

Safety Practices and Procedures

It is of the utmost importance that all individuals within a scientific laboratory practice safe operating procedures. One person's carelessness or ignorance of proper lab safety procedures can jeopardize the safety of all individuals in the laboratory. Adhering to the following laboratory safety principles will create a safe learning environment for students, faculty, and staff.

Remember that your actions or inactions could cause injury to a fellow student. Always use common sense and, when in doubt, ask faculty or staff for assistance.

I. Forms & Training to be Completed Prior to Start in Lab (Initial as each is completed)

1. Complete following CITI Training Modules (select NA if it is not applicable for your research):

- Responsible Conduct in Biomedical Research ____
- Working with IACUC ____
- Working with rats in research (if appropriate to protocol) ____
- Working with mice in research (if appropriate to protocol) ____
- Working with zebrafish in research (if appropriate to protocol) ____
- Reducing pain and distress in lab mice and rats (If appropriate to protocol) ____
- Aseptic surgery (if appropriate to protocol) ____

2. Before use of animals in research project:

1. Is listed on an approved IACUC protocol _____
2. Received training on ethical use of animals in research _____
3. Received Hands-on training on rodent handling and restraint _____
4. Received training on recognizing distress _____
5. Received training on planes of anesthesia _____
6. Submitted the request for facility access _____

III. Orientation

1. Submit Medical Clearance and Proof of Immunization Form _____
2. Complete and submit Risk-based occupational health surveillance enrollment _____
3. Read "Rodent Care Guide" document on Google Drive _____
4. Watch Jove videos on "Rodent Care Guide" document _____

5. Complete Lab Tour and Orientation _____
6. Review Biohazard Plan _____
7. Review Accident Guidelines:
 - a. location of eye wash _____
 - b. location of shower _____
 - c. emergency contact _____
 - d. Accident report form _____

IV. Generally, when you are in the lab:

1. Work methodically and at an even, reasonable pace. Follow directions and use common sense as you proceed.
2. Know how to get help if something goes wrong. Learn what safety resources are available, where they are located in the lab, and how to use them. Know where the emergency exits are located for the laboratories and the building.

V. Dress Code and Personal Protective Equipment

1. Students must adhere to the laboratory dress code requirements.
 - a. Wear closed-toe shoes that **cover the entire foot**. **No high heels, crocs, ballet flats, sandals, or flip flops.** Any shoe that does not cover the top of the foot is not acceptable in the laboratory. Socks are not an acceptable substitute for proper footwear.
 - b. Wear long pants that extend beyond the ankle and completely cover the legs. **Jeans with holes, leggings, spandex pants, tights, and yoga pants are not acceptable substitutes for long pants and are not permitted in labs.** Yoga pants are flexible, form-fitting pants, usually made of a spandex-like material that do not provide enough protection to be worn in the laboratory.
 - c. Tie back hair as it can be singed, catch fire, become contaminated with chemicals or biological material, or get caught in moving machine parts.
 - d. Exposed midriffs are not permitted in labs, as a spill on the lab counter can splash and potentially contact these areas causing injury.
 - e. Do not wear loose sleeves. The excess fabric may knock over items, catch fire, or drag through biologicals or chemicals.
2. Lab coats must be worn while working in the laboratory and must be buttoned at all times.

- a. Student names should be printed in marker on the back of the lab coat.
- b. Students must use care when working around open flames in Tyvek lab coats. Tyvek can melt when exposed to direct heat.
- c. Research lab coats are disposable coats made of a non-woven fabric and are blue. The blue lab coats cannot be used in chemistry courses because they do not offer protection from chemical splashes.
- d. All lab coats will be stored on designated coat hooks within the vestibule.

3. Lab safety glasses provide both splash and impact protection from liquid chemicals, acids or caustic liquids, chemical gases or vapors. Prescription glasses provide little protection to the eyes so safety glasses should be worn over them. Contact lenses are unacceptable as eye protection.

4. It is not recommended to wear contact lenses in the laboratory. If a splash to the eye were to occur, there is the potential for the chemical to seep under the lens. The contact lens will not only hold the chemical on the eye but will also hinder subsequent rinsing of the eye. Inform the lab safety manager if you wear contact lenses and ensure you wear safety glasses when conducting work in the lab.

5. Protection of the eyes is essential in any laboratory activity. Safety glasses must be worn anytime there is the possibility of a splash hazard to the eyes or face. Specifically, they must be used in the following scenarios:

- a. Handling chemicals hazardous to the eyes.
- b. Using chemicals with unknown hazards.
- c. Working with gases.
- d. Working with liquids which are hotter than 60°C or 140°F.
- e. Working with solid materials (i.e. glassware) or equipment under stress, pressure, or force that might cause fragmentation or flying particles.
- f. When dust or fumes are present.
- g. Working with preserved specimens during dissection activities.
- h. Working with any of the laboratory rodents at any time.

6. There is no one glove that is protective against every hazard in the laboratory. Make sure to use the correct gloves when working in the laboratory. **Rings should not be worn under gloves as they may cause punctures.**

7. Remove one glove and use the ungloved hand when touching any surface in common areas such as hallways, keyboards, door knobs, elevator buttons, etc. that other people, without protection, may also touch. The idea is to prevent cross contamination.

VI. Personal Safety

1. **Do not eat, drink, chew gum, apply any lip products and/or make-up, or put any pens, pencils, or gloves in your mouth during laboratory time.** Biological and chemical airborne toxins may contaminate any substance that may ultimately end up in or near your mouth. It is best to minimize the possibility of contact.
2. **Never taste biologicals or chemicals.**
3. Students may not remove any biologicals, chemicals, or reagents from the laboratory areas without the permission of the instructor.
4. Students must wash their hands with soap and water whenever reagents contact the skin. **Students must wash their hands before leaving the laboratory.**
5. Students should never use their mouth to pipette liquids. Use the provided pipetters.
6. **Students may not work alone in laboratories.** The PI or safety manager should always be present in the laboratory. If s/he is unavailable, two students or a student and a member of the laboratory staff must be present in the laboratory at all times while lab work is in progress.
7. All students must keep cell phones, extra books, clothing, and personal possessions away from the laboratory workbench as they can become contaminated. Only the items necessary for the lab are to be brought to the laboratory workbench. Store all possessions in the vestibule in the laboratories. Do not store them on the floor or in the hallways where someone may trip over them.
8. Do only the assigned laboratory experiments as described in the directions. Do not change the procedure unless the PI has approved it. **Do not perform more than one laboratory experiment at a time** as you may end up obtaining poor results from both. In addition, the accidental mixing of reagents from different experiments may be dangerous.
9. Check labels on bottles of biological and chemical reagents **twice** before removing any of the contents. Many chemical names sound similar. Do not take more chemicals than is needed by the laboratory exercise. The PI will tell you if any reagent is particularly hazardous. In general, **all chemicals and all biological specimens should be considered hazardous.**

10. To prevent contamination of chemical stocks, never return unused chemicals to the original containers.
11. Always hold containers away from your body when transferring reagents from one container to another or heating a reaction.
12. **All acids should be handled with extreme care.** The proper dilution of an acid is to add the acid to water with a swirl or stir. Never add water to an acid. Be advised that heat may be produced. **Helpful Hint: Remember A to W – Acid to Water – Alphabetical Order!**
13. To determine the odor of a chemical, waft the vapors toward your nose with your hand. Never place your nose directly over a bottle or test tube and sniff.
14. Do not use broken or cracked glassware and only use fire polished glass tubing.

VII. Housekeeping

1. Keep the area as clean as the work allows. Work surfaces should be kept as clean as possible, with only those items needed for the immediate project on that surface.
2. The laboratory should be kept clean by wiping down all counters with PREempt Disinfectant after each laboratory experiment or use of the counter.
3. Return chemicals and equipment to their proper places, dispose of trash, and make sure the drains are uncluttered.
4. When using gas or vacuum outlets, make sure they are turned off before leaving the laboratory.
5. Ensure that all equipment that was used when working in the laboratory for the day is properly turned off and/or returned to its original operating state.
6. Check the restock list for each room that you were using and restock items as necessary.
7. Put away papers, notebooks, pens etc. when you are done using them. **RETURN ITEMS TO THEIR PROPER PLACE**

8. If you see paper or trash on the floor, please pick it up.

VIII. Fume Hoods and Biosafety Cabinets

1. Fume hoods may be required for all or part of the laboratory experiment. Students must use fume hoods when instructed to do so and should understand the importance of their use for the assigned laboratory experiment. The following procedures should be followed when using a fume hood:

- a. Fume hoods should be monitored to ensure proper face velocity of around 100 fpm. If you believe the fume hood is not working properly (the piece of yellow tape is not moving), immediately stop working within the fume hood and inform faculty or staff.
- b. Working fume hood sash height should be no higher than 18 inches and generally no lower than 12 inches. Use the sash stop of the fume hood as a guide to the proper sash height. To reduce energy costs, the fume hood sash should be pulled all the way down when the hood is not in use.
- c. Experiments should be performed 6 inches within the fume hood to prevent fumes from escaping into the laboratory.
- d. Keep the amount of equipment in the fume hood to a minimum to prevent turbulence.
- e. Do not allow Kim Wipes or paper towels to be sucked into the back of the fume hood. They may lodge into ducts and fans and can affect the operation of the hood.
- f. Be aware that walking in front of an operating fume hood, as well as working within the fume hood will alter the velocity and affect flow.
- g. Small beaker fires can be extinguished within the fume hood by suffocation using a watch glass or another piece of glassware. Anything larger than a small beaker fire should never be extinguished by students. The fume hood sash should be closed and the laboratory evacuated. The fire alarm should be pulled while exiting the building to alert the fire department and others within the building.

IX. Waste Disposal

1. Pipette tips, slides, and other contaminated items that can puncture or pierce a bag should be placed in a “Sharps” container. These are labeled receptacles found throughout the laboratories, a small labeled biohazard cardboard sleeve (Bio-bin). Needles, syringes, scalpel blades, razor blades, or blood tubes must be disposed of in puncture resistant and leak proof red containers for biohazard contaminated sharps.

X. Chemical Labeling

National Fire Protection Association (NFPA 704 Diamond) labeling

or

B.



a. This system uses a diamond shape symbol with color coded categories of hazard. The diamonds will contain a hazard rating range of 0-4 indicating the degree of hazard associated with that chemical. Helpful Hint: The higher the number, the more hazardous the chemical is for that category.

1. Red indicates flammability
2. Blue indicates health
3. Yellow indicates reactivity
4. White indicates a specific or special hazard such as water reactive, acids, bases, oxidizers, or corrosives.

b. For every container where there is a chemical inside (including water), a NFPA label needs to be filled out **completely**, including the date that the chemical was put into the container, the chemical's name, and the diamond symbol with the degrees of the hazard of that chemical.

XI. Reporting safety and human animal use violations:

1. Spills, Accidents, and Other Hazardous Incidents.

All spills, accidents, and other hazardous incidents **MUST** be reported to the PI (Dr. Ingrid Tulloch) via email (ingrid.tulloch@morgan.edu) or phone (917)-622-5170.

For:

- Chemical Spills
- Animal Bites
- Contact with Hazardous Chemicals (inhalation of gases, skin contact, eye contact)
- Needle Sticks

2. Anonymous Reporting

If you observe animal cruelty or any suspicious activity in the BSSC Vivarium, you may report them anonymously to the reporting box in 116Q, or contact Dr. Ingrid Tulloch (Principal Investigator and Vivarium supervisor) at ingrid.tulloch@morgan.edu and (917)-622-5170, Dr. Edet Isuk (Reporting Safety Chair) at edet.isuk@morgan.edu and 443-885-3447, or Dr. Hongtao Yu (Chair of IACUC) Hongtao.Yu@morgan.edu and (443) 885-4515.

Name _____

Sign to indicate this document was read and understood

Date _____