate when in use.
- Under absolutely NO CIRCUMSTANCES are materials, including reagents, specimens or equipment, to be removed from the lab.
- At the end of each lab, return equipment, chemicals and specimens to their designated locations.
- Dispose of spent/waste materials per the instructor's directions.
- All spent glass is placed in the glass box.
- All other spent sharps (razor, scalpel blades, needles, pins, syringes) are placed in the red biohazard/sharps bin.
- Clean your workspace and wipe down the benches with cleaner/disinfectant. Push in chairs. Leave no trash, books or paperwork behind.
- Before leaving the laboratory, ensure that gas lines and water faucets are shut off. Also make sure equipment such as hot plates, water baths and fume hoods are shut off and unplugged.
- Wash your hands thoroughly every time before leaving lab.
- If in doubt, ask! Help your fellow students too!



CHEMICAL SAFETY RULES

- Read chemical labels twice to make sure you have the correct substance. Some chemical formulas and names may differ by only a letter or a number. Read labels for hazards too.
- Medaille College reagent/chemical label is given below.

		
		
		
H Health	F Flammability	R Reactivity
		Owner
		Exp.
		Prepared date:

Global Harmonized Standard for labeling of hazardous chemicals

<p>Health Hazard</p>  <ul style="list-style-type: none"> ■ Carcinogen ■ Mutagenicity ■ Reproductive Toxicity ■ Respiratory Sensitizer ■ Target Organ Toxicity ■ Aspiration Toxicity 	<p>Flame</p>  <ul style="list-style-type: none"> ■ Flammables ■ Pyrophorics ■ Self-Heating ■ Emits Flammable Gas ■ Self-Reactives ■ Organic Peroxides 	<p>Exclamation Mark</p>  <ul style="list-style-type: none"> ■ Irritant (skin and eye) ■ Skin Sensitizer ■ Acute Toxicity ■ Narcotic Effects ■ Respiratory Tract Irritant ■ Hazardous to Ozone Layer (Non-Mandatory)
<p>Gas Cylinder</p>  <ul style="list-style-type: none"> ■ Gases Under Pressure 	<p>Corrosion</p>  <ul style="list-style-type: none"> ■ Skin Corrosion/ Burns ■ Eye Damage ■ Corrosive to Metals 	<p>Exploding Bomb</p>  <ul style="list-style-type: none"> ■ Explosives ■ Self-Reactives ■ Organic Peroxides
<p>Flame Over Circle</p>  <ul style="list-style-type: none"> ■ Oxidizers 	<p>Environment (Non-Mandatory)</p>  <ul style="list-style-type: none"> ■ Aquatic Toxicity 	<p>Skull and Crossbones</p>  <ul style="list-style-type: none"> ■ Acute Toxicity (fatal or toxic)

RATING EXPLANATION GUIDE					
HEALTH		FLAMMABLE		INSTABILITY	
Recommended Protection		Susceptibility to Burning		Susceptibility to Energy Release	
4	Special full protective suit and breathing apparatus must be worn	4	Very flammable	4	May detonate under normal conditions
3	Full protective suit and breathing apparatus should be worn	3	Ignites under normal temperature conditions	3	May detonate with shock or heat
2	Breathing apparatus with full face mask should be worn	2	Ignites with moderate heating	2	Violent chemical change but does not detonate
1	Breathing apparatus may be worn	1	Ignites when preheated	1	Not stable if heated use precautions
0	No precautions necessary	0	Will not ignite	0	Normally stable

- Ask your instructor for the safety data sheet (SDS) for a chemical if you have specific concerns.
- You may be asked to transfer some laboratory chemicals from a common bottle or jar to your own test tube or beaker. Wear gloves and pour carefully.
- Avoid contaminating stock reagents and solutions. Do not return any excess material to its original container.
- Always pour acid into water.
- Work in the fume hood when using malodorous, corrosive, flammable, oxidizer, irritant or reactive chemicals.
- If you are instructed to smell something, do so by fanning some of the vapor toward your nose. Do not place your nose near the opening of the container. Your teacher will show you the correct technique.
- Never look directly down into a test tube; view the contents from the side. Never point the open end of a test tube toward yourself or your neighbor.
- Vent reactions vessels properly. Your teacher will show you the correct technique.
- Never leave open flames unattended.
- Do not use flammables near ignition sources.
- Use only a hot plate or heating mantle for heating flammables.
- Report any suspected gas leaks.
- In case of a chemical spill on your skin or clothing, immediately rinse the affected area with plenty of water. If the eyes are affected, water-washing must begin immediately and continue for 10 to 15 minutes or until professional assistance is obtained.
- When discarding used chemicals, carefully follow the instructions provided.

BIOHAZARD SAFETY RULES

- The type of organisms dealt with in the laboratory will dictate the safety precautions that are mandated. Working with pathogenic microbes requires a greater degree of vigilance than working with bacteria that are nonpathogenic. To clarify exactly what techniques and equipment should be used, microorganisms are classified into one of four biosafety levels (BSL-1 through BSL-4) based on their ease of transmission and pathogenicity. Each level has a set of minimum standards with regard to laboratory practices, equipment, and facilities. The table below summarizes the recommended biosafety levels for infectious agents. The vast majority of introductory microbiology laboratories are designed to handle BSL-1 and -2 rated organisms, and the rules that apply in these laboratories have a very common sense and feel about them. Adhering to these guidelines will help to ensure your safety in the microbiology lab.

Summary of biosafety levels for selected infectious agents					
BSL	Health risk	Practices	Primary barriers	Secondary barriers	Organisms (Selected examples)
1	Not known to cause disease in healthy individuals.	Open bench microbiology	None required	Open benchtops and sinks	<i>Micrococcus lutes</i> <i>Bacillus magisterium</i>
2	Can cause disease in healthy people, but organism are easily contained	Limited lab access and biohazard warning signs	Gloves, lab coat, eye protection, and/or face shield as needed	BSL-1 plus: Access to autoclave	<i>Escherichia coli</i> <i>Staphylococcus aureus</i> (most human pathogens)
3	Can cause severe disease, especially when inhaled	BSL-2 plus: <ul style="list-style-type: none"> Controlled access to lab No unsterilized material can leave the lab Decontamination of clothes prior to laundering. 	BSL-2 plus: Biosafety cabinets used for all manipulations	BSL-2 plus: <ul style="list-style-type: none"> Access to self-closing double doors. Negative pressure Exhausted air not recirculated 	<i>Mycobacterium tuberculosis</i> HIV <i>Yersinia pasties</i>
4	Highly virulent microbes	BSL-3 plus: <ul style="list-style-type: none"> Cloth must be 	BSL-3 plus: All procedures are conducted in	BSL-3 plus: Isolated building or	Lassa fever virus

posing extreme risk to humans especially when inhaled	changed before entering the lab, and personnel must shower upon exiting the lab. <ul style="list-style-type: none"> All material is decontaminated prior to leaving the facility. 	complete isolation BSCs or in class I or II BSCs along with full body, positive pressure suits with supplied air.	lab <ul style="list-style-type: none"> Isolated laboratory systems (air supply and exhaust, vacuum, and decontamination). 	Ebola virus Marburg virus
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- Follow proper aseptic techniques that your teacher will demonstrate to ensure safety to yourself and to others.
- To prevent contamination of your street clothes, always wear a lab coat. Do not wear the same lab coat to perform other duties outside the microbiology laboratory unless the coat has been washed.
- If a culture spills on your lab coat, use chlorine bleach when it is washed.
- Wear gloves when handling cultures and performing stains.
- Wash your hands thoroughly with detergent and water before leaving the laboratory, even if leaving for a drink of water or a “health break.”
- If you are immunocompromised, discuss the fact that you are taking a microbiology course with your physician.
- Before and after each class period, clean the laboratory table with the disinfectant provided for this purpose.
- Keep test tubes upright and in test tube racks at all times, unless they are being inoculated. The caps on most tubes used for microbiological procedures are not airtight; the tubes will spill if tilted, possibly resulting in contamination of the worker and the environment. Do not pick up or attempt to carry test tubes by their caps.
- In the event of a laboratory accident or injury, remain calm and notify the instructor. If the accident involves spilling or dropping a live culture, place paper towels over the spilled material and pour disinfectant generously over the towels. After 15 minutes, remove the towels and place them in the receptacle for contaminated materials. If the culture spills on your skin, wash the affected area thoroughly with the antiseptic provided.
- Always sterilize inoculating loops and needles before and after use by heating the entire length of the wire to redness. Do not blow on tools or slides to hasten cooling or drying.
- Never pipette by mouth. Never place contaminated pipettes on the laboratory table.
- Place contaminated materials, slides, and cultures in the areas designated. Do not pour any living culture material down the sink drain. Do not place gloves; contaminated materials, glassware, slides or cultures in the wastebasket.

Label your cultures with your name, the date, and the identity of the organism or specimen. Label petri plates on the bottom (agar side). Incubate petri plates in the inverted position (agar side up).

LIVE ANIMAL SAFETY RULES

- **Care of Animal-Inflicted Injuries**
 - Animal mouths and claws contain many bacteria. Infection of animal-inflicted injuries is common. Proper care, therefore, is imperative.
 - Report ALL injuries to your supervisor.
 - Scrub all scratches and bite wounds with antiseptic soap and rinse thoroughly under running water.
 - Encourage puncture wounds to bleed by compressing the sites of the wound. This will help remove deep bacteria.
 - Apply cold compresses to wounds. Puncture wounds should be kept open for at least the first 24 hours.
 - If bitten by a cat, contact your family doctor on the day that you are bitten in regard to possible antibiotic therapy.
 - If swelling, pain, limitation of use, or other signs of infection develop, report to your supervisor and obtain a medical evaluation by a physician.
 - To protect against tetanus, verify that your tetanus booster is up-to-date.

PREGNANCY

Medaille seeks to minimize the risks of working in its laboratories for all employees and students. Minimizing risks for pregnant women is especially important due to the sensitivity of the fetus to specific chemicals, biological agents and ionizing radiation. All lab workers should know the hazards of the materials with which they work and it is important to recognize that an individual's susceptibility to those hazards may change due to factors such as pregnancy.

Information about specific hazardous materials may be found in Safety Data Sheets (SDSs), labels, literature, from Risk Management and Safety or from the instructor for the class. All employees, including pregnant women, are encouraged to make use of the sources of information. Safe laboratory procedures minimize exposure for all laboratory employees and, if followed faithfully, they should also minimize risk to the developing fetus.

The federal Pregnancy Discrimination Act prevents Medaille from compelling a woman to disclose that she is pregnant, and it prevents her from being assigned to different tasks simply because she is pregnant. If a woman willingly informs Medaille that she is pregnant, then additional assessments, precautions or other accommodations can be implemented. Departments

and faculty will determine the extent to which a pregnant lab worker or lab student can be excused from lab requirements or what accommodations can be made.

In all cases, a pregnant woman should discuss her laboratory environment with her medical care professional and provide specific information about potential exposures.

Additionally pregnant lab workers can:

- Request a hazard assessment with Risk Management & Safety to understand those potential exposures and protective measures that should be utilized;
- Request from the Department, an altered assignment within the lab either through a change in lab duties, a reduced time-frame within the lab or a change in location*;
- Request a delay in entry into the academic program requiring the laboratory work*;
or
- Continue to work in a laboratory by utilizing the regular safety precautions that have been developed for the laboratory.

*Please note that requests for altered schedules might not be able to be honored.

Chemicals

Safety Data Sheets, container labels and literature provide information about the hazards of specific chemicals as well as allowable exposures to those chemicals. Be aware that most occupational safety and chemical hazard information considers allowable exposures to adults with healthy immune status. Teratogens and fetotoxic chemicals are of especial concern for pregnant workers, though all other hazards should still be considered. Hundreds of chemicals have been identified as having teratogenic effects; a few examples include, but are not limited to lead, ethanol, thalidomide, ethisterone, testosterone, retinoic acid, tetracycline, chemotherapeutic agents and certain ethylene glycol ethers.

Biological Agents

Some viruses and infectious agents have harmful reproductive effects in pregnant women. Examples include, but are not limited to Cytomegalovirus, Hepatitis B virus, Varicella-zoster virus, *Toxoplasma gondii*, and Rubella virus.

Ionizing Radiation

The first trimester is known to be the most radiosensitive time for a fetus, thus, it is beneficial, but not required, to meet with the RSO as soon as possible to review safety practices and monitoring options. If a pregnant radiation worker decides to declare her pregnancy, she will meet with the radiation safety officer to review radiation safety procedures, the risk to the fetus, and [NRC Regulatory Guide 8.13 \(pdf\)](#).

A pregnant woman who does not declare that she is pregnant is protected under the regulations for adult radiation workers.

All female radiation workers are given a copy of the NRC Regulatory Guide 8.134 (pdf) as part of the process of becoming a certified radiation handler.

SERVICE ANIMALS

All students who have a disability and require the assistance of a service animal should be aware that certain laboratories may present a hazard to the service animal's health. Although Medaille generally does not prohibit disabled students from being accompanied by a service animal, every such student is encouraged to consider his or her service animal's health in making the decision whether to expose the service animal to the laboratory. Medaille may prohibit the use of a service animal on its premises if the service animal is out of control and its handler fails to take action to control it, or if the service animal is not housebroken.

Service dogs in training will only be allowed in the laboratory with permission of the instructor.

OTHER MEDICAL CONDITIONS

Medical conditions (including allergies) can affect a student's ability to safely work in the laboratory. Students should inform their lab instructor of such medical conditions and discuss precautions that must be taken. Conversations regarding medical conditions will be kept confidential.

Medaille College Laboratory Safety Policy Acknowledgement Form

I am a Medaille College lab student and acknowledge that I have read and understand the Medaille College Laboratory Safety Policy.

Name (printed) _____ Signature _____

Date _____

References

1. *dwb4.unl.edu/chemistry/labs/labs00.html*
2. *Chemistry in the Community*, American Chemical Society, Kendall/Hunt Publishing Company, Dubuque, Iowa, 1988.
3. *Safety in the laboratory*. Dr. Ahsan, University at Buffalo
4. Medaille College Veterinary Technology Student Manual
5. Syllabi for Medaille College Science and Veterinary Technology lab courses.
6. Flinn Scientific Safety Contract,
http://www.flinnsci.com/Documents/miscPDFs/Safety_Contract.pdf
7. Medaille College Academic Classroom Conduct- Policy and Procedures for details.
http://www.medaille.edu/files/i/academics/academic_classroom_conduct_2014.pdf

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