

Division of Teaching Labs Policies and Procedures

When participating in laboratory sessions in the Division of Teaching Labs (DTL) at the University of Toronto (UofT), Faculty of Medicine, there are several policies and best practices that must be followed. Here at DTL we constantly strive to provide the safest environment possible. To this end we ask that each student read the following policies and procedures. Keep in mind that as a UofT student, under the Code of Student Conduct, you are expected to abide by these policies and procedures.

PART ONE: GENERAL LAB POLICIES AND PROCEDURES

GENERAL RULES

1. Always act in a responsible manner in the lab.
2. Always be prepared by reading through the lab instructions prior to coming to class. Always check-in with your instructor before proceeding with an experiment and if you are unsure of any of the directions or how to operate particular equipment.
3. Keep work areas clean and tidy at all times. Likewise keep the floor and aisles clear. Bring only the necessary laboratory materials (e.g. lab manual and notebook) to your bench. Other items (coats, backpacks, etc.) should be stored in the designated areas in the lab room.
4. Always respect your fellow students and other personnel in the lab. To help reduce the possibility of accidents you should at all times be concentrating on what you are doing, and at no time should you engage in any form of horseplay.
5. **Never consume food or beverages or place any food/beverage items on any lab surfaces including the Interlabs. Never dispose of food or beverage waste in lab garbage bins.** If you wish to consume food or beverages you may do so out in the hallways and dispose of the food/beverage waste in the hallway garbage bins.
6. Dress appropriately for all lab activities by wearing closed-toe shoes and long pants. Always tie back long/loose hair and secure any dangling jewellery.
7. Wear the appropriate personal protective equipment, PPE, (e.g. gloves, goggles, lab coat) as directed by your instructor. **A fully buttoned up lab coat is required to participate in all wet lab sessions.** Each student must bring their own lab coat to the lab, which can be purchased from the Bookstore or MedStores on campus. Store your lab coat in a plastic bag separate from your other belongings.
8. Keep your hands away from your face, eyes, mouth and body. Do not handle any portable devices, such as cellphones, laptops, or other devices with gloved or unwashed hands.
9. Remove all PPE and wash your hands with soap and water after performing experiments and before exiting the lab room. Use designated handwashing sinks ONLY for washing hands, not for disposing of reagents, rinsing glassware or conducting experiments.
10. Clean up after the lab by: (a) disposing of waste in designated containers; (b) removing all labels from reusable glassware, then rinsing the glassware and placing it in the designated containers; (c) clearing your lab bench and any Interlab space that you've used; and (d) rinsing and returning all equipment clean and in working order to their original place.
11. If any equipment is broken or malfunctioning, inform your instructor or the Interlab technician so that it can be repaired.
12. Never pipette by mouth; only use the rubber bulbs or pipette aids provided. When using a pipette aid, you must be *extremely careful* to not draw any liquid into the pipette aid.
13. Never bring chemicals, biological organisms, glassware or equipment into the Interlab except when necessary to use a piece of equipment located there (e.g. balance, spectrophotometer, centrifuge, etc.) or to use the fumehood in the Interlab. If it is necessary to bring such items into the Interlab then the student must also bring it back to his/her lab bench after use.
14. Never transfer equipment, glassware, biological organisms or chemicals from one lab to another unless specified and supervised by the instructor. The instructor should inform the Interlab technician of any equipment transfers.
15. When using equipment taken off shelves or wagons return them to their original location at the end of the lab session.
16. To reduce the possibility of accidents, keep Interlab traffic to a minimum so that it does not become overcrowded.
17. Handle all glassware, sharps, organisms and chemicals in a respectful manner and dispose of them properly. Specific guidelines on how to dispose of various types of waste are described in Part Two.
18. Let your instructor know if you have **any allergies or medical conditions** which may affect your ability to conduct an experiment or to receive treatment in the event of an accident or health incident.

EMERGENCIES, ACCIDENTS & INJURIES

19. Know the location and operating procedure of the eye wash station within your lab and emergency shower in the Interlab. Your instructor will show you how to use an eye wash station.
20. Know the location of the dust pan and broom, spill kit, and first aid kit. Your TA/instructor will attend to spills, broken glassware and first aid; students are not to clean up spills or attend to injuries.
21. Report any accident (spill, breakage, etc.), injury (cut, burn, etc.), or health incident (e.g. dizziness, fainting), to the instructor immediately, no matter how trivial it may appear.
22. If a chemical splashes in your eye(s), immediately flush with running water from the eye wash station for at least 20 minutes. Notify your instructor immediately.
23. If a chemical splashes on your skin, immediately flush with running water for at least 20 minutes. For small spills (e.g. on your hand) it would be appropriate to use a sink. Use of the emergency shower is usually only necessary if a large amount of a hazardous substance has splashed on your body. If clothing is contaminated it should be removed. Notify your instructor of the incident immediately.
24. Know the location of the fire alarm and emergency exits.
25. In case of emergency or fire drill, stay calm and follow your instructor's directions. You may be required to shut down certain equipment (e.g. Bunsen burners) before exiting the lab room. Leave all bags, coats, etc. in the lab rooms and proceed in an orderly fashion along with your instructor to the nearest exit. Your instructor will ensure that the lab room is locked.

WORKING WITH OPEN FLAMES & HEATING SUBSTANCES

26. Always follow your instructor's directions on the proper use of Bunsen burners and other heating devices (e.g. hot plates, high temperature water baths).
27. Exercise extreme caution when using a Bunsen burner. Tie back long/loose hair, loose jewellery, and ensure you are a safe distance from the flame at all times. Do not put any substance into the flame unless specifically instructed to do so. **NEVER** reach over an exposed flame. **NEVER** leave a lit Bunsen burner unattended.
28. **NEVER** leave anything that is being heated at high temperature or is visibly reacting unattended.
29. Always turn the burner or hot plate off when not in use.
30. Exercise extreme caution when transferring substances into and out of boiling water baths, heating blocks or microwaves.
31. Protect your hands (e.g. use tongs, wear protective gloves) when handling glassware or metal objects that have been heated.

HANDLING REUSABLE GLASSWARE

32. Students must respect glassware as potentially hazardous and dangerous items. Glassware must only be handled for its intended purpose.
33. Dirty reusable glassware **MUST** be placed in the appropriately marked DIRTY glassware containers. **DO NOT PUT DIRTY GLASSWARE BACK IN WITH CLEAN GLASSWARE.**
34. Thoroughly rinse glassware (if non-hazardous) and remove all labels before placing them in the dirty glassware bins.
35. Broken and disposable glassware (including Pasteur pipettes), plastic consumables (e.g. tips), and items designated as sharps are to be disposed of in the appropriate containers as described in Part Two.

RECYCLING

36. In many instances waste generated within a laboratory setting can be safely recycled thereby minimizing the environmental impact of your work. Items that may be recycled include: glassware, plasticware, paper products, electronics (toner, computer equipment, lab equipment), and batteries
37. Before you consider recycling any solid waste you must ensure that it is **NOT CONTAMINATED** with any hazardous material; it has to be free of any biological, chemical, or radioactive contamination.
38. All products must be triple rinsed before they are placed into the designated recycling container/bin.
39. Please check with your instructor as to whether you may recycle a particular item.

PART TWO: PROPER HANDLING & WASTE DISPOSAL IN THE LAB

CHEMICAL HANDLING AND DISPOSAL

During the course of a lab session you may be required to dispense or handle hazardous reagents that may be reactive, poisonous, and/or corrosive. Please make sure that you use appropriate PPE and exercise precautions when handling such chemicals and dispose of them into the appropriate container as outlined below.

Note that glassware and consumables that have biological or radioactive contamination are treated differently (see sections on Working with Organisms and Working with Radioisotopes below).

When working with chemicals:

- Pay attention to warning labels provided on chemical bottles.
- Take only as much chemical as you need.
- Never return unused chemicals to their original containers.
- **Never** touch or taste any chemicals. When smelling a chemical use the wafting technique.

When disposing of chemical waste:

- **LIQUID CHEMICALS:**
 - Use designated bottles or beakers that will be setup and labelled in the lab. **DO NOT fill** containers past 75% of the total volume.
 - Some chemicals can be disposed of down the drain; before doing so, verify with your instructor that this is permitted.
- **SOLID CHEMICALS:**
 - Use designated beakers that will be setup and labelled in the lab.
- **LAB CONSUMABLES USED WITH CHEMICALS (EXCEPT MEDICAL SHARPS):**
 - Lab Consumables (LCs) such as tips, microtubes, Pasteur pipettes, that have come into contact with **non-hazardous** chemicals are collected in a Milkshake Cup at your workbench and disposed at the end of your class in a designated container.
 - LCs such as plastic tubes, plastic 96-well plates, plastic syringes (**not needles**) that have come into contact with **non-hazardous** chemicals should be rinsed and collected in a designated container on the centre bench. These plastics will be recycled with the municipal waste.
 - LCs used with **hazardous material** must be disposed of in a **GREEN PAIL**, unless designated otherwise by your instructor.
 - Note that Pasteur pipettes are not reused, therefore they must **always** be disposed of in the **GREEN PAIL**. Do not place Pasteur pipettes into basins marked for dirty pipettes (this refers to reusable glass pipettes only). Remember to return the rubber bulb to the general laboratory supplies tray.
- **MEDICAL SHARPS USED WITH CHEMICALS:**
 - Razor blades, scalpels, needles, lancets and other medical sharps are disposed of in a **YELLOW BIOHAZARD SHARPS CONTAINER** ONLY!

If you are unsure or confused as to where something should be disposed of always ask your instructor! Images of the various disposal containers can be found at this website:

http://teachinglabs.med.utoronto.ca/StudentArea/Pages/DTL_LabPolicy.html

WORKING WITH ANIMAL SAMPLES

Overview:

Animal work is typically conducted in the Department of Comparative Medicine's (DCM) facilities. Students will receive training from DCM and must comply with their rules and regulations for proper animal care.

For animal experiments conducted in DTL, students will receive hands-on training from the Course Coordinator, teaching assistant, or a DCM staff member.

Procedures at DTL:

Animal products are collected in biodegradable **GREEN BAGS**. **DO NOT** place any other materials such as gloves, paper towels, tips, needles, etc., in these bags.

Students are responsible for the surgical instruments that they use. All surgical instruments must be soaked and washed after each use to prevent damage. Instructions will be provided in the lab.

Photographing any animal work is not permissible given the sensitive nature surrounding the use of animals in experiments.

WORKING WITH HUMAN SAMPLES

Working with and disposing of human samples:

Universal Precautions must be taken whenever conducting experiments involving human blood and any other potentially infectious material (e.g. saliva, urine, etc.). Since we cannot determine by eye whether such materials may be infectious, we must treat them as if they are infected and handle and dispose of them as potentially infectious materials. These materials and all contaminated waste generated during these experiments are disposed of in **YELLOW BIOHAZARD PAILS**.

In the case of an accident involving human blood or other potentially infectious material:

- If you are bleeding, notify your instructor immediately. Do not ask fellow classmates for assistance so that we minimize the risk of exposure to others.
- If your injury allows, you may be asked to help clean up any contaminated areas.
- Anyone who assists an injured party should wear gloves to protect themselves.
- All contaminated areas must be properly disinfected and infectious waste disposed of in the **YELLOW BIOHAZARD PAILS**.

WORKING IN A CONTAINMENT LEVEL 2 ROOM

Rooms that are zoned as Containment Level 2 (CL2) have special rules:

- ❖ Users of these rooms may not bring personal items (e.g. backpacks, coats, etc.) into these rooms. Designated storage rooms will be provided for you to store your personal belongings.
- ❖ Lab coats used in these rooms must stay in these rooms. At the end of the course, your lab coat will be disinfected and washed, and returned to you.

Currently, DTL rooms 3282, 3284, 3379, 3381, 3383 and 3397 are designated as CL2 (indicated by signs on the doors).

WORKING WITH MICROORGANISMS: RISK GROUP 1

When working with microorganisms designated as Risk Group 1 (RG1), special precautions must be taken to ensure the workspace is used and cleaned properly and that all biologically contaminated waste is properly disposed of in the appropriate containers. Please verify with your instructor whether the biologicals you will be using are designated as RG1 or RG2.

When working with RG1 organisms:

- Wear the appropriate PPE as directed by your instructor
- Disinfect your workbench BEFORE and AFTER use with either Dettol or 70% alcohol

When disposing of RG1 waste:

- Dispose of RG1 biologically contaminated waste into appropriate containers, using the following rules:
 - **GLASSWARE**
 - **REUSABLE GLASS PIPETTES:** Biologically contaminated reusable glass pipettes (not Pasteur pipettes) should be placed in **METAL PANS OR BLEACH-FILLED JARS** as instructed by your instructor
 - **OTHER REUSABLE GLASSWARE:** Other biologically contaminated reusable glassware (e.g. beakers, flasks, etc.) should be placed in the designated **METAL BUCKETS**.
 - **MEDIA PLATES:** Place solid media plates in the designated **METAL BUCKETS**.
 - **LAB CONSUMABLES**
 - **LAB CONSUMABLES:** Biologically contaminated consumables (e.g. tips, Pasteur pipettes, but NOT medical sharps such as needles and razors) are disposed of in a receptacle lined with a **RED BIOHAZARD BAG OR METAL CONTAINER**
 - **MEDICAL SHARPS:** Razor blades, scalpels, needles, lancets and other sharps are disposed of in a **YELLOW BIOHAZARD SHARPS CONTAINER** ONLY! **Do NOT attempt to remove a needle from a syringe or recap the needle;** place the entire assembly in the sharps container.
 - **LIQUID WASTE:** Use designated bottles or beakers that will be setup and labelled in the lab. **DO NOT fill** containers past 75% of the total volume.

When using biosafety cabinets (BSCs) with RG1 organisms:

- Disinfect the workspace before and after use
- Tidy up
- Dispose of any materials (tips, pipettes, etc.) as directed by your instructor

Note that standard BSC procedure is for only one user to work at a BSC at a time. For teaching purposes, we may allow two students to work simultaneously at a larger BSC for RISK GROUP 1 WORK ONLY.

WORKING WITH MICROORGANISMS: RISK GROUP 2

When working with microorganisms designated as Risk Group 2 (RG2) special precautions must be taken to ensure the workspace is used and cleaned properly and that all RG2 waste is properly disposed of in the appropriate containers. Please verify with your instructor whether the biologicals you will be using are designated as RG1 or RG2.

When working with RG2 organisms:

- Wear the appropriate PPE as directed by your instructor
- Disinfect your workbench BEFORE and AFTER use with either Dettol or 70% alcohol

When disposing of RG2 waste:

- **ALL RG2 WASTE:** All waste from RG2 organisms (plates, tips, lab consumables, etc.) **MUST BE** disposed of in **YELLOW BIOHAZARD PAILS**
- **MEDICAL SHARPS:** Razor blades, scalpels, needles, lancets and other sharps are disposed of in a **YELLOW BIOHAZARD SHARPS CONTAINER** ONLY! **Do NOT attempt to remove a needle from a syringe or recap the needle;** place the entire assembly in the sharps container.

When using biosafety cabinets (BSCs) with RG2 organisms:

- Disinfect the workspace before and after use using the 70% alcohol provided in spray bottles
- Tidy up
- Dispose of any materials (tips, pipettes, etc.) as directed by your instructor

Note that biosafety regulations stipulate that ONLY ONE USER SHOULD WORK AT A BSC AT A TIME WHEN CONDUCTING WORK WITH RISK GROUP 2 ORGANISMS. Students must comply with this regulation when working with Risk Group 2 organisms in our BSCs.

WORKING WITH RADIOISOTOPES

Note: For 2018-19, no courses run in DTL will be using radioisotopes.

When working with radioactive substances:

- Wear gloves and a lab coat at ALL TIMES
- ONLY work over benches that have been covered with white absorbent paper
- ONLY use equipment/tools that have been specifically designated for radioactive work, such as MARKED centrifuges, MARKED shakers, MARKED pipettors, etc.
- Understand the properties, risks and proper handling procedures associated with the particular radioisotopes you are using; ask your instructor if you are at any time unsure about the proper procedures.
- If any equipment or workspace becomes contaminated with a radioactive substance inform your instructor immediately so that it can be removed from use and decontaminated.
- If an accident or injury occurs while working with a radioactive substance inform your instructor immediately so that the appropriate assessment and treatment can be performed.

When disposing of radioactive substances:

- Dispose of radioactive waste into the appropriately MARKED containers:
 - **LIQUIDS:** Carefully pour or pipette radioactive liquids into the appropriate **CELITE CONTAINER** – note that specific containers are used depending on the half-life of the radioisotope. Be sure not to overfill these containers. Do not put any solid waste in these containers.
 - **SMALL LAB CONSUMABLES (E.G. TIPS, TUBES):** Place in the provided empty glove boxes on the bench as you are working. When you have completed your work (or when the box is full), seal the glove box with tape and dispose of it in the **YELLOW RADIOACTIVE WASTE BIN**.
 - **OTHER DISPOSABLE SOLIDS:** Dispose of solids (e.g. gloves, paper towels, etc.) in the **YELLOW RADIOACTIVE WASTE BIN**.
 - **GLASSWARE:** Before they can be placed in the dirty glassware bins, radioactively-contaminated glassware must be thoroughly rinsed using Dettol solution and all rinse solutions disposed of as radioactive liquid waste in the appropriate celite container. Do NOT dispose of the rinse solutions down the drain!
- See pictures of containers at: http://teachinglabs.med.utoronto.ca/StudentArea/Pages/DTL_LabPolicy.html