Institute of Biomaterials and Biomedical Engineering

Safety Policy Manual

May 2015

Institute of Biomaterials
& Biomedical Engineering
UNIVERSITY OF TORONTO

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1. Introduction

The Institute of Biomaterials and Biomedical Engineering (IBBME) hosts a diverse array of research and teaching activities as a consequence of a unique association with the Faculty of Engineering as well as the Departments of Medicine and Dentistry. Promoting a healthy and safe environment in the various workspaces across the Institute is a **SHARED RESPONSIBILITY** of all individuals affiliated with the IBBME, including the University of Toronto Environmental Health & Safety (U of T EH&S), the director of the Institute, all supervisors, faculty, staff and students. The IBBME Safety Committee has created this Manual as a quick resource for the IBBME community, to assist each individual in understanding their rights and responsibilities in relation to a safe work environment.

2. Manual Overview and Definitions

The purpose of the IBBME Safety Manual is to provide any individual working within the Institute a single source of Institute and University Policies clearly outlining workplace responsibility and duties. The IBBME Safety Manual is intended as a supplement to the University document (http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/biomanual/bm.pdf), and contains policies and procedures relevant for all workers at the IBBME.

The Ontario Occupational Health and Safety Act (the "Act") specifies that all University employees (including faculty members, researchers, administrative and other support staff, as well as students) are considered "**workers**" if they have been paid to perform work or supply services. The Act further defines a "**supervisor**" as any individual in charge of a workplace or with authority over a worker. Faculty members or principal investigators who oversee a research project(s) are considered to be supervisors. Please refer to the Act for specific definitions (http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm#BK44) as well as the U of T EH&S website for supervisory responsibilities (http://www.ehs.utoronto.ca/resources/FAQ.htm#Question_GS_4).

Every worker has legal obligations under the Occupational Health and Safety Act to ensure that all work, whether at the Institute or in direct relation to the Institute, is conducted in a safe manner. The purpose of the Act is to protect workers from health and safety hazards in the workplace and to establish procedures for dealing with hazards in the workplace. This manual lists the Institute and University policies developed in response to the Act. The Act defines that the employer must take every reasonable precaution to protect workers, and workers (Institute employees, all students paid by the Institute, visiting researchers, or any other individual performing work in the Institute) are forbidden from disobeying safety regulations and knowingly working in an unsafe manner. Fines and/or jail sentences may be (and have been) issued for violations of the Act.

The University and its employees must also abide by a number of other federal, provincial, and municipal regulations related to the Occupational Health and Safety Act. These include, but are

not limited to, regulations governing the disposal of wastes, the handling of designated substances, the handling and disposal of radioactive and/or biohazardous materials, and the transport and handling of dangerous goods.

For more detailed information related to Health & Safety concerns, please visit the U of T Environmental Health and Safety website at http://www.ehs.utoronto.ca/Home.htm.

Questions regarding the Occupational Health and Safety Act and related regulations should be directed to:

Office of Environmental Health and Safety
215 Huron Street, 7th Floor
University of Toronto
Tel: (416) 978-4467; Fax: (416) 971-1361

3. IBBME Health and Safety Policies

Recognizing its unique position within the Faculty of Engineering and University of Toronto, the IBBME executes the following IBBME Health and Safety Policies [Occupational Health and Safety Act, 25 (2) (j)]:

Policy #1: Every individual (student, faculty member, researcher, administrative or other support staff, volunteer, etc) shall participate in required safety training at the onset of their tenure with the IBBME (learning period as determined by the contract or direct supervisor), and will **proactively maintain up-to-date training as required**. Required safety training for work at satellite locations (i.e., UHN; affiliated hospitals) **does not** substitute for IBBME-specific training.

Consequence: *Authorization to enter specific IBBME workspaces (i.e., issuance of key cards or door keys) shall not be permitted until required training has been successfully completed. Repeated negligence with regard to training requirements may result in payroll suspension.*

Policy #2: Every individual shall be aware of work-related safety hazards (ergonomic, biological, chemical, electrical, physical, psychosocial, etc) and their individual responsibilities, including documenting and reporting incidents.

Policy #3: Access to Health & Safety-related information shall not be denied unless an individual's privacy is of concern and must be protected (e.g., mental issues, treatment history, recovery process, etc.), particularly when this information is related to the person and not to the workplace.

Policy #4: Implementation and enforcement of the IBBME Health & Safety Policies is the direct responsibility of the IBBME management and supervisors of individual IBBME workspaces. While it is the responsibility of each supervisor to ensure a safe work environment as well as individual compliance with safety requirements (i.e., training),

each individual also assumes responsibility for maintaining a safe workspace and up-to-date training.

Policy #5: The Health & Safety Policies shall be reviewed annually by the Health & Safety Committee. The recommendations resulting from the annual review shall be submitted to the IBBME administration for consideration and implementation.

4. Individual Responsibilities

Worker Responsibilities

Workers (defined as Institute employees, all students employed within/by the Institute, any other individual being paid to do work or volunteering at the Institute) must comply with the Occupational Health and Safety Act and related regulations and policies. Workers **MUST**:

- attend the appropriate/required safety training sessions as determined by the Institute, and maintain up-to-date training requirements;
- immediately report unsafe working conditions and violations of safety regulations to their supervisor, the Director of the Institute, or the Co-Chairs of the IBBME Safety Committee;
- never remove or tamper with protective devices required by the Act or by the employer;
- not work in a manner that may endanger themselves or any other worker;
- not engage in horseplay, pranks, or other potentially dangerous conduct;
- report all accidents/incidents to the Health and Well-being Programs and Services within 24 hrs of occurrence (please refer to the following website for incident reporting: http://www.ehs.utoronto.ca/resources/wcbproc.htm);
- be familiar with the hazards and safety procedures for activities involving hazardous work in the laboratory, as well as, information systems such as Material Safety Data Sheets for hazardous chemicals used in the laboratory;
- know the labelling requirements of the WHMIS regulation;
- use the appropriate laboratory safety equipment and personal protective equipment as provided and directed by the employer;
- do their work in accordance with written safety procedures for activities involving hazardous work in the laboratory;
- adhere to proper hazardous waste disposal guidelines.

Supervisor Responsibilities

Under the Occupational Health and Safety Act, supervisors have a legal duty to take every reasonable precaution to ensure that their workplace is safe. The IBBME has further determined that all supervisors **MUST**:

- attend the appropriate/required safety training sessions as determined by the Institute, and maintain up-to-date training requirements;
- implement the specifications within this document in their workplace;

- ensure that all laboratory workers clearly understand their responsibilities as defined in this document and provide a copy of this document to their employees;
- be familiar with the provisions of the Occupational Health and Safety Act, and with the University and Institute policies as they apply to the workplace under their supervision;
- ensure that their laboratories are in compliance with all Biosafety and Radiation requirements appropriate to the level of research being conducted within the laboratory;
- ensure that workers under their supervision enrol and successfully participate in required safety training sessions;
- be knowledgeable about health and safety hazards (actual or potential) in their workplace, and must advise workers about these hazards;
- provide appropriate safety and protective equipment to workers, and ensure that this equipment is properly maintained. Safety procedures for activities involving hazardous work must be available within the laboratory;
- ensure that workers under their supervision properly use safety equipment, and that workers follow safe working procedures, as governed by the Act or by University or Departmental policies;
- maintain an up-to-date inventory of all hazardous materials in their workplace;
- ensure that all hazardous materials are properly identified and labelled, and that material safety data sheets are readily available for all hazardous materials;
- ensure that all hazardous materials are disposed of in accordance with federal, provincial, municipal, University of Toronto, and Institute regulations. Please see (http://www.ehs.utoronto.ca/resources/wmindex.htm) for complete details;
- ensure that all accidents/incidents involving unpaid students or visitors have been reported to the Insurance and Risk Management office by completing the following online form: http://www.ehs.utoronto.ca/resources/wcbproc/Non_U_of_T.htm within 24 hrs of occurrence.

Specific University of Toronto Supervisory responsibilities can be found at:
http://www.ehs.utoronto.ca/resources/FAQ.htm#Question_GS_4.

IBBME Safety Committee Responsibilities

The IBBME Safety Committee is an internal resource that addresses safety policies and issues *specific to the varied needs of the IBBME community*. The Committee created this Manual in order to help clarify individual responsibilities related to safety training requirements and safe activity in the workplace. The committee also oversees annual workplace inspections in an effort to ensure safe work environments for all of our workers. The IBBME Safety Committee has a responsibility to:

- forward updated safety information and policies to IBBME labs accordingly;

- oversee annual internal laboratory/office space safety inspections;
- be available to all staff/workers at the IBBME for advice on safety-related issues;
- conduct an annual review of this manual to assure compliance with University of Toronto and IBBME safety regulations.

Office of Environmental Health and Safety Responsibilities

The Office of Environmental Health and Safety (http://www.ehs.utoronto.ca/site4.aspx) has the responsibility of providing:

- technical advice and recommendations to the University community on matters related to health and safety in the office/laboratory;
- collection and disposal services for hazardous waste;
- Health & Safety training to all employees of the University of Toronto.

5. Safety Training Requirements

Every member of the IBBME is required to participate in comprehensive safety training **BEFORE** they begin working at the Institute. The specific requirements vary, depending upon an individual's status within the Institute (i.e., undergraduate student, volunteer, graduate student, postgraduate researcher, academic staff, administrative staff, technical or support staff, faculty/supervisor) as well as the type of work that is conducted within a defined work area. Many U of T EH&S courses are now available online however you must have a valid UTORid and can only access from campus computers. Please refer to **Table 1** to determine the required training sessions for your type of work.

TRAINING REQUIRED BY ALL MEMBERS OF IBBME: In order to work compliantly in any IBBME workspace, Institute members must complete Health and Safety Online Orientation, WHMIS, and Fire Safety training. These courses are offered online by U of T EH&S. Information on how to register for these courses can be found at http://www.ehs.utoronto.ca/Training/Learning.htm and http://www.ehs.utoronto.ca/Training/training.htm#WHMIS. Fire Safety videos are also accessible online at http://www.ehs.utoronto.ca/resources/videos/videod.htm . **Note: The university U of T does not accept WHMIS training from other institutions and therefore everyone must complete this U of T online session to be compliant.**

Hazardous Waste Disposal education is required for all individuals working within a research laboratory (students, staff, supervisors) although all individuals at the Institute are highly encouraged to familiarize themselves on this safety issue (http://www.ehs.utoronto.ca/resources/wmindex.htm). Training in First Aid is also available to those of interest (http://www.ehs.utoronto.ca/Training/training.htm#First%20Aid).

Table 1. Summary of IBBME Safety Training Requirements (see pages 8 & 9)

Notations: √ = training required; AR = as required

Mandatory IBBME Safety Training Requirements - Effective May 2015

	Departmental					Government		
	IBBME Health & Safety Orientation (IBBME001)	Basic Health & Safety Orientation (EHS900)	Workplace Inspection	CHE Departmental Orientation & Safety (CHE2222)	Fire Safety in the Workplace	Orientation for New Employees (EHS002)	WHMIS (EHS005)	WHMIS Refresher
Employment Descriptor		Required component of IBBME001	Required component of IBBME001	Required for all ChemEng affiliates; refer to ChemEng Safety		Online; U of T portal	Online; U of T portal	Online; U of T portal
Faculty	√	√	√	√	√	√	√	√
Administration*	√	√	√	√	√	√	√	√
Workers**	√	√	√	√	√	√	√	√
Graduate students	√	√	√	√	√	√	√	√
Researchers$	√	√	√	√	√	√	√	√
Visitors & volunteers@	√	√	√	√	√	√	√	√
Location	**In-class**	**Online**	**Online form**	**ChemEng**	**Online videos**	**Online**	**Online**	**Online**
Frequency	**1X**	**1X**	**1X/workplace**	**Refer to ChemEng**	**As required**	**1X**	**1X**	**Every 3 yrs**

* - all adminitrative staff management; ** - all workers, including research staff, summer research students, and Teaching Assistants; $ - all post-doctoral fellows, associates, etc; @ - any visitor or volunteer doing an internship over a 30 day period

Mandatory IBBME Safety Training Requirements - Effective May 2015

	Environment-Specific							Supervisory	
	Animal	**Biosafety**	**Cryogenics**	**Isotope**	**Laser**	**Transportation of Dangerous Good (TDG)**	**Waste Disposal**	**EH&S Lab Academic Supervisor (EHS009)**	**EH&S Supervisor (EHS015)**
Employment Descriptor	**For anyone handling or working with animals or tissues**	**For anyone handling or working with biologics**	**For anyone working with liquid nitrogen**	**For anyone working with isotopes**	**For anyone working with lasers**	**For anyone handling, transporting, or working with dangerous goods**	**For anyone handling or working near laboratory waste; online**	**For anyone supervising another individual in a lab setting; online**	**For anyone supervising another individual in any setting; online**
Faculty	AR	AR	AR	AR	AR	AR	AR	√	√
Administration*		AR				AR			AR
Workers**	AR	AR	AR	AR	AR	AR	AR	AR	AR
Graduate students	AR	AR	AR	AR	AR	AR	AR	AR	AR
Researchers$	AR	AR	AR	AR	AR	AR	AR	AR	AR
Visitors & volunteers@	AR	AR	AR	AR	AR	AR	AR	AR	AR
Location	**Medicine**	**EH&S**	**EH&S**	**EH&S**	**EH&S**	**Online**	**Online**	**Online**	**Online**
Frequency	**5 yrs**	**2yrs**	**Refer to EH&S**	**Refresher every 3 yrs**	**Refresher every 3 yrs**	**1X**	**1X**	**1X**	**1X**

AR = as required

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WORK-SPECIFIC TRAINING: Depending upon the nature of the work being performed, an individual should discern additional specific training that is required for safety compliance (Table 1). Training must be completed before work begins.

Anyone required to work with **animals** is required to take the Short Course on Animal Care (http://medicine.utoronto.ca/research/division-comparative-medicine). Offered by the Department of Medicine, this course is mandatory for all principal investigators, students, lab staff and technicians prior to undertaking any animal research.

Anyone who will be conducting experimental research of a **biological** nature (performing hands-on research, supervising students, or working as a laboratory teaching assistant) should be familiar with the Biosafety Program at U of T (http://www.ehs.utoronto.ca/services/biosafety.htm). All individuals involved in biological research are required to attend and pass the course test for the Biosafety Training course provided by the Office of Environmental Health and Safety (http://www.ehs.utoronto.ca/services/biosafety/training.htm). All information regarding training and specific laboratory regulations pertaining to Biosafety can be found at the following website: http://www.ehs.utoronto.ca/services/biosafety.htm.

Anyone enrolled in or associated with the **Department of Chemical Engineering (ChemEng)** is required to attend the Safety Training course (**CHE2222**) offered by the Chemical Engineering Department. To find out more and to register for the course please go to the following website: http://www.chem-eng.utoronto.ca/services/safety/Straining.htm.

Anyone who will be conducting experimental research involving the use of any form of **radioisotopes** must attend the Safety Training course offered by U of T. All information regarding training and specific laboratory regulations pertaining to use of radioisotopes can be found at the following website: http://www.ehs.utoronto.ca/services/radiation.htm.

Anyone who will be conducting experimental research involving the use of **lasers** must attend the Safety Training course offered by U of T. All information regarding training and specific laboratory regulations pertaining to lasers can be found at the following website: http://www.ehs.utoronto.ca/services/laserhome.htm.

Any individual working in a primarily electrical or mechanical environment should educate themselves by watching the relevant safety videos posted on the EH&S website. Videos regarding electrical safety can be accessed at http://www.ehs.utoronto.ca/resources/videos/videog1.htm#Electrical1. Videos related to mechanical safety can be viewed at http://www.ehs.utoronto.ca/resources/videos/videog1/videog5.htm and http://www.ehs.utoronto.ca/resources/videos/videog1.htm#Handtool.

TRAINING REQUIRED BY ALL SUPERVISORS AT IBBME: The online Supervisor Safety Training course (EHS015) assists supervisory staff at U of T meet their OHSA obligations. This course includes information on the internal responsibility system, legislation, enforcement, duties around health and

safety, due diligence, and incident response amongst other topics (http://www.ehs.utoronto.ca/Training/Learning.htm).

The Laboratory Academic Supervisor Safety Training course (EHS009) was developed to assist academic supervisors meet their OHSA obligations. This online course includes information on setting up labs at U of T, safety requirements for different types of work, legal responsibility of academic supervisors, the internal responsibility system, legislation, enforcement, due diligence, and incident response (http://www.ehs.utoronto.ca/Training/Learning.htm).

6. Required Laboratory Work Forms and Permit Requirements

The supervisor must ensure that all required forms and permits have the necessary approval and are visibly posted within a work/laboratory space **BEFORE** work begins. It is recommended that a supervisor consult with the Safety Committee when establishing a new lab space.

Special Forms and Permits

Special permits are required whenever the work within a lab involves any of the following:

- Radioactive materials (http://www.ehs.utoronto.ca/services/radiation.htm)
- Biohazardous materials (http://www.ehs.utoronto.ca/services/biosafety.htm)
- Designated substances (complete list of substances available at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_090490_e.htm); please contact U of T EH&S directly at (416) 978-4467 regarding required permits.
- Lasers (http://www.ehs.utoronto.ca/services/laserhome.htm)
- Animal use (http://medicine.utoronto.ca/research/division-comparative-medicine)
- Use of human samples or personal information (http://www.research.utoronto.ca/for-researchers-administrators/ethics/human/)

Please consult the specified website for further detailed information.

Table 2. Required forms that must be submitted BEFORE work can begin in the laboratory.

Type of Work	Link to pdf forms and/or further information
Biosafety Certificate	http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/Biosafety/BioApplicationFormv5.pdf
Radiation License	http://www.ehs.utoronto.ca/services/radiation.htm#Permits
Lasers	http://www.ehs.utoronto.ca/services/laserhome.htm#Forms
Animal Use Protocol (AUP)	http://www.research.utoronto.ca/for-researchers-administrators/ethics/animals-in-research/
Ethical Approval	http://www.research.utoronto.ca/for-researchers-administrators/ethics/human/application-forms/ (for use of human samples or personal information)

Constructing a New Laboratory or Renovation of Existing Space

The construction of new laboratories or renovation of old ones must be done in accordance with Capital Projects (Design and Engineering) laboratory design standards. Please refer to the IBBME administration (manager.ibbme@utoronto.ca) directly.

Decommissioning a Laboratory

When a laboratory is being vacated, it must be properly decommissioned. Before a laboratory is vacated, the Institute should contact (as early as possible) the Office of Environmental Health and Safety to assist in planning the decommissioning of the laboratory and ensuring the proper disposal of hazardous biological, chemical and radiological agents in accordance with the University of Toronto Laboratory Decommissioning Procedures (http://www.ehs.utoronto.ca/resources/wmindex/wm6.htm).

7. Workspace/Laboratory Safety Equipment

As appropriate, laboratories must be equipped with or have ready access to safety equipment including fire extinguishers, fume hoods, eyewash units, deluge showers, and flammable storage cabinets:

Fire Extinguishers

Portable fire extinguishers are designed to extinguish or control a small fire. They are not intended to fight a large or spreading fire. Laboratories that use flammable liquids are equipped with multipurpose fire extinguishers, typically marked on the wall adjacent to each doorway. Fire extinguishers are required to be unobstructed, are to be visually checked and their tags initialed by laboratory supervisor/administrators on a monthly basis. Please visit the University of Toronto Fire Prevention website for more details at: http://www.fs.utoronto.ca/utfp.htm.

Fume Hoods

In most laboratories, the fume hood is the primary device for the control of exposures to hazardous substances as it provides containment of operations which may release harmful gases, vapours or aerosols. The University of Toronto Laboratory Fume Hood Standard http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/documents/Lab+Fume+Hood+April+2007.pdf requires that these devices be appropriately selected, installed, used and maintained such that the health of laboratory workers is safeguarded.

Eyewash Units

Eyewash units are required by law in all laboratories where a person is exposed to the potential hazard of injury to the eye due to contact with a biological or chemical substance. These units should be located close to the hazard site and must always be fully accessible to laboratory workers, be maintained properly and tested regularly. For further details, consult the University of Toronto Emergency Eyewash and Shower Standard: http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/Chemical+Safety/Emergency+Eyewash+and+Shower+standard+2009.pdf

Deluge showers

Deluge showers are required by law where a person is exposed to a potential hazard of injury to the skin due to contact with a biological or chemical substance. These units may be located outside the laboratory but must always be accessible to laboratory workers and must be

maintained properly and tested regularly. For further details, consult the University of Toronto Emergency Eyewash and Shower Standard: http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/Chemical+Safety/Emergency+Eyewash+and+Shower+standard+2009.pd

Flammable Storage Cabinets

Flammable storage cabinets are required by law in all laboratories for the storage of flammable liquids that are not required for immediate use. Consult The University of Toronto Flammable Liquids Storage: Standard for Storage Cabinets for information regarding labeling, maximum permissible quantities and good storage practices: http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/Chemical+Safety/Flammable+liquid+storage+standard.pdf.

Refrigerators

Use of domestic refrigerators for storage of highly volatile flammable liquids presents a significant hazard to the laboratory work area. If flammable liquids are to be stored, specially designed "explosion-proof" or "explosion-safe" refrigerators must be used. For further details, consult the University of Toronto Flammable Liquids Storage: Standard for Refrigerators (http://www.ehs.utoronto.ca/resources/manindex/standards/flamfrgstd.htm).

Personal Protective Equipment (PPE)

Wearing proper PPE in the laboratory is mandatory when it is stipulated by policy, procedure or the Material Safety Data Sheet.

Protective Clothing (Laboratory Coats)

Appropriate protective clothing must be worn where the potential for splashes or spills of hazardous substances exists. This clothing must be removed when leaving the laboratory area. The University of Toronto Protective Clothing Standard (http://www.ehs.utoronto.ca/Resources/manindex/standards/clothstd.htm) provides further details regarding the selection and use of appropriate protective clothing. Labcoats should **NOT** be worn outside of the laboratory workspace (i.e., NEVER wear gloves in Institute corridors).

Hand Protection

Gloves must be worn whenever handling hazardous substances that can cause harm to the skin or be absorbed through the skin. Gloves must be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. For further details, consult the University of Toronto Protective Glove Standard (http://www.ehs.utoronto.ca/resources/manindex/standards/glovestd.htm). Gloves should **NOT** be worn outside of the laboratory workspace (i.e., NEVER wear gloves in Institute corridors).

Foot Protection

Appropriate shoes must be worn at all times in laboratories where there is a hazard of foot injury. Perforated shoes, sandals and the like must not be worn in the laboratories. For further details, consult the University of Toronto Foot Protection Standard (http://www.ehs.utoronto.ca/resources/manindex/standards/footstd.htm).

Eye and Face Protection
The University's Protective Eye and Facewear Standard (http://www.civ.utoronto.ca/dept/safety/Legislation_etc/uoft_eye_and_face_protection_policy.html) requires that appropriate protective eyewear be worn by faculty, staff, students and visitors in all situations where there is a potential hazard of injury to the eye/face.

Hearing Protection
The University's Hearing Protection Devices Standard (http://www.ehs.utoronto.ca/resources/manindex/standards/hearstd.htm) requires that appropriate hearing protection be worn by all those who work in noise hazard areas or who have the potential to develop noise-induced hearing loss as a result of their occupation, and where it is not practical or feasible to reduce or eliminate excessive noise exposure in the laboratory by means of engineering controls or work practices.

Respiratory Protection
Respirators provide personal protection either by removing contaminants from the air before they are breathed in (air-purifying respirators), or by supplying breathable air (atmosphere-supplying respirators). The U of T Respiratory Protection Program (http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/Chemical+Safety/Respiratory+Protection+Program.pdf) requires the use of respiratory protection for work which involves exposure to potentially hazardous environments. The use of respirators may be required when engineering control measures are inadequate, during shut down for maintenance or repair, or during emergencies.

8. Material Safety Data Sheets (MSDSs)

Maintaining up-to-date Material Safety Data Sheets (MSDSs) is a legislated requirement (Regulation 860 R.R.O.1990, Workplace Hazardous Materials Information System). All documents contained within a MSDS database must be less than three years old. It is preferable to maintain both online AND paper copies of the MSDSs for chemicals used in your workspace. These documents can be obtained directly from chemical suppliers however U of T EH&S recommends several websites to access relevant information (http://www.ehs.utoronto.ca/resources/info.htm). For more information, contact EH&S at ehs.office@utoronto.ca.

9. Waste Management and Diversion

The University of Toronto manages the disposal of hazardous wastes through Environmental Protection Services (EPS) (http://www.ehs.utoronto.ca/services/environmental.htm) (Office of Environmental Health and Safety) and through Facilities and Services. The hazardous waste disposal procedures, as outlined in the University's Laboratory Hazardous Waste Management Manual (http://www.ehs.utoronto.ca/resources/wmindex.htm), are **mandatory**. It is a serious offence to pour hazardous substances into the drainage system. Laboratory workers must follow

procedures related to the proper disposal of hazardous wastes (http://www.ehs.utoronto.ca/resources/wmindex.htm).

Laboratory Supervisors/Principal Investigators must provide for and enforce the proper disposal of hazardous wastes.

1. **BIOLOGICAL waste generators are responsible for:**
   - collection of biological waste (sharps, liquids, solids) in appropriate containers; (http://www.ehs.utoronto.ca/resources/wmindex/wm5_1.htm);
   - proper labeling (CL 2 & 3) and storage until collected by EPS;
   - For CL 1 waste, use Not Marked autoclave bags, if applicable.

BIOLOGICAL WASTE TYPE:	DISPOSAL:
Dry biological waste (i.e., culture plates, flasks, dishes, etc.)	Yellow Biohazard bin or plastic Biohazard bag
Wet biological waste but **NOT** liquid (i.e., serological pipettes, tips, etc.)	Yellow Biohazard bin **ONLY**
Waste that can penetrate a plastic bag (i.e., micropipette tips, pipettes, etc.)	Yellow Biohazard bin **ONLY**
Sharp biological waste (i.e., razor, needle, etc.)	Yellow Biohazard container for sharps

BIOLOGICAL WASTE NOTES:
Biological waste can be directly placed into yellow buckets with Biohazard labelling. Dry biological waste (i.e., empty cell culture plates, tubs, etc.) that cannot puncture plastic bags can also be placed directly into Biohazard plastic bags, and further disposed into large (100-200 L) Biohazard bins called “totes”. If you are going to dispose biological waste from a Level 2 biohazard laboratory, please double the bags.

Any biological waste that can puncture the plastic bag must be discarded directly into a yellow Biohazard bin. Any biological waste that might contain residue liquid and potentially leak through the bag to contaminate surrounding materials must be disposed directly into a yellow Biohazard bin (i.e., serological pipettes, tips, or Pasteur pipettes used to transfer cell culture medium, etc.).

2. **CHEMICAL** waste generators are responsible for:
   - segregating incompatible combinations of chemical wastes;
   - proper packaging and labeling of chemical waste;
   - proper storage of chemical waste prior to collection;
   - proper disposal of hazardous chemical waste - **DO NOT** flush this waste down drains or mix with the general garbage;
   - Please see http://www.ehs.utoronto.ca/resources/wmindex/wm5_2.htm for details.

3. **RADIATION (ISOTOPE)** waste generators are responsible for:
    - collection of radioactive waste (sharps, liquids, solids) in appropriate containers (see http://www.ehs.utoronto.ca/resources/wmindex/wm5_3.htm);
    - proper labeling of containers, including permit number;
    - storage and shielding prior to collection/removal by EPS.

4. **SHARPS** waste generators are responsible for:
    - separation, packaging and treatment of their laboratory waste prior to its removal and disposal (http://www.ehs.utoronto.ca/resources/wmindex/wm5_5.htm).

10. Lab/Office Security

No matter your workspace, be aware of and post emergency numbers in visible areas. Know where the nearest exit and fire alarm are located. If you are working alone (particularly after hours) ensure that exterior doors and/or main doors are locked. It is also important to ensure that doors are secured/locked when you leave your workspace. Refrain from propping doors open (especially laboratory doors). Lock up laptops or desktops, or secure with locking cables. Always log off your machine when you discontinue working, even if only for a brief period of time. Report any suspicious/unknown individuals to the U of T Campus Community Police (416.978.2222).

For further information regarding Laptop protection and/or Office Safety, refer to www.campuspolice.utoronto.ca/safety/crime-prevention.htm.

11. Emergency Contact and Response

The following list provides examples and/or templates to aid in the implementation of these policies within your own laboratory and/or office workspace. Templates are also available for download from the IBBME website.

- Contact numbers for all personnel posted within the workspace;
- Emergency protocols implemented (emergency #s on phone; Building and Room # on all phones);
- First Aid requirements (2 people/floor should be trained in First Aid; First Aid Kit);
- Evacuation protocols;
- Record keeping for yearly workspace inspections;
- Safety checklists and internal inspection forms for your types of workspace;
- Standard Operating Procedures for methods used routinely within your lab;
- SOPs for Spill procedures (biological, chemical, radioactive etc.);
- Chemical inventory posted by entrance to laboratory spaces.

Other important University of Toronto weblinks:

MSDS Info	http://www.ehs.utoronto.ca/resources/info.htm
Accident Reporting	http://www.ehs.utoronto.ca/resources/wcbproc.htm
Spill Procedures Reporting	http://www.ehs.utoronto.ca/resources/manindex/eps.htm
Biosafety Policies and Procedures	http://www.ehs.utoronto.ca/Assets/ehs+Digital+Assets/ehs3/biomanual/bm.pd

For any emergency, call campus police at **416.978.2222**

12. The Buddy System

It is highly recommended to work using the "Buddy System" (never work alone; always ensure a colleague is working at the same time in the same workspace or nearby). Students should always work with supervision unless the supervisor has approved independent tasks. For any new task occurring within an unsupervised workspace, written permission must be requested AND received from the supervisor in advance (i.e., working unsupervised during the weekend).

13. The IBBME Safety Committee

The IBBME Safety Committee is a direct resource for any member of the IBBME with regards to health and safety in the workplace. The purpose of the Safety Committee is to address safety concerns and policies *specific to the needs of the IBBME*. The committee also oversees annual workplace inspections, as well as maintenance of safe work environments, and forwards suggestions to the administration.

This committee is overseen by two chairpersons (one also being the IBBME representative to the FASE Joint Health & Safety Committee), and encompasses members of the IBBME technical staff, BESA and faculty. Each IBBME-affiliated laboratory also has a safety representative for communication purposes and distribution of information. The committee meets quarterly (4X per year). Minutes of each meeting are available on the IBBME website and the Safety Bulletin Board (outside of the IBBME Graduate Office; MB332), and are archived with the Faculty of Engineering.

2015-2016 Chairperson Contact Information

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