Biosafety Program Manual
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1.0 Biosafety Program Framework

1.1 Regulations

The SFU Biosafety Program, Biosafety Policy and Biosafety Manual have been developed in compliance with all applicable acts, regulations, standards and guidelines from the Public Health Agency of Canada (PHAC), the Canadian Food Inspection Agency (CFIA), and all other provincial and municipal regulatory bodies. Where required, SFU complies with U. S. National Institutes of Health (NIH) guidelines.

1.2 SFU Definition of Biohazards

SFU defines biohazardous materials as biological agents and materials that are potentially hazardous to humans, animals, and the environment. They may include, but are not limited to: known pathogens and infectious agents including bacteria and their plasmids and phages, viruses, fungi, mycoplasmas, parasites, cell lines, certain toxins, animal remains, laboratory animals (including insects) which might harbor such infectious agents, primate body fluids and plant materials. Also included are nucleic acids used in procedures such as recombinant DNA and genetic manipulations. Materials possibly contaminated with infectious agents such as blood or other body fluids or cultured cells are also considered to be biohazards. In addition to infectious agents, potentially hazardous venoms and toxins are classified as biohazards as are materials used in genetic engineering including certain phages, plasmids and genetically modified organisms. Biohazards are classified according to risk level (see Section 2.1) and a level of appropriate containment is applied.

1.3 Biosafety Policy R20.02 and Associated Procedures

The purpose of the Biosafety policy is to ensure the safety of students, faculty, staff, the community and the environment when using biohazardous materials under the auspices of SFU, and to facilitate research, teaching and testing in compliance with all applicable regulations and standards. The policy includes definitions, authority and responsibilities. The associated procedures include considerations of application to use biohazardous materials, Biosafety Committee Terms of Reference, and Biosafety Program Inspection Protocol.

A copy of the Biosafety Policy is provided in Appendix A.

1.4 Biosafety Committee

SFU has an institutional biosafety committee. The committee is made up of SFU faculty, staff, students and external non-SFU representatives. The Biosafety Committee is authorized to oversee the University's Biosafety Program, provide policy direction and recommend changes to the Vice President, Research for all teaching, research and testing activities involving the use of biohazardous materials. The Committee reviews biosafety permit applications for teaching,
research and testing, issues permits, and monitors activities involving the use of biohazardous materials to confirm compliance with the standards in the Biosafety Policy.

The Terms of Reference for the Biosafety Committee are included in the Biosafety Policy.

1.5 Biosafety teaching and research permits

The Principal Investigator¹ (PI) intending to work with biohazardous materials (as defined in SFU policy R20.02) is required to submit a biosafety permit application. Each permit application allows the PI to identify the risks and outline responsibilities of all personnel involved with the project. Each project requires a separate permit but may include more than one title or location. Projects between two or more PI's require the permit application to be submitted by the PI who has the authority to institute changes in the lab. Research Services will not release research funds until a valid Biosafety permit is on file. Note that depending on the project, a PI may also require permits for ethics, animal care, and work with radioisotopes.

SFU’s Biosafety Permit Application is accessed online at https://bio-permits.its.sfu.ca/.

1.5.1 When to apply

A biosafety permit must be approved prior to commencing work with biohazardous material. Allow a minimum of 3 weeks for processing and approval after an application is submitted. A teaching permit must be obtained prior to the start of the course – apply in the semester preceding the course (at least 6 weeks in advance).

1.5.2 Who can apply

Only a PI may apply for a biosafety permit.

In the case of teaching protocols, the faculty member (lecturer) or lab instructor may submit an application for a teaching permit.

A project (joint or otherwise) in which the research is exclusively conducted at another institution will require a copy of that institution’s biosafety permit. In this case, no SFU biosafety permit will be issued.

1.5.3. Application Process

Once the Biosafety Permit Application has been submitted online, it will be checked for completion by the Department of Environmental Health and Research Safety (EHRS) and then forwarded to the Biosafety Committee. To complete the application, the signature page must be printed from the Permit Application system and signed by the PI/lab instructor and sent to EHRS. If the Biosafety Committee deems that a permit is not required, the PI/lab instructor will be notified.

¹ A Principal Investigator is defined in SFU Biosafety Policy R20.02 as the SFU faculty member (or acceptable equivalent as defined in other SFU policies) in charge of a research or teaching project.
1.5.4. Permit Duration

Unless noted on the permit, biosafety permits are valid for four years. During the tenure of the permit, any changes to permit information (grants, procedures, biohazards, personnel, etc.) must be made online in the permit application system (https://bio-permits.its.sfu.ca/). Before the permit expires, EHRS will notify the PI/lab instructor that the permit must be renewed. If work on the project/course has ceased, the PI/lab instructor will notify EHRS and the permit will be closed.

1.6 Training

1.6.1 Principal Investigators

PIs are required to successfully complete the relevant online PHAC (Public Health Agency of Canada) Biosafety Training Modules before a permit is issued. These can be accessed here:


Laboratory Safety Training is also provided by EHRS staff and the Biosafety Officer (BSO) every semester to incoming staff, students, and researchers, including PIs. This training consists of different modules, including a half-day session on biosafety. (Chemical safety, radiation safety, spill response training, and general laboratory safety are covered in other modules). Attendance at the biosafety module is required for all SFU personnel who work with biohazardous materials and attendance at other sessions is strongly recommended. Biosafety training topics include:

- SFU specific policies and procedures,
- Federal regulations and guidelines,
- Overarching and local risk assessments, including risk group and containment level classification,
- Personal protective equipment,
- Emergency response,
- Hazardous waste disposal,
- General safe handling and aseptic techniques,
- General safe use guidelines for common laboratory equipment (e.g. centrifuges, autoclaves, etc.).

In addition to the EHRS Laboratory Safety Training sessions, supervisors or PIs are required to provide all laboratory personnel with research-specific training for all tasks or procedures an individual is expected to complete in the laboratory. Laboratory personnel are required to ask their supervisor or PI if they do not know or are not sure how to safely conduct a specific task in the laboratory. Both the EHRS training and the research-specific training may be supplemented...
by specific PHAC online training modules as required.

All laboratory safety training must be documented, indicating when the training took place, and what training was delivered. This must be acknowledged by having both the trainer and trainee sign or initial the training record. A customizable Laboratory Safety Orientation Checklist is provided in Appendix B that may be used to document training. A copy of each employee/student’s training certificate should be kept on file with the PI.

### 1.6.2 Employees and Students

All employees, graduate students and undergraduate students who will be working with biohazard materials at SFU must attend the EHRS Laboratory Safety biosafety training session. Training sessions are offered at the start of each semester and all units are notified by email regarding the timing and registration for upcoming sessions. All personnel handling biohazards including students and volunteers must also be listed on their PI’s biosafety permit. The general biosafety training must be supplemented by lab-specific training. The PI is responsible for training their employees/students on all lab-specific protocols and procedures, and for documenting that the training took place.

### 1.7 Laboratory Inspections

In accordance with regulations and to ensure that laboratories at SFU are in compliance with all applicable biosafety standards and guidelines, periodic inspections and re-inspections by the BSO and/or their designate(s) are required for all laboratories at SFU storing, handling or using biohazardous materials. These biosafety inspections are in addition to the monthly lab safety self-inspections.

The main criteria used in the inspections are those found in the PHAC and CFIA standards and guidelines. Other guidelines may be imposed as required. Shared labs or rooms with multiple projects at different containment levels will be assessed at the highest containment level assigned to the shared space. Inspection criteria are provided in sections 4.1 and 4.2 of this manual.

Representatives from PHAC or CFIA may also conduct periodic inspections of SFU laboratories that fall under their jurisdiction.

#### 1.7.1 Frequency of inspection

PIs responsible for Containment Level (CL) 1 labs are expected to carry out self-inspection of their labs on an annual basis and to report their findings to the Biosafety Officer. The Biosafety Officer and/or designate will inspect one third of all CL 1 labs per calendar year.

All CL 2 and 3 labs will be inspected at least once per calendar year by the Biosafety Officer and/or designate.
1.7.2 Scheduling the Inspection
An inspection or re-inspection may result from any of the following:
1. A PI may request an inspection;
2. The Biosafety Officer /designate may pre-arrange an inspection with the PI or lab staff;
3. An inspection may be requested by federal or provincial regulatory bodies;
4. An inspection may be unannounced.
Inspections that are pre-arranged between the PI/lab staff and the Biosafety Officer /designate will be scheduled in the month that the PI’s biosafety permit was issued. The PI will be contacted to arrange a time that is convenient for them and their lab staff. If the PI does not respond to the Biosafety Officer’s requests for an inspection, the Biosafety Officer will proceed with an inspection unannounced.

1.7.3 Inspection Procedures
During the inspection, the Biosafety Officer/designate will identify items requiring attention and a written summary of these items will be sent to the PI. The Biosafety Officer will arrange another meeting with the PI to discuss the inspection report and how compliance/conformance can be achieved. A reasonable time frame will be given to the PI to remedy the items requiring attention. A follow-up inspection may be scheduled to determine whether the items requiring rectification were addressed in a timely fashion.

If the lab remains in non-compliance after a follow-up inspection, the inspection results will be forwarded to the Biosafety Committee for review. The Committee will communicate with the PI until such time as the Committee is satisfied the deficiency has been corrected, deems that a third inspection is required, or that alternative action (such as permit suspension) is appropriate. If the permit is suspended, the committee will notify the Vice President, Research and the relevant granting agencies. Note: A permit holder who does not allow their laboratory to be inspected is deemed non-compliant.

2.0 Classification of Biological Agents

2.1 Biological Agent Risk Group Criteria and Categories

Biological agents are classified into risk groups according to their relative hazard. The following criteria are considered when determining the risk group of an organism:

- pathogenicity,
- infectious dose,
- mode of transmission,
- host range,
- availability of effective preventive measures,
- availability of effective treatment.
There are four risk groups (RG) as outlined in the table below.

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<thead>
<tr>
<th>Risk Group</th>
<th>Individual Risk</th>
<th>Community Risk</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td></td>
<td>Unlikely to cause disease in healthy workers</td>
<td>(e.g., many <em>E. coli</em> strains)</td>
</tr>
<tr>
<td>2</td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td></td>
<td>Can cause disease that is easily treatable</td>
<td>Not easily spread (e.g., <em>Legionella</em> spp.)</td>
</tr>
<tr>
<td>3</td>
<td><strong>High</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td></td>
<td>Can cause serious disease that is treatable</td>
<td>Not easily spread by casual contact (e.g., <em>Bacillus anthracis</em>)</td>
</tr>
<tr>
<td>4</td>
<td><strong>High</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td></td>
<td>Can cause serious, often untreatable disease</td>
<td>Is easily transmitted by casual contact (e.g., Ebola virus)</td>
</tr>
</tbody>
</table>

At SFU, we regulate biohazards of all risk groups including RG1 because microorganisms are often cultured in such a way that there may be unknown contaminants (hence an unknown risk). Culturing RG1 organisms can also achieve a high population density (e.g., $10^9$ bacteria/ml) and therefore the potential for workers to be exposed to a high dose of organisms.

Many organisms are considered non-pathogens because they have no means of invading the human body. Lab accidents may provide such means, e.g., injection via needles or broken glass, or exposure to aerosols laden with high concentrations of an organism.

Laboratory growth media may support the growth of a wide variety of organisms, including unexpected contaminants that could be pathogenic. Some organisms used in labs have not been fully characterized and pose unknown hazards.

### 2.2 Containment levels

The classification of organisms into risk groups does not take into account the actual handling of the organisms in the lab. Containment levels are assigned to research projects to provide an indication of the containment required when working with organisms in the lab. The containment system includes the engineering, operational, technical and physical requirements for manipulating a particular pathogen.
The Public Health Agency of Canada defines four containment levels (CL). SFU has facilities for CL1-3. At present, there is only one CL4 facility in Canada at the National Microbiology Laboratory in Winnipeg.

**Containment level 1**

No special design features beyond those suitable for a well-designed and functional science laboratory are required. Work may be performed on the open bench top. Containment is achieved through the use of practices normally employed in the basic microbiological lab.

**Containment level 2**

Agents requiring CL2 facilities are not generally transmitted by airborne routes; however, care must be taken to avoid the generation of aerosols or splashes. Primary containment devices such as biological safety cabinets and centrifuges with sealed rotors must be used. In addition, appropriate personal protective equipment, such as gloves, lab coats and protective eyewear, must be worn.

**Containment level 3**

Agents requiring CL3 facilities may be transmitted by the airborne route, often have a low infectious dose and can cause serious or life-threatening diseases. In CL3 facilities, additional primary and secondary barriers are used to minimize the release of infectious organisms into the lab and the environment. Appropriate respiratory protection, HEPA filtration of exhausted lab air and strictly controlled lab access are also required.

**Containment level 4**

This is the maximum containment available. Agents requiring CL4 facilities have the potential for aerosol transmission, often have a low infectious dose and produce very serious and often fatal disease for which no treatment or vaccine is available. A CL4 facility is an isolated unit that has complete sealing of the perimeter. Individuals are isolated from the pathogen by either a positive pressure suit or containment of the pathogen in a class III biological safety cabinet. All exhaust air is decontaminated by passage through a HEPA filter and all materials leaving the facility are autoclaved or disinfected. As noted above, only one CL4 facility exists in Canada at present.

**2.3 Risk Assessment**

The SFU Biosafety Program is based on an overarching risk assessment that identified the relevant biosafety issues at SFU and the mitigation strategies to be put in place to address those risks. Mitigation strategies include policies and procedures, engineering and administrative controls, and training. Although the RG and CL designations are usually the same for a particular pathogen (i.e., a RG2 agent will require CL2), there are circumstances that can alter the containment level. Therefore, the assignment of CL requires that a detailed local risk assessment be conducted for all work with biohazardous materials. The risk assessment will determine not only the containment level a research project or teaching course requires but also any other specific operational practices. The Biosafety Committee is tasked with
completing a risk assessment based on the information provided in the biosafety permit application. If additional information is required for the Committee to assign a containment level to the work, the PI will be contacted directly.

In addition to the risk group of the biohazardous materials involved in the research or teaching course, the following factors associated with lab operation will be examined:

- quantity,
- concentration,
- potential for aerosol generation,
- agent stability in the environment,
- type of work proposed – in vitro, in vivo,
- use of recombinant organisms,
- other relevant information.

An increase in containment level may be required if it is determined that the work procedures pose a higher risk than routine lab scale manipulations. An increase in containment may also be required if a lab begins large-scale production.

2.4 Pathogen Safety Data Sheets (PSDSs) for Infectious Substances

The Public Health Agency of Canada has published Pathogen Safety Data Sheets (PSDS) for a wide variety of pathogenic microorganisms. The intent of these documents is to provide a safety resource for laboratory personnel working with these pathogens. The PSDS contain health hazard information such as risk group designation, infectious dose, viability (including decontamination), medical information, recommended containment level and precautions, handling information and spill procedures. Please note that PSDS are not available for all pathogens and some of the PSDS are under revision; therefore, other guidelines and the published literature may need to be consulted to obtain the relevant information. One may also contact PHAC directly at standards.normes@phac-aspc.gc.ca for help in determining risk group classification.

The PSDS can be accessed at the following link:


Other guidelines that may provide useful information on risk group designation and safe handling procedures include:

NIH Guidelines

Biosafety in Microbiological and Biomedical Laboratories (BMBL)
3.0 Transfer of Regulated Biohazardous Material

3.1 Controlled Activities

In Canada, any controlled activity that involves human and animal pathogens and toxins is regulated by two federal agencies: the Public Health Agency of Canada (PHAC) and the Canadian Food Inspection Agency (CFIA). The regulations defined by these agencies fall under the authority of the Human Pathogens and Toxins Act (HPTA, 2009), the Human Pathogens and Toxins Regulations (HPTR), the Health of Animals Act (HAA), and the Health of Animals Regulations (HAR). Controlled activities include possessing, handling, using, producing, storing, transferring or importing a pathogen as defined by PHAC and/or CFIA.

SFU has a licence from PHAC to permit SFU personnel to conduct these controlled activities with regulated biohazardous materials, provided they have an SFU-issued Biosafety Permit.

PHAC and CFIA regulate the importation and transfer of human and animal pathogens into Canada. Depending on the nature of material to be imported or transferred, different regulations may apply. As a condition of SFU’s licence to conduct controlled activities with regulated biohazardous materials, the BSO must be notified before arrangements are made to do the following:

- import a human pathogen or toxin;
- receive a human pathogen or toxin from another facility;
- transfer a human pathogen or toxin from another facility.

Please contact the BSO ([http://www.sfu.ca/srs/ehs/research-safety/biosafety.html](http://www.sfu.ca/srs/ehs/research-safety/biosafety.html)) if you plan on importing or transferring regulated materials.

3.2 Imports and Domestic Transfers

SFU users must have a copy of the current SFU license in order to import regulated human pathogens and toxins, and terrestrial animal pathogens from another country, or order them from some domestic suppliers. If a pathogen affects terrestrial animals, a CFIA-issued Compliance Letter may be required. Contact the SFU BSO for assistance if required (give contact info as noted above).

Please be aware that a separate importation permit from the Canadian Food Inspection Agency (CFIA) is required for the following pathogens (these are not regulated by PHAC):

- pathogens that cause a foreign animal disease,
- an emerging animal disease, or
- any terrestrial animal pathogen when imported in a live animal, animal product, or by-product (e.g., blood, serum, tissue, cell line).
3.3 Export Requirements for Biological Agents

Depending on the nature of the material being sent, Transportation of Dangerous Goods (TDG) Regulations may apply. This includes the transport of biohazards from the field to SFU or to another institution. If you are unsure, please contact the BSO (http://www.sfu.ca/srs/eohs/research-safety/biosafety.html), as TDG regulations may apply. Science Receiving can assist you in ensuring that your material can be transported and that it is packaged and documented in accordance with all transport regulations. An import permit may also be required from the country to which the package is being sent – please check with your collaborator.

You are not permitted to mail RG 2, RG3 or RG4 materials in a regular envelope or package either within Canada or internationally, nor are you permitted to carry it on your person on an aircraft or in your luggage. Such actions contravene the Transportation of Dangerous Goods Act and/or the International Aviation Transport Association regulations.

3.4 Transportation of Biological Agents on Campus

Appropriate containers must be used for the transfer of biological agents between labs on campus. The container should provide primary and secondary containment. The primary container must be sealed, leak-proof and puncture resistant. The secondary container must contain enough absorbent material to completely retain all of the contents of the primary container. It must be leak proof, puncture resistant and capable of being securely closed. Containers must have a biohazard symbol when in use. This applies to risk group 1, 2 and 3 biohazards.

3.5 Material Transfer Agreements

Material Transfer Agreements (MTA) are legal documents used by SFU to assume responsibility for the use of material that is transferred to the campus from another research institution or supply house. An MTA is required when another institution requests it prior to sending material to SFU, or when research materials are being sent from SFU.

MTA are legal documents that can only be signed by the Office of Research Services on behalf of the University. They cannot be signed by individual researchers. Research Services can also provide you with material transfer agreement templates and can review agreements sent to you from a colleague elsewhere. A copy of the signed agreement is provided for your records. MTA applications are available from Research Services on their website at https://www.sfu.ca/ors/researchcontracts/material-transfer.html.
4.0 Biological Safety Practices and Procedures

In 2015, PHAC and CFIA published a harmonized national standard for the handling or storing of human and terrestrial animal pathogens and toxins in Canada, the Canadian Biosafety Standard (CBS), 2nd Edition. The CBS outlines and defines the physical requirements and operational procedures required to safely handle or store human and terrestrial animal pathogens and toxins for biosafety CL1, CL2, and CL3 labs. The CBS, 2nd Edition is available online at http://canadianbiosafetystandards.collaboration.gc.ca/cbs-ncb/index-eng.php.

The CBS, 2nd Edition, 2015 updates the biosafety standard originally published as Part I of the Canadian Biosafety Standards and Guidelines (CBSG), 1st Edition, 2013. The CBS and its predecessor, the CBSG, were developed to update and replace the following Canadian biosafety standards and guidelines for the design, construction, and operation of facilities in which pathogens or toxins are handled or stored:

- Human pathogens and toxins: Laboratory Biosafety Guidelines, 3rd Edition, 2004 (PHAC)

The Canadian Biosafety Handbook (CBH), 2nd Edition, 2015. The CBH is the companion to the CBS and outlines how the biosafety and biosecurity requirements outlined in the CBS can be achieved. This was derived from an updated version of Part II of the first edition of the CBSG.

4.1 Operational Requirements for CL1 and CL2*

*Operational requirements for CL3 labs are much more stringent and a formal procedure for CL3 certification exists. Please consult the Biosafety Officer for additional information.

The following operational requirements for CL1 and CL2 are taken from the CBS, 2nd Edition, 2015 and must be met for all CL1 and CL2 labs, respectively.
# Containment Level 1 Lab - Self-Inspection Checklist

**Lab room number:**

**Principal investigator (PI):**

**Biosafety permit number(s):**

**Containment level:**

**Audit date:**

**Auditor:**

**PI's signature:**

## OPERATIONAL PROCEDURES - CL1

### Training

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<th>COMMENTS</th>
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A documented procedural [safety] manual should be available for all lab personnel, and its requirements followed. It is acceptable to use the Laboratory Safety Training Manual prepared by ERHS, however, lab specific procedures should also be documented.

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<th>CBS Req #</th>
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<th>COMMENTS</th>
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<td>4.1.9</td>
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Have all lab personnel attended the Lab Safety Training presentations hosted by EHRS?

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<th>COMMENTS</th>
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In addition to the training mentioned above, lab personnel must receive lab-specific training on the potential hazards associated with their own research and the necessary precautions to prevent exposure to infectious agents and the release of contained material. **A record should be maintained of this training.**

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<th>CBS Req #</th>
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All persons entering the containment area must be trained and know and follow the operational protocols for the project in process; trainees must be accompanied by a trained staff member. Visitors must also be provided with training and/or supervision commensurate with their anticipated activities in the containment area.

### Emergency Procedures

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<td>4.9.7</td>
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All spills, accidents, or exposures to infectious materials and losses of containment must be reported immediately to the lab supervisor. An SFU incident report form must be filled out and sent to EHRS.

### Access

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<th>CBS Req #</th>
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<th>COMMENTS</th>
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<td>3.3.1</td>
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Access to laboratory should be limited to authorized personnel (e.g., laboratory staff, maintenance staff, and other persons on official business).

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<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
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<tbody>
<tr>
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The doors to lab must be kept closed (this does not apply to an open area within a laboratory).

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<tr>
<th>CBS Req #</th>
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<th>COMMENTS</th>
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<tr>
<td>4.5.4</td>
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Entry/exit protocols must be written, posted and followed*.  

---

*Field contains asterisk indicates that this requirement is mandatory.
### Housekeeping

<table>
<thead>
<tr>
<th></th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating, drinking, smoking, storing of either food, personal belongings, or utensils, applying cosmetics, inserting ear buds, and inserting or removing contact lenses are not permitted in any laboratory.</td>
<td>4.6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral pipetting of any substance is prohibited.</td>
<td>4.6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long hair is to be tied back or restrained so that it cannot come into contact with hands, specimens, containers or equipment.</td>
<td>4.6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open wounds, cuts, scratches and grazes should be covered with waterproof dressings.</td>
<td>4.6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratories are to be kept clean and tidy. Storage of materials that are not pertinent to the work and cannot be easily decontaminated (e.g., journals, books, correspondence) should be minimized; paperwork and report writing should be kept separate from such biohazardous materials work areas.</td>
<td>4.6.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you are working with a virus for which a vaccine is available, it must be offered to employees free of charge. Please contact EHRS for a copy of the Vaccination form.</td>
<td>4.1.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Safe Operating Procedures

<table>
<thead>
<tr>
<th></th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands must be washed after gloves have been removed, before leaving the laboratory and at any time after handling materials known or suspected to be contaminated.</td>
<td>4.5.15 and 4.6.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Containers which are leak-proof, puncture resistant, and capable of being securely closed should be used for the transport of infectious materials within facilities (e.g., between labs, to the autoclave room). These containers should be labelled with a biohazard symbol (when in use).</td>
<td>4.6.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic flow patterns from clean to dirty areas must be established and adhered to (i.e. move from least to most contaminated areas).</td>
<td>4.6.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of needles, syringes and other sharp objects should be strictly limited. Caution should be used when handling needles and syringes to avoid auto-inoculation and the generation of aerosols during use and disposal. Needles should not be bent, sheared, recapped or removed from the syringe; they should be promptly placed in a puncture-resistant sharps container before disposal.</td>
<td>4.6.9 and 4.6.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Personal Protective Equipment

<table>
<thead>
<tr>
<th></th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective laboratory clothing (including lab coats), properly fastened, must be worn by all personnel, including visitors, trainees and others entering or working in the laboratory. Suitable footwear with closed toes must be worn at all times in the lab.</td>
<td>4.4.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Protective lab clothing must not be worn in non-lab areas (e.g., lunch room). Lab clothing must not be stored in contact with street clothing. 4.4.1

Where there is a known or potential risk of exposure to splashes or flying objects, eye and face protection must be used. Careful consideration should be given to the identification of procedures requiring eye and face protection. 4.4.2

Gloves (e.g., latex, vinyl, co-polymer) must be worn for all procedures that might involve direct skin contact with biohazardous material or infected animals. Gloves are to be removed when leaving the laboratory and decontaminated with other laboratory wastes before disposal. 4.4.4

<table>
<thead>
<tr>
<th>Decontamination Procedures</th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work surfaces must be cleaned and decontaminated with a suitable disinfectant at the end of the day and after any spill of potentially biohazardous material. Work surfaces that have become permeable (i.e., cracked, chipped, loose) to biohazardous material must be replaced or repaired.</td>
<td>4.6.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminated materials and equipment leaving the laboratory for servicing or disposal must be appropriately decontaminated and labelled as such.</td>
<td>4.8.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All contaminated materials, solid or liquid, must be decontaminated before disposal or reuse. The material must be contained in such a way as to prevent the release of the contaminated contents during removal.</td>
<td>3.7.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disinfectants effective against the agents in use must be available at all times within the areas where the biohazardous material is handled or stored. <strong>Name the disinfectant(s) used.</strong></td>
<td>4.8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminated clothing must be decontaminated prior to laundering.</td>
<td>4.8.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This inspection checklist summarizes the operational requirements for CL1 as dictated by the Canadian Biosafety Standards (CBS), 2nd Ed. (2015).

*A sample entry/exit protocol is provided in Appendix C.*
# Containment Level 2 Lab Inspection Checklist

<table>
<thead>
<tr>
<th>Lab room number:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal investigator (PI):</td>
<td></td>
</tr>
<tr>
<td>Biosafety permit number(s):</td>
<td></td>
</tr>
<tr>
<td>Containment level:</td>
<td></td>
</tr>
<tr>
<td>Audit date:</td>
<td></td>
</tr>
<tr>
<td>Auditor:</td>
<td></td>
</tr>
</tbody>
</table>

## OPERATIONAL PROCEDURES - CL2

### Biosafety Program Management

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A local risk assessment (LRA) to be conducted to examine each task involving infectious material or toxins so that the risks are identified and safe work practices developed and documented.</td>
<td>4.1.8</td>
<td></td>
</tr>
<tr>
<td>A respiratory protection program to be in place when respirators are in use.</td>
<td>4.1.13</td>
<td></td>
</tr>
<tr>
<td>The Biosafety Manual to be supplemented and updated with SOPs specific to the nature of the work being conducted in the containment zone and to each project or activity, as applicable. ([Lab Safety Manual])</td>
<td>4.1.10</td>
<td></td>
</tr>
<tr>
<td>A biosecurity plan, based on a biosecurity risk assessment, to be implemented, evaluated and improved as necessary, and kept up to date.</td>
<td>4.1.11</td>
<td></td>
</tr>
<tr>
<td>Inventory of infectious material and toxins handled or stored in the containment zone to be maintained, and kept up to date. Infectious material or toxins stored outside the CL2 and/or CL3 zones to be included in the inventory.</td>
<td>4.10.2</td>
<td></td>
</tr>
<tr>
<td>Records pertaining to importation requirements to be kept for 2 years following the date of disposal, complete transfer or inactivation of the imported infectious material or toxin, and made available upon request.</td>
<td>4.10.10</td>
<td></td>
</tr>
</tbody>
</table>

### Medical Surveillance Program

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A medical surveillance program, based on an overarching risk assessment and LRAs, to be developed, implemented, and kept up to date.</td>
<td>4.1.12</td>
<td></td>
</tr>
<tr>
<td>Containment zone personnel to immediately notify their supervisor of any illness caused by, or that may have been caused by, the infectious material or toxins being handled or stored. (<a href="https://www.sfu.ca/labsafety/mi">Laboratory Acquired Infection (LAI)</a>)</td>
<td>4.2.2</td>
<td></td>
</tr>
</tbody>
</table>

### Training Program

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A training needs assessment to be conducted.</td>
<td>4.1.9</td>
<td></td>
</tr>
</tbody>
</table>
A training program, based on a training needs assessment, to be implemented, evaluated and improved as necessary, and kept up to date.

Personnel to be trained on the relevant components of the Biosafety Manual/SOPs, as determined by the training needs assessment.

Personnel to be trained on the potential hazards associated with the work involved, including the signs and symptoms of disease caused by the infectious material or toxins in use and the necessary precautions to prevent exposure to, release of, infectious material or toxins.

Personnel to be trained on the relevant physical operation and design of the containment zone and systems.

Personnel to be trained on the correct use and operation of lab equipment, including primary containment devices.

Visitors, maintenance/Janitorial staff, contractors, and others who require temporary access to the containment zone to be trained and/or accompanied in accordance with their anticipated activities in the containment zone.

Personnel to demonstrate knowledge of and proficiency in the SOPs on which they were trained.

Trainees to be supervised by authorized personnel when engaging in activities with infectious material and toxins until they have fulfilled the training requirements.

Review of training needs assessment to be conducted, at minimum, annually. Additional or refresher training to be provided as determined by the review process or when warranted by a change in the biosafety program.

Refresher training on emergency response procedures to be provided annually.

Training and refresher training to be documented; records to be kept on file.

### Personal Protective Equipment

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>宜ROPed PPE (gloves, eye protection, lab coats etc.) specific to each containment zone, to be donned in accordance with entry procedures and to be exclusively worn and stored in the containment zone.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face protection to be used where there is a risk of exposure to splashes or flying objects.</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gloves to be worn when handling infectious material, toxins, or infected animals.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Entry and Exit of Personnel, Animals, and Materials

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.1</td>
<td></td>
<td></td>
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<tr>
<td>Containment zone doors to be kept closed.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to containment zone to be limited to authorized personnel and authorized visitors.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current entry requirements to be posted at entry to containment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Personal clothing (including backpacks and purses) to be stored separately from dedicated PPE. 4.5.10

Personal belongings to be kept separate from areas where infectious material or toxins are handled or stored. 4.5.11

Personnel to doff dedicated PPE (in accordance with SOPs) in a manner that minimizes contamination of the skin and hair when exiting the containment zone. 4.5.14

Personnel to wash hands after handling infectious materials or toxins, and when exiting the containment zone. (One Glove Rule) 4.5.15 and 4.6.27

<table>
<thead>
<tr>
<th>Work Practices</th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact of the face or mucous membranes with items contaminated or potentially contaminated with infectious material or toxins to be prohibited.</td>
<td>4.6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hair that may become contaminated when working in the containment zone to be restrained or covered.</td>
<td>4.6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of footwear worn to be selected to prevent injuries and incidents (LRA), in accordance with containment zone function.</td>
<td>4.6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral pipetting of any substance to be prohibited.</td>
<td>4.6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open wounds, cuts, scratches, and grazes to be covered with waterproof dressings.</td>
<td>4.6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic flow patterns from clean to dirty areas to be established and followed, as determined by an LRA.</td>
<td>4.6.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated paper/computer work areas to be utilized for paperwork and report writing.</td>
<td>4.6.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of needles, syringes, and other sharp objects to be strictly limited and avoided when suitable alternatives are available.</td>
<td>4.6.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bending, shearing, re-capping, or removing needles from syringes to be avoided, and, when necessary, performed in accordance with SOPs.</td>
<td>4.6.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work surfaces to be cleaned and decontaminated with a disinfectant effective against the infectious material in use, or a neutralizing chemical effective against the toxins in use at a frequency to minimize the potential of exposure to infectious material or toxins.</td>
<td>4.6.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSCs, where present, to be certified upon initial installation, annually, and after any repairs or relocation. Certification to include verification of correct operation by in situ testing in accordance with NSF/ANSI 49, or, where not applicable, with manufacturer specifications.**</td>
<td>4.6.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good microbiological lab practices to be employed.</td>
<td>4.6.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samples of infectious material or toxins to be opened only in containment zones that meet the containment level requirements to which that infectious material or toxin has been assigned. (RG2 used in CL2)</td>
<td>4.6.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Containers of infectious material or toxins stored outside the containment zone to be labelled, leak proof, impact resistant, and kept either in locked storage equipment or within an area with limited access.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A certified BSC to be used for procedures that:

- may produce infectious aerosols or aerosolized toxins, when
  aerosol generation cannot be contained through other methods;
- involve high concentrations of infectious material or toxins;
- involve large volumes of infectious material or toxins.

Gloves to be removed before exiting the BSC.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6.26</td>
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</tbody>
</table>

Centrifugation of infectious material where inhalation is the primary route of infection, to be carried out in sealed safety cups (or rotors) that are unloaded in a BSC.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>4.6.28</td>
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</tbody>
</table>

Sustained open flames to be prohibited in a BSC; on-demand open flames to be avoided.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>4.6.30</td>
<td></td>
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</tr>
</tbody>
</table>

Procedures, based on an LRA and in accordance with SOPs, to be in place to prevent a leak, drop, spill, or similar event, during the movement of infectious material or toxins within the containment zone, or between containment zones within a building.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.31</td>
<td></td>
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</tbody>
</table>

Large scale cultures of infectious material or toxins to be contained within a closed system or other primary containment device.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.32</td>
<td></td>
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</tbody>
</table>

Sample collection, addition of materials, or transfer of culture fluids from one closed system to another to be performed in a manner that prevents the release of aerosols or the contamination of exposed surfaces.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.31</td>
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</table>

Experimentally infecting cells or other specimens derived from the person conducting the experiment is prohibited.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.34</td>
<td></td>
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</tbody>
</table>

Containment zone (floors) to be kept clean, free from obstructions, and free from materials that are in excess, not required, or that cannot be easily decontaminated.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An effective rodent and insect control program to be maintained.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.37</td>
<td></td>
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</tbody>
</table>

Personnel to conduct regular visual (monthly) inspections of the containment zone to identify faults and/or deterioration; when found, corrective actions to be taken.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.2</td>
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</tbody>
</table>

Records of regular inspections of the containment zone and corrective actions to be kept on file.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.10.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Records of building and equipment maintenance, repair, inspection, testing or certification, in accordance with containment zone function, to be kept on file.

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.10.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Decontamination and Waste Management**

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.8.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.8.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
available and used in the containment zone.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharps to be discarded in containers that are leak proof, puncture-resistant, fitted with lids, and specifically designed for sharps waste.</td>
<td>4.8.3</td>
</tr>
<tr>
<td>Primary containment devices to be decontaminated prior to maintenance.</td>
<td>4.8.4</td>
</tr>
<tr>
<td>All clothing and PPE to be decontaminated when a known or suspected exposure has occurred.</td>
<td>4.8.5</td>
</tr>
<tr>
<td>Contaminated liquids to be decontaminated prior to release into sanitary sewers.</td>
<td>4.8.7</td>
</tr>
<tr>
<td>Contaminated materials and equipment to be decontaminated and, in accordance with SOPs, labelled as decontaminated prior to cleaning, disposal, or removal from the containment zone.</td>
<td>4.8.8</td>
</tr>
<tr>
<td>Decontamination equipment and processes to be validated (in accordance with SOPs) using representative loads, and routinely verified using application-specific biological indicators, chemical integrators, and/or parametric monitoring devices (e.g., temperature, pressure, concentration) consistent with the technology/method used. (Autoclaves)</td>
<td>4.8.10</td>
</tr>
<tr>
<td>Verification of decontamination equipment and processes to be performed routinely, based on an LRA, and records of these actions to be kept on file. (BIs)</td>
<td>4.8.11</td>
</tr>
</tbody>
</table>

**Emergency Response Planning**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidents involving infectious material, toxins, other regulated infectious material, or infected animals, or involving failure of containment systems to be reported immediately to appropriate personnel.</td>
<td>4.9.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incident investigation to be conducted and documented for any incident involving pathogens, toxins, other regulated infectious material, infected animals, or failure of containment systems or control systems, in order to determine the root cause(s).</td>
<td>4.9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Records of incidents involving pathogens, toxins, other regulated infectious material, infected animals, or losses of containment to be kept on file.</td>
<td>4.10.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This inspection checklist summarizes the operational requirements for CL2 as dictated by the Canadian Biosafety Standards (CBS), 2nd Ed. (2015).

** Safe Operating Instructions for biosafety cabinets are provided in Appendix D. This document should be posted on all BSCs. **
4.2 Physical Requirements for CL1 and CL2

The following physical requirements are taken from the Canadian Biosafety Standard (CBS), 2nd Edition, 2015 and must be met for all containment level 1 and 2 labs.

<table>
<thead>
<tr>
<th>Containment Level 1 Lab - Self-Inspection Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab room number:</td>
</tr>
<tr>
<td>Principal investigator (PI):</td>
</tr>
<tr>
<td>Biosafety permit number(s):</td>
</tr>
<tr>
<td>Containment level:</td>
</tr>
<tr>
<td>Audit date:</td>
</tr>
<tr>
<td>Auditor:</td>
</tr>
<tr>
<td>PI’s signature:</td>
</tr>
</tbody>
</table>

### PHYSICAL REQUIREMENTS - CL1

#### Laboratory Location and Access

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.1</td>
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</table>

#### Containment Perimeter

<table>
<thead>
<tr>
<th>CBS Req #</th>
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</tr>
</thead>
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#### Laboratory Services

<table>
<thead>
<tr>
<th>CBS Req #</th>
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<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
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This inspection checklist summarizes the CL1 physical requirements as dictated by the Canadian Biosafety Standards (CBS), 2nd Ed. (2015).
# Containment Level 2 Lab Inspection Checklist

<table>
<thead>
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<tr>
<td>Biosafety permit number(s):</td>
<td></td>
</tr>
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<tr>
<td>Audit date:</td>
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<tr>
<td>Auditor:</td>
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</table>

## PHYSICAL REQUIREMENTS - CL2

### Structure and Location

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<tbody>
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<td></td>
</tr>
<tr>
<td>3.1.2</td>
<td></td>
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</tr>
</tbody>
</table>

- Containment zones to be separated from public and administrative areas by a door.
- Dedicated paper/computer work stations within the containment zone to be segregated from laboratory work stations.

### Containment Barrier

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.1</td>
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</tbody>
</table>

- Openable windows positioned on the containment barrier are to include effective pest control and security.

### Access

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1</td>
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</table>

- Doors to the containment zone to be lockable.
- Biohazard warning signage (including the international biohazard warning symbol, wet-mop sign, containment level, name and telephone number[s] of contact person, and entry requirements) to be posted at the containment zone point[s] of entry.
- Space to be provided for the storage of PPE in use.

### Surface Finishes and Casework

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1</td>
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</table>

- Surfaces including and interior coatings, including but not limited to, floors, ceilings, walls, doors, frames, casework, benchtops, and furniture, to be cleanable, non-absorbent, and resistant to scratches, stains, moisture, chemicals, heat, impact, repeated decontamination, and high pressure washing, in accordance with function.
- Floors to be slip-resistant in accordance with function.

### Air Handling

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1</td>
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</table>

- Inward directional airflow (IDA) to be provided where:
  - pathogens that are primarily infectious through inhalation are handled; or
  - infectious aerosols or aerosolized toxins may be generated.
Where (IDA) is provided, exhaust air to be:
- passed through a filter that prevents the release of infectious material or toxins;
- Or 100% exhausted directly to the outdoors.

### Facility Services

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.10</td>
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</table>

#### Essential Biosafety Equipment

<table>
<thead>
<tr>
<th>CBS Req #</th>
<th>Yes/No</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6.4</td>
<td></td>
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<tr>
<td>3.6.6</td>
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</tbody>
</table>

Certified BSCs and other primary containment devices to be provided, based on work activities.

Process equipment, closed systems, and other primary containment devices to be designed to prevent the release of infectious material or toxins.

BSCs, where present, to be located as far as possible from high traffic areas, doors, openable windows, and air supply/exhaust diffusers

Decontamination technologies for the decontamination of materials to be provided within the containment zone, or standard operating procedures (SOPs) to be in place to safely and securely move or transport waste out of the containment zone to a designated decontamination area. (Autoclaves)

Vacuum systems to be equipped with a mechanism that prevents internal contamination. (Aspirators)

This inspection checklist summarizes the CL2 physical requirements as dictated by the Canadian Biosafety Standards (CBS), 2nd Ed. (2015).
4.3 CL2+ Facilities (CL2 physical containment with CL3 operational requirements)

CL2+ facilities must satisfy CL 2 physical and operational requirements and use additional containment level 3 operational practices as follows:

- All activities with infectious materials are conducted in a BSC. If this is not possible, other primary containment devices in combination with personal protective clothing and equipment must be used; no work with open vessels containing infectious materials is conducted on the open bench.

- Centrifugation of infectious materials must be carried out in closed containers placed inside sealed safety cups. Cups and their containers must be loaded and unloaded in a BSC.

- The use of needles, syringes and other sharp objects is strictly limited because many of the pathogens requiring the additional CL3 operational procedures are transmitted through the percutaneous route of infection.

- An additional layer of protective clothing (i.e., solid-front gowns with tight-fitting wrists, gloves, respiratory protection) may be worn over laboratory clothing when infectious materials are directly handled and should be removed after completion of work (e.g., dedicated for use at the BSC).

- A protocol specific to the operation of the laboratory while in CL3 operational mode must be developed and read by all personnel and employees must certify in writing that they have understood the material in the protocol. General protocols must be supplemented with specific operating protocols (SOPs) that provide detailed descriptions of the experimental methods used in the CL3 operational mode.

4.4 Biological Safety Cabinets

Biological safety cabinets (BSCs) provide effective primary containment for work with biohazardous materials by containing bioaerosols. BSCs must be used in all work with RG2 or RG3 agents that has the potential to create aerosols (e.g., opening and closing tubes, pipetting, vortexing, etc.).

*Important: A laminar flow hood is not a BSC. Although it provides a sterile work area, it does not protect the operator.

There are three classes of BSCs: Class I, Class II and Class III. The table below outlines the characteristics of Class II BSCs, which are used at SFU.
Table summarizing the properties of Class II BSCs which are used at SFU.

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Chemical fume hood</th>
<th>Laminar flow hood (clean bench)</th>
<th>Biosafety Cabinet Class</th>
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<td>Old Classes</td>
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<td>none</td>
<td>IIA</td>
</tr>
<tr>
<td>New Classes*</td>
<td></td>
<td></td>
<td>IIB1</td>
</tr>
<tr>
<td></td>
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<td>IIB2</td>
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<td></td>
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<td>IIB3</td>
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<td></td>
<td>B1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>B2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A2</td>
</tr>
</tbody>
</table>

- May be used with Risk Group 1, 2, or 3 organisms: no, no, yes, yes, yes, yes, yes
- May be used with Risk Group 4 organisms: no, no, no, no, no, no, no
- May be used with chemicals only: yes, no, no, no, no, no, no
- May be used with infectious materials and small quantities of volatile toxic chemicals or radionuclides: no, no, no, yes, yes, no, no
- Protects worker from infectious aerosols: not appl, no, yes, yes, yes, yes, yes
- Protects Product from airborne contamination in lab: not appl, yes, yes, yes, yes, yes, yes
- Percent of air recycled in cabinet: not appl, not appl, 70, 30-50, 0, 70, 70
- Number of HEPA filters that "contaminated" air passes through prior to re-entering the cabinet workspace: not appl, not appl, 1, 2, not appl, 1
- Number of HEPA filters that "contaminated" air passes through prior to discharge to duct or room: not appl, not appl, 1, 2, 1, 1
- Relative cost (1-low, 5-high): not appl, not appl, 2, 4, 3, 2

* In accordance with NSF/ANSI Standard 49-2002

Adapted from Laboratory Control and Safety Solutions Application Guide, Landis & Gyr 1993, and from Biosafety in Microbiological and Biomedical Laboratories, US Dept of Health, 1999

Briefly:

- Class I cabinets have un-recirculated airflow away from the operator that is discharged to the atmosphere after filtration through a HEPA filter. They provide good operator protection but do not protect the material within the cabinet (the 'product') from contamination.

- Class II cabinets are designed for personnel, product and environmental protection. They are divided into two types, A and B, based on construction type, airflow velocities and patterns and exhaust systems. Within type A, there are two subtypes: A1 and A2. Within type B, there are two subtypes: B1 and B2.
Class III cabinets are totally enclosed and gas-tight with HEPA filter supply and exhaust air. Work in the cabinet is performed with attached gloves. These cabinets are designed for work with level 4 pathogens.

Additional information can be found in the SFU lab safety training manual.

Safe Operating Instructions for biological safety cabinets are provided in Appendix D. These instructions should be posted on all BSCs on campus.

4.4.1 Open Flames in BSCs

At SFU, although some BSCs are equipped with a natural gas supply, the use of open flame from Bunsen burners in BSCs is strongly discouraged, as it because it interrupts the protective sterile air current in the BSC, and may lead to exposing the user to aerosolized biohazardous material, and/or may contaminate their samples or research. This guidance on this issue has been published by PHAC, NIH, and the US Center for Disease Control (CDC). For example, the CDC states that:

"Open flames are not required in the near microbe-free environment of a biological safety cabinet. On an open bench, flaming the neck of a culture vessel will create an upward air current which prevents microorganisms from falling into the tube or flask. An open flame in a BSC, however, creates turbulence which disrupts the pattern of HEPA-filtered air supplied to the work surface.

When deemed absolutely necessary, touch-plate microburners\(^2\) equipped with a pilot light to provide a flame on demand may be used. Internal cabinet air disturbance and heat buildup will be minimized. The burner must be turned off when work is completed. Infrared heat sterilizers\(^3\) are available for decontaminating bacteriological loops and needles and are preferable to an open flame inside the BSC. Disposable sterile loops can also be used."

4.4.2 Certification of BSCs

BSCs must be certified when first installed and then on an annual basis. If the cabinet is repaired or relocated, it must be re-certified prior to use. A list of approved BSC certifiers is available on the EHRS webpage at:

http://www.sfu.ca/srs/ehs/research-safety/biosafety/biosafety-equipment/biosafety-cabinets.html

A copy of the certification report must be kept on file and a copy sent to the EHRS office.

\(^2\) For example, the Touch-O-Matic or Fireboy EcoSafety Burner from Fisher Scientific

\(^3\) For example, the Bacti-Cinerator IV Sterilizer from Fisher Scientific
4.5 Needles and Syringes

Needles and syringes should be avoided whenever possible. If they must be used, syringes must **never be recapped**. They must be discarded into the appropriate biohazard sharps containers.

In accordance with WorkSafeBC’s Occupational Health and Safety Regulation, any medical procedure that involves the use of hollow bore needles requires safety-engineered needles or needleless systems. These procedures include:

- Withdrawal of body fluids,
- Accessing a vein or artery,
- Administration of medications or fluids,
- Any other procedure, for example immunization, involving the potential for an exposure to accidental parenteral contact for which a needleless system or safety-engineered needle system is available.

4.6 Medical Surveillance and Vaccinations

Part of the risk assessment conducted when a new permit is reviewed is the need for additional medical surveillance of the personnel working with the controlled materials. Employees who will be working with a virus for which a vaccine is available are entitled to have the cost of the vaccination covered by their immediate supervisor (i.e., the PI). This includes all employees who will be working with human blood or body fluids (except urine). There is the potential of contracting Hepatitis B from human blood or body fluids therefore all employees working with human blood or body fluids should be offered the Hepatitis B vaccination. Tetanus vaccinations are also recommended for laboratory personnel who may be using sharps. A vaccination acknowledgement form must be signed and is available on the EHRS website.

4.7 Signage

All labs working with risk group 2 organisms must display the biohazard symbol on the lab door (adjacent to the chemical hazard sign). In addition, all biohazardous waste receptacles that are used for level 1 and 2 biohazardous waste must be labeled with a biohazard symbol.

All labs are expected to display a chemical hazard sign on their lab doors if they are working with chemicals. These signs must be updated on an annual basis. Additional information is provided on the EHRS webpage detailing the SFU door signage program.
5.0 Waste Management

5.1 General Information

Hazardous waste disposal is regulated federally through Environment Canada and the Public Health Agency of Canada, provincially through the Ministry of the Environment and locally through the GVRD Sewer-Use Bylaw. It is SFU’s policy to comply with all legislation to protect the environment.

Some implications of these laws are:

- Disposal of hazardous materials down the drain is prohibited.
- All hazardous materials designated for disposal must be properly labeled and packaged in suitable containers.
- Every person that may use, handle or dispose of waste must be informed of the proper methods of disposal.

5.2 Biohazardous Waste

At SFU, RG1 and RG2 biohazardous waste have their own separate waste stream. The two waste disposal protocols are specific to SFU and these were implemented to prevent adverse ecological and environmental impacts attributed to poor hazardous waste disposal practices, and to enhance personal safety. Biohazardous waste disposal is regulated at the municipal, provincial and federal level. Non-compliance with all disposal regulations can lead to financial penalties, the suspension of permits and/or the university license. The Biosafety Permit held by the PI outlines the waste disposal procedures that must be followed. If you’re unsure whether to follow the RG1 or RG2 procedure, consult the PI or the BSO.

Biohazardous waste from RG1 or RG2 must be disposed of using the SFU specified autoclave bags and bag holders. The colour of bags used is based on the containment level required for the research project:

- Level 1 waste must only be placed in the clear autoclave bags.
- Level 2 waste must only be placed in the orange autoclave bags.

All biohazard bags (RG1 and RG2) must be placed in a labeled bag holder, either a metal rack or a sturdy plastic container labeled with a biohazard sign. Once full, all bags must have a piece of autoclave tape adhered to the bag. Tape with hatched markings should be used for RG1 waste. Tape with the word “autoclaved” should be used for RG2 waste. The bags should be loosely closed to allow steam penetration into the bag.

RG1 Biohazardous Waste Procedure
RG 1 waste is picked up on a regular basis from individual labs for autoclaving off-site. Please follow the instructions below for preparing your RG1 biohazardous waste for pick-up:

1. Collect RG1 waste in the colorless autoclave bags (available at Science Stores). When full, seal the bag loosely with “hatched” autoclave tape.

2. Decontaminate the outside of the bag with a suitable disinfectant and affix a label to the bag indicating that it is RG1 biohazardous waste.

3. Place the bag in your lab’s designated bin for hazardous waste pickup.

4. Use the online request system to request pickup: http://hazmatwaste.its.sfu.ca. Requests may be made for a single pickup or a recurring (weekly) pickup.

Currently, hazardous waste collection is scheduled at the Burnaby campus every Tuesday and Friday between 10:00 am and noon. Surrey campus collection is every Thursday between 10:00 am and noon and Vancouver campus pickups are scheduled as needed. To ensure a timely pickup, a contact person should be available on the requested pickup day and time.

**RG2 Biohazardous Waste Procedure**

RG2 waste must be first autoclaved on site prior to pick up by a commercial company.

1. Collect RG2 waste in the orange autoclave bags (available at Science Stores). The bag must be placed in a labeled bag holder with a biohazard sign.

2. When full, seal the bag loosely with autoclave tape. Tape with the word "autoclaved" must be used for all RG2 waste.

3. Decontaminate the outside of the bag with a suitable disinfectant and take the bag to your lab’s designated autoclave room using appropriate secondary containment.

4. All RG2 biohazardous waste must be autoclaved and then placed in the designated bins in each autoclave room for pickup by the waste disposal company. Follow the departmental procedure for autoclaving RG2 biohazardous waste. If you do not know the procedure or have not been trained in autoclave use, please ask for help.

The following lists the individuals who oversee autoclave operations in the various departments at the Burnaby campus:

<table>
<thead>
<tr>
<th>Location</th>
<th>Department</th>
<th>Contact</th>
<th>Local</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSB 6113</td>
<td>MBB</td>
<td>Neil Dobson</td>
<td>23021</td>
<td><a href="mailto:nda15@sfu.ca">nda15@sfu.ca</a></td>
</tr>
<tr>
<td>B8213</td>
<td>Biology</td>
<td>David Qu</td>
<td>23785</td>
<td><a href="mailto:dqu@sfu.ca">dqu@sfu.ca</a></td>
</tr>
<tr>
<td>K9605</td>
<td>BPK</td>
<td>Haruyo Kashihara</td>
<td>24974</td>
<td><a href="mailto:kashihar@sfu.ca">kashihar@sfu.ca</a></td>
</tr>
<tr>
<td>BLU-9805</td>
<td>Health Sciences</td>
<td>Lingling Zhang</td>
<td>28627</td>
<td><a href="mailto:lza43@sfu.ca">lza43@sfu.ca</a></td>
</tr>
</tbody>
</table>

Please refer to section 6.1 for additional information regarding the safe use of autoclaves on campus.
Disposal of Large Volumes of Biohazardous Liquid Waste

To dispose of large volumes of liquid waste (e.g., cell culture media), aspirate the liquid into a large side arm flask that contains sufficient volumes of freshly-prepared bleach solution to oxidize and kill any pathogens. After a waiting period to allow bleach action (30 minutes or when a conversion of the red-colored media to clear occurs), the liquid is then dumped with large volumes of running water down the drain.

Biohazardous and Radioactive Waste

Do not autoclave radioactive materials. Please consult the Radiation Protection Officer in EHRS for information on disposal of radioactive materials.

Biohazardous and Chemically Toxic Waste

Toxic and/or volatile chemicals cannot be autoclaved. Biohazardous materials that are contaminated with chemicals should be destroyed first by sterilizing with bleach in a fume hood. The inactivated, biohazardous waste can now be treated as chemical waste. If bleach cannot be used for sterilization, please consult EHRS.

5.3 Nucleic Acids

Microorganisms in the environment are capable of incorporating genes from naked nucleic acids. Many of the genes that researchers work with at SFU are potentially harmful in the environment (e.g., antibiotic resistance genes, pathogenicity genes and transgenic plant genes). The safest policy is to dispose of nucleic acids as biohazardous materials. The flow chart below should be followed for disposal of nucleic acids on campus.
5.4 Sharps and Needles

Sharps containers are designed to contain needles, scalpel blades, razor blades, and similar items. All used sharps must be placed in the appropriate sharps container. Sharps contaminated with biohazardous materials (RG1 and RG2) should be placed in the red sharps containers. Sharps which are contaminated with both biohazardous material AND radioisotopes should be placed in the designated red sharps container and affixed with a yellow radioactive waste tag. Sharps which are contaminated with radioisotopes ONLY should be placed in yellow sharps containers and affixed with a yellow radioactive waste tag. Sharps which are neither biohazardous nor radioactive should be placed in the yellow sharps containers. The following table provides a summary and additional information.

Before autoclaving, place autoclave tape on top of the sharps container. Do not cover the hole at the top of the container. Do not autoclave biohazardous radioactive sharps - please consult with EHRS and Radiation Safety for disposal.
### 5.5 Blood, Body Fluids and Biomedical Waste

Blood and body fluids may contain pathogens and therefore may be treated as biohazards, depending on the animal from which they originated. For example, clean samples from humans are treated as biohazard level 2 as are many samples from birds. However, fluids from uninfected fish are not treated as biohazards. Protocols for handling and disposal of these potentially infectious samples may be obtained upon consultation with EHRS. Specific lab protocols will need to be established to receive the required permits.

Biomedical and pathological waste that is generated in Health Services must be treated as biohazardous waste if it is heavily soiled (e.g. bandages or dressings which are dripping blood). This waste must be collected in orange autoclave bags, autoclaved on site and stored in a plastic bin for pick-up by the waste disposal company.
5.6 Animal and Fish Carcasses

Animal and fish carcasses should be placed in heavy (high mil number) plastic bags and stored in a designated tissue freezer. The Anatomical Biohazardous Waste label is used to identify the contents, and to designate as either level 1 or level 2. Labels are available at Science Stores and through EHRS. See the Guideline for Hazardous Waste Labelling for more information.

Staff from the Animal Resource Centre will pick up the packaged tissues directly from the freezer and will arrange for their disposal. Radioactive carcasses must be held for decay before disposal. Please contact the Radiation Protection Officer in EHRS for additional information.

5.7 Glass Waste

Broken glassware, glass tubes, vials, ampoules, Pasteur pipettes, microscope slides and microscope cover slips contaminated with biohazards should be autoclaved or bleached in a sturdy means of containment, then disposed of with regular broken glassware in the plastic liner of the glass waste cardboard container (provided by SFU janitorial services). If it’s not possible to safely decontaminate, dispose of the glass in the appropriate biohazardous sharps containers, as per risk group (RG) level. Glass waste contaminated with RG1 material would be treated as Biohazardous Level 1 sharps waste and glass waste contaminated with RG2 material would be treated as Biohazardous Level 2 sharps waste. Please see the “sharps container table” on page 34 for more information.

Microscope slides with fixed material are no longer biohazardous and can be disposed of with regular broken glassware. If the material is live/frozen then the slides are still considered biohazardous. If the material is not sealed behind the coverslip, the slides may be autoclaved or bleached. If the material on the slide is sealed, then the slides may be disposed of in an appropriate biohazardous sharps container, as per RG level.

Non-broken glassware for disposal should also be placed in the in the plastic liner of the glass waste cardboard container (provided by SFU janitorial services).

6.0 Sterilization and Decontamination

All materials and equipment that are contaminated with biohazards must be decontaminated prior to disposal. Decontamination includes both sterilization and disinfection.

Sterilization is the complete destruction of all microorganisms, including bacterial spores. Sterilization of biohazardous waste, instruments and glassware can be accomplished by the use of an autoclave.

Disinfection is the destruction and removal of specific types of microorganisms. Chemical disinfectants are used for the decontamination of surfaces and equipment that cannot be autoclaved. The effectiveness of a disinfectant is limited by a number of factors, including the presence of organic material, temperature, relative humidity, concentration, and contact time.
6.1 Disinfection

Microorganisms vary in their susceptibility to the action of chemical disinfectants. The most susceptible are vegetative bacteria, fungi and enveloped viruses. Mycobacteria and non-enveloped viruses are less susceptible. Bacterial spores and protozoan cysts are generally the most resistant to chemical disinfectants. A table is provided below that outlines the capabilities and limitations of the different classes of chemical disinfectants. Pathogen Safety Data Sheets (PSDS) from PHAC may provide useful information on disinfection or sterilization of specific pathogens.

Household bleach must be disinfecting bleach with a 5.25% (52500 ppm) concentration of sodium hypochlorite (NaOCl). Please ensure that the bleach being used has the word “disinfecting” on the bottle.

If bleach is used for disinfectant baths and to kill supernatants, a 1:5 (20%) aqueous dilution of household bleach giving 1% (10500ppm) NaOCl is suitable. If bleach is being used to sanitize surfaces, the surfaces should be cleaned with detergent and water first, then wiped with a 1:50 (2%) aqueous dilution of household bleach to provide 0.1% (1050ppm) NaOCl. Bleach can also be used on spills but it corrodes metal so ensure the area is well rinsed after cleaning up a spill with bleach. Please note that working dilutions of bleach must be prepared daily as aqueous solutions of bleach decompose rapidly. It is also important to note that organic matter such as tissue, blood, feces can inactivate bleach.

Counters and metal surfaces need to be cleaned with mild detergent followed by 70% alcohol. Phenolics are sometimes used in disinfectant baths. Gluteraldehyde is used to disinfect delicate equipment in hospitals. Formaldehyde gas is used to disinfect an entire sealed room.
## Disinfectants

<table>
<thead>
<tr>
<th></th>
<th>Quaternary ammonium</th>
<th>Phenols</th>
<th>Chlorinated</th>
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<th>Alcohols</th>
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<td><strong>Disinfecting Properties</strong></td>
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<tr>
<td>Bacteria</td>
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<tr>
<td>Bacterial spores</td>
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<td>Fungi</td>
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<td>(+)</td>
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<td>Viruses</td>
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<tr>
<td>Lipo-viruses</td>
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<td>+</td>
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## Chemical Properties

<table>
<thead>
<tr>
<th>Active concentration</th>
<th>0.1-2%</th>
<th>1-5%</th>
<th>10500 ppm (1%) NaOCl**</th>
<th>25-1600 ppm</th>
<th>70-85%</th>
<th>0.2-8%</th>
<th>2%</th>
</tr>
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<tr>
<td>Shelf life (diluted)</td>
<td>week</td>
<td>week</td>
<td>1 day</td>
<td>week</td>
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<td>week</td>
<td>week</td>
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<tr>
<td>Corrosive</td>
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<td>+</td>
<td>+</td>
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<td>-</td>
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<tr>
<td>Flammable</td>
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<td>-</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Inactivated by organic matter</td>
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<td>+</td>
<td>+</td>
<td>-</td>
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<td>-</td>
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<td>Skin irritant</td>
<td>+</td>
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<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Eye irritant</td>
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<td>+</td>
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<tr>
<td>Respiratory irritant</td>
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<tr>
<td>Toxic</td>
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<td>+</td>
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<tr>
<td>For use with liquid waste</td>
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<td>-</td>
<td>+</td>
<td>-</td>
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<td>For use on glassware</td>
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<td>+</td>
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<tr>
<td>For use on surfaces</td>
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<td>+</td>
<td>+</td>
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<td>+</td>
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</tbody>
</table>

### Examples

| hyamine | lysol | bleach* | ioprep | ethanol/iso-propanol | sterac | cidex |

*Clorox® household bleach contains a 5.25% or 52500ppm concentration of sodium hypochlorite (NaOCl)

**Household bleach diluted 1:5 (20%) will give 1% NaOCl (10500 ppm NaOCl) suitable for disinfectant baths and to kill supernatants.
6.2 Autoclaves

Autoclaves use steam under high pressure to destroy microorganisms by denaturing proteins and nucleic acids. This is the fastest and one of the most effective means of sterilization available, although it is not suitable for all materials. Organisms are killed in an exponential fashion and therefore the exposure time required depends on the rapidity with which the steam is able to penetrate and heat the materials, as well as the overall microbial load.

Autoclaves can be found in several locations on campus. The four main locations are B8213, SSB 6113, K9605, and BH 9805. There are several other autoclaves that belong to specific research or teaching labs but are only used for glassware sterilization. Section 5.2 above lists the contact personnel for autoclaves on the Burnaby campus.

Specific autoclave operating instructions are provided in Appendix E. The following general rules must be followed by all autoclave users:

- Use autoclave tape with every load to ensure that the autoclave was turned on (note: this tape is not an indicator of sterility).
- Maintain records of each autoclave run, including the time, temperature, and pressure. A log book is provided in each autoclave room for this purpose.
- Use biological indicators (e.g., *Bacillus stearothermophilus* spores) at least weekly for autoclaves that are used for decontamination. Tests are conducted by the individuals listed in Section 5.2 who record all results on the Bio-Indicator Test Results form (Appendix G). Any unusual results must be reported immediately to the department Administrative Officer and to EHRS.
- Before using this equipment, all autoclave users must be adequately trained in the safe use and operation of the autoclave including the quality control program. Training records of autoclave users must be maintained by each department
7.0 Emergency Procedures

7.1 Biohazard Spill Response Procedures

For minor spills (e.g., up to 10 ml of a risk group 1 agent, a few ml of a risk group 2 agent), follow the clean up procedure noted below. No incident report is required for minor spills unless an injury occurred. For major spills, complete the initial response and clean up procedures listed below.

If you are not able to clean up the spill, or it is unsafe to do so because of the material spilled or the quantity of material spilled, evacuate the lab, post a “Do not enter” sign on the door, and contact Campus Security (778-782-4500) and Environmental Health and Research Safety (778-782-6740).

INITIAL RESPONSE

1. If safe to do so, shut off any portable air conditioning units and desk fans that may be running.
2. Evacuate the lab if there is potential for aerosol generation from the spilled material. Spills in biosafety cabinets will likely be contained within the cabinet.
3. Post a “do not enter” sign on the door.
4. Secure corridor near lab entrance with “do not enter” tape.
5. Assess whether people or clothing require treatment for exposure to hazardous organisms.
6. Consult with supervisor.
7. Consult with lab coordinator.
8. Allow 60 minutes for aerosols to settle before initiating clean-up.

CLEAN UP

1. Wearing gloves, mark the spill perimeter with a grease pen, non-permanent marker or masking tape. Use wide margins: some evaporation may have occurred on flat and vertical surfaces.
2. If the spill is in a piece of equipment, unplug it, and post a notice.
3. Set up the disposal bucket with a plastic bag liner.
4. Do not recap or bend needles; using tongs, place them in a sharps container.
5. Remove broken glass with tongs into an autoclavable container for autoclaving.
6. If practical, begin cleaning upper surfaces and vertical surfaces before floors.
7. Soak paper towels in decontaminant such as bleach and lay them over the perimeter of the spill. Continue addition of decontaminant-soaked paper towels, moving towards the centre of the spill.

8. Place dry paper towels on top to soak up remaining liquid and apply more disinfectant. Keep spill area covered with decontaminant for 30 minutes.

9. Use tongs to transfer paper towels from spill to lined bucket and wipe up until all material is absorbed and the area is dry.

10. Add more decontaminant to the bucket to ensure all organisms are killed.

11. Place bucket in a fume hood for venting for 24 hours and wash hands.

12. After 24 hours, lift out bag and while standing over a sink with running water, poke a hole in the bottom of the plastic bag to drain the decontaminant.

13. Place the drained plastic bag with solids into the waste disposal container. If using an autoclave bag, do NOT dispose of in regular garbage. Instead, the waste in autoclave bags needs to be picked up by the hazardous waste contractors. Submit a pickup request at: https://hazmatwaste.its.sfu.ca

14. Wash hands.

DOCUMENTATION

Complete an SFU incident report form, available on the Environmental Health and Research Safety website or Security website:

http://www.sfu.ca/incidentreporting

If an employee visited a physician, or was absent beyond the day of the incident (due to the incident), then the supervisor completes a WorkSafeBC Form 7.

7.1.1 Biohazard Spill Kit

The Biohazard Spill Kit should be geared toward the type of biohazards you are working with and should include, but is not limited to:

- Biohazard Spill Clean-up instructions (photocopy from the Lab Safety Manual or use this document.)
- Gloves and goggles for 2 people
- Disposable shoe covers (booties or large plastic bags + strings)
- Absorbent paper towels, or other absorbent material
- All-purpose disinfectant, such as bleach.
- Bucket (can be used to store the spill kit)
- Tongs and/or forceps for picking up broken glass/contaminated sharps/paper towels
• Sharps container if you use sharps frequently
• Sturdy plastic bags (6 mill), autoclave bag
• Biohazard spill warning signs, and flagging tape.

All non-disposable items should be compatible with the disinfectant to be used or able to be autoclaved. The items should also fit in bags for disinfection or in the autoclave bag.

**Figure 1. Biohazard spill kit**

### 7.2 Medical Emergencies

**Splash to face or eyes**
- Advise lab occupants
- Rinse for 15 minutes with water at the emergency eye-wash station
- Remove contaminated clothing or lab coats for autoclaving (fold them inwards)
- Proceed with emergency treatment below

**Needle sticks or cuts**
- Advise lab occupants
- Wash with soap and water
- Apply a bandage if necessary
- Proceed with emergency treatment below

**Emergency Treatment**
- For immediate emergency medical attention, call Campus Security at 778-782-4500
- If possible, retain the material you were exposed to for testing purposes
- For non-emergencies, you may either call Campus Security, or proceed to SFU Health Services in the Maggie Benston Building (open Mon-Fri 9:00-4:30). Bring information on what materials you were using.
- If sent to the hospital:
  - Indicate to the Admitting Clerk the possibility of a biohazard infection
  - Provide personal history to the health nurse
  - Blood may be examined and a physician may recommend treatment
  - Further blood work and counseling may be required throughout the year
• Have your supervisor complete a WorkSafeBC Form 7 and an SFU incident report form.

7.3 Incident Reporting

When an incident occurs:

1. Secure first aid or medical aid for injuries by phoning SFU Campus security for an immediate response and to help mitigate immediate hazards.

2. Report the incident. All incidents must be reported to your supervisor and to EHRS. Go to http://www.sfu.ca/incidentreporting and follow the steps for incident reporting.

Examples of incidents include, but are not limited to:
• Situations causing personal injury
• Occupational illness
• Fire, major flooding, or explosion
• Chemical, biological or radioactive spills/escapes/discharges
• Collapse or structural failure
• Motor vehicle collisions/damages
• Near-miss incidents (any of the above)

Please note that Supervisors must fill out a WCB (WorkSafeBC) Form 7 when an injured SFU employee received medical aid or when the injury results in time loss from work. The form is available on the EHRS website and should be sent to EHRS for processing.

Incidents will be investigated by EHRS and Safety committee representatives.

Laboratory acquired infections must be reported to PHAC, so if you suspect you have one, contact the BSO immediately.

**EHRS must make an immediate report of "Serious Incidents" to WorkSafeBC.**

"Serious Incidents" include:

• Death, or serious injury (fracture of a major bone, amputation loss of sight, internal hemorrhage, third-degree burns, unconsciousness resulting from concussion, electrical contact, asphyxiation, poisoning, cuts requiring hospitalization or time off work, any injury resulting in paralysis, any other injury likely to endanger life or cause permanent disability)
• Collapse or structural failure of a building, tower, crane, hoist, temporary construction support system or excavation
• An uncontrolled spill or escape of a toxic, corrosive or explosive substance
• Explosion, fire or significant flooding
7.4 Protocol for Biohazard Events

A protocol has been developed for responding to a suspicious or noxious powder or liquid (biohazard material) at the Burnaby and Harbour Centre campuses. The Protocol for Biohazard Event Notification is provided in Appendix F.

8.0 Simon Fraser University Biosecurity Plan

8.1 Purpose

The Canadian Biosafety Standard (CBS) published by the Public Health Agency of Canada (PHAC) requires all institutions and facilities that handle infectious materials to develop and implement a Biosecurity Plan that complements the Biosafety Program. Biosafety describes the containment principles, technologies and practices that are implemented to prevent unintentional exposure to infectious material or toxins, or their accidental release. Biosecurity refers to the security measures designed to prevent the loss, theft, misuse, diversion or intentional release of infectious material or toxins.

The Simon Fraser University (SFU) Biosecurity Plan specifies security requirements for all research and teaching laboratories that handle or store biohazardous or infectious materials, and is based on a biosecurity risk assessment.

Components of the Biosecurity Plan include:
- physical security;
- personnel suitability and reliability;
- accountability for pathogens, toxins and other regulated infectious material;
- inventory;
- incident and emergency response; and
- information management.

8.2 SFU Biosafety Representative

At SFU, the Biosafety Officer (BSO) is the designated biosafety representative who is responsible for ensuring that key elements of the Biosafety Program and Biosecurity Plan are implemented to promote the safety and security of the pathogens, toxins, and other regulated infectious material. To effectively accomplish these responsibilities, the BSO requires knowledge and experience appropriate for the facilities and containment levels, and the pathogens and toxins found at SFU.

All personnel working with infectious or biohazardous materials are required to follow the protocols and procedures outlined in the Biosecurity Plan.
The BSO must be contacted as soon as possible in the event of any loss, theft, misuse, diversion or release of biohazardous materials. The BSO is responsible for reporting these instances to PHAC and other regulatory entities on behalf of SFU.

8.3 Identification and Assessment of Biosecurity Risks

All SFU Principal Investigators (PIs) must apply for an institutional biosafety permit prior to commencing work with infectious or biohazardous materials or toxins. All permit applications are reviewed by the Biosafety Committee Chair on behalf of the Biosafety Committee and the Biosafety Officer to determine whether the proposed handling or storage of infectious or biohazardous materials conforms to the minimum standards outlined in the SFU Biosafety Policy R20.02, which can be found at http://www.sfu.ca/policies/gazette/research/r20-02.html, the CBS, and the Human Pathogens and Toxins Regulation (HPTR). Permit applications are assigned a minimum required containment level, and their potential biosecurity risk is assessed. Factors in the biosecurity risk assessment include the consequence of releasing the infectious material into the community and environment, specific threats related to those materials or the locations where they will be used, and mitigation strategies to address any identified biosecurity risks that are required to be in place prior to the work commencing. All identified Biosecurity risks and mitigation strategies are clearly outlined in the Biosafety Permit.

The Biosafety Committee has the authority to restrict or prohibit the use or storage of infectious or biohazardous materials based on the outcome of a Biosecurity risk assessment.

8.4 Physical Security

There are various strategies in place at SFU to ensure the physical security of infectious or biohazardous materials being handled or stored in laboratories. These strategies will vary, and are based on the containment level assigned a particular laboratory in a particular building or facility.

Containment Level 1

- Doors must kept closed at all times.
- Access to containment zone to be limited to authorized personnel and authorized visitors.

Containment Level 2

- Doors must kept closed at all times.
- Doors must be lockable.
- Doors must be locked when laboratory is unoccupied.
- Fridges or freezers storing infectious or biohazardous material and located in a shared room must be either locked, or the door to the shared room must be kept locked.

Containment Level 3
- Interlock door system accessible only by electronic key card, and fitted with an audible alarm.
- Access granted only with the approval of both the CL3 Laboratory Operations Manager and Biosafety Officer.

Campus Security conducts regular patrols of laboratory buildings, and in consultation with the BSO, investigates any suspicious behavior regarding the physical security of containment laboratories. It is the responsibility of all laboratory personnel to report suspicious activities or unauthorized visitors to the BSO.

### 8.5 Personnel Suitability & Reliability

Access to all research and teaching laboratories at SFU is limited to authorized laboratory personnel (including all faculty, staff, and students under the direct supervision of the Principal Investigator or Laboratory Instructor responsible for the laboratory), facilities staff, janitorial staff, and authorized and escorted visitors (including 3rd party contractors and equipment vendors). Biosafety and Biosecurity training relevant to the containment level, and the tasks being performed is mandatory for all personnel with access to laboratories that handle or store infectious or biohazardous materials.

Biohazardous materials awareness training is required for all facilities and janitorial staff that may be required to enter a laboratory during the course of their work.

Visitors must be authorized by laboratory personnel familiar with the activities and biohazardous materials associated with the laboratory. Visitors must be escorted in the laboratory.

Human Pathogens and Toxins Act Security Clearances may be required for personnel accessing the CL3 containment facility and/or handing or storing security sensitive biological agents (SSBAs).

### 8.6 Accountability for Pathogen, Toxin, and Other Regulated Material Inventory

A requirement for any Biosafety Permit application is the inclusion of a detailed infectious and biohazardous materials inventory. This electronic record is a part of the online Biosafety Permit Application System, and includes information on the name of the infectious material, the source where it was obtained from, the maximum quantity of infectious material used at any one time, storage location, and a unique storage vessel identification. The electronic inventory must be updated on a regular basis when new infectious or biohazardous materials are obtained, or when a laboratory is no longer working with that material. Inventories must be reviewed by the PI or Laboratory Instructor when changes to the inventory occur or at a minimum, during the annual permit review.

PI/lab supervisors must keep additional records including but not limited to:

- transfer or import records of infectious materials brought in from outside SFU
- records of internal transfers of infectious materials within SFU
- records of authorized laboratory personnel
All infectious or biohazardous materials must be clearly labelled. A record must be maintained for the inactivation and disposal of all infectious materials after use.

The loss, theft, misuse, diversion or intentional release of all regulated biohazardous materials must be reported to the supervisor and BSO immediately.

8.7 Incident and Emergency Response

All biosecurity incidents involving infectious or biohazardous materials must be reported immediately to the laboratory supervisor, Campus Security and BSO. All incidents will be reported, documented, and investigated. Incidents may include, but are not limited to missing infectious materials, unauthorized entry to a restricted area, or unauthorized removal of pathogens from the containment zone.

All biosafety incidents must be reported to the laboratory supervisor and BSO. All laboratory personnel must be trained on the detailed information related to emergency spill response, earthquakes and fires found within the SFU Biosafety Manual and SFU Laboratory Safety Manual.

The BSO is responsible for reported incidents to PHAC when required or appropriate.

8.8 Information Management

The Biosafety Permit Application system that includes the specific laboratory inventories and associated storage locations is accessible only to SFU personnel, and only to specific personnel approved by the PI or Laboratory Instructor. SFU personnel cannot view or manipulate the electronic records of another laboratory. The Biosafety Permit Application System and corresponding inventory system must adhere to all applicable SFU information technology and information security policies that cover who has access to data, and where electronic data and associated servers are stored. A comprehensive list of relevant SFU information policies can be found at https://www.sfu.ca/policies/gazette.html.
Appendix A: SFU Biosafety Policy R20.02 and Associated Procedures
1. Purpose

To ensure the safety of students, faculty, staff, the community and the environment when using biohazardous materials under the auspices of Simon Fraser University, and to facilitate research, teaching and testing in compliance with the applicable regulations and standards outlined below.

2. Definitions

Biological Materials

a. "Biohazardous Materials" are defined as biological agents and materials that are potentially hazardous to humans, animals and other forms of life. They include known pathogens and infectious agents including bacteria and their plasmids and phages, viruses, fungi, mycoplasmas, and parasites; cell lines, animal remains, and laboratory animals (including insects) which might harbor such infectious agents, primate body fluids and plant materials. Also included are nucleic acids used in procedures such as recombinant DNA and genetic manipulations;

b. "Human materials" are defined as human blood, blood products, blood components, body fluids, tissues or organs;

c. "Animal materials" are defined as animal blood, blood products, blood components, body fluids, tissue or organs;

d. "Plant materials" are defined as plant pathogens, transgenic plants, plant toxins and exotic plants;

e. "Recombinant DNA" are defined as molecules constructed by joining natural or synthetic DNA or RNA segments to DNA or RNA molecules, able to replicate in a living cell.

Biosafety Containment Levels

Biosafety containment levels are described in general terms. Health Canada Laboratory Biosafety Guidelines apply except in cases where the research is funded by institutions which require containment practices that conform to those specified by the US CDC.

f. "CL1" applies to a basic microbiology laboratory, where work may be done on an open bench top;
g. "CL2" applies to a laboratory that handles agents requiring containment level 2. The primary exposure routes associated with organisms requiring level 2 containment are ingestion, inoculation, and mucous membranes. Although these agents are less commonly transmitted by airborne routes, the generation of aerosols must be avoided through use of biosafety cabinets, sealed rotor centrifuges as well as appropriate personal protective equipment;

h. "CL3" applies to a laboratory that handles agents requiring containment level 3. These agents may be transmitted by the airborne route, often have a low infectious dose to produce effects and can cause life threatening disease. Containment level 3 emphasizes additional primary and secondary barriers to minimize the release of infectious organisms into the immediate laboratory and the environment, such as HEPA filtration of exhausted laboratory air and controlled laboratory access.

**Regulators**

i. "HPTA" Human Pathogens and Toxins Act, and all accompanying regulations;

j. "PHAC" Public Health Agency of Canada;

k. "CFIA" Canadian Food Inspection Agency;

l. "NIH" National Institutes of Health;

m. "TDG" Transportation of Dangerous Goods;

n. "WorkSafeBC" WorkSafeBC, Occupational Health and Safety Regulation;

o. Metro Vancouver.

**Administrative Requirement**

p. "Biosafety Permit" is defined as the document certifying approval by the Biosafety Committee for use of biohazardous materials under specified conditions. Biosafety Permits are granted to SFU faculty or adjunct faculty members proposing to carry out research or teaching involving biohazardous material.

**Personnel**

q. "Principal Investigator (PI)" is defined as the SFU faculty member (or acceptable equivalent as defined in other SFU policies) in charge of a research or teaching project;

r. "Biosafety Officer" shall be appointed by the Vice President, Research, shall be qualified to assume responsibility for the SFU Biosafety Program, and give technical advice on projects and laboratory facilities involving biohazards;
s. "Certified User" is defined as the individual whose name appears on the approved Biosafety Permit;

t. "Laboratory Workers" are defined as all employees, students and visitors conducting research or educational activities under the auspices of SFU in SFU laboratories involving "biohazardous materials" as defined above.

3. Scope

This policy applies to all research, teaching and testing involving biohazardous material that is undertaken under the auspices of SFU and/or using the resources of SFU. All projects must have an SFU faculty member (or equivalent as defined in 2q above) as PI. Where the SFU Biosafety Committee grants "in principle" approval for research involving biohazards at another institution, a copy of that institution’s permit, for the research, must be filed at SFU.

4. Standards

The University adopts standards compliant with:

   a. the Memorandum of Understanding between the three Canadian federal granting agencies and Institutions that receive their awards;

   b. the policies and procedures of SFU and the SFU Biosafety Committee;

   c. all relevant federal and provincial regulations (Human Pathogens and Toxins Act, Public Health Agency of Canada, Canadian Food Inspection Agency);

   d. the National Institutes of Health;

   e. WorkSafeBC; and

   f. Transportation of Dangerous Goods

5. Policy

   a. Authority

      The SFU Biosafety Committee has the authority, on behalf of the Vice-President, Research, to:

         i. stop immediately any use of biohazardous material which deviates from the approval outlined in the Biosafety Permit or is deemed to be in non-compliance with the applicable standards as in part 4.

   b. Responsibility
i. The day-to-day requirement to comply with safe use of biohazardous materials in research and teaching under the auspices of SFU is the responsibility of the PI.

ii. All lab workers using biohazardous materials in research or teaching must have the necessary expertise and appropriate training in accordance with the policies of SFU and Standards outlined in part 4. The Biosafety Officer in consultation with the SFU Biosafety Committee will decide upon the appropriate methods of achieving the appropriate expertise and training levels.

iii. The acquisition of all biohazardous materials (by purchase, culture or transfer from another source) must be arranged in accordance with protocols approved by the SFU Biosafety Committee.

iv. The disposal of all biohazardous materials must be in accordance with protocols approved by the SFU Biosafety Committee and in compliance with all relevant federal, provincial and Metro Vancouver regulations and guidelines.

v. The Biosafety Officer, in close collaboration with and support of the SFU Biosafety Committee, is responsible for monitoring the compliance of researchers and instructors with SFU policy and the terms of the approval of their projects. If the Biosafety Officer observes or becomes aware that relevant regulations or guidelines are not being followed in any teaching program or research study, she/he advises the Principal Investigator so that prompt remedial action can be taken. In the event that this is not done to her/his satisfaction, the Biosafety Officer will alert and consult with the SFU Biosafety Committee. In circumstances where the Biosafety Officer is of the opinion that the situation presents an immediate significant risk, the Biosafety Officer may take whatever action she/he considers necessary to remedy the situation. The Biosafety Officer keeps the SFU Biosafety Committee Chair and the Vice President, Research fully informed of such incidents and the reason for the action taken. She/he may also, at her/his discretion, seek the advice of PHAC, CFIA, or other experts as may be appropriate.

vi. The Biosafety Officer maintains up-to-date records of all Biosafety Permits, approved locations, certified users, containment equipment, equipment certifications and personnel training. The Biosafety Officer reports, at least yearly to the Chair of the SFU Biosafety Committee with a summary of such records, and granting agencies as required.

vii. The SFU Biosafety Committee ensures that researchers use appropriate containment facilities for the proposed research involving biohazardous materials.

viii. All proposals involving the use of biohazardous materials in research and teaching require the prior approval of the SFU Biosafety Committee. The detailed responsibilities and powers of the SFU Biosafety Committee are
those set out in its Terms of Reference and its Procedures. These are published and may be modified from time to time under the authority of the Vice-President, Research. The current procedures for consideration of Biosafety Permit application for the use of biohazardous materials are attached to this policy.

ix. The Biosafety Officer shall undertake continuing education and training opportunities in biocontainment and security of biohazardous materials.

c. SFU Biosafety Committee membership

The SFU Biosafety Committee members will be appointed by the Vice-President, Research for renewable terms of three to four years. The committee membership should include:

i. five faculty members drawn from key units where faculty members hold biosafety permits. Expertise of the faculty members must encompass microbiology, plant or animal pathogens, recombinant DNA, and containment principles;

ii. the Director of the Animal Resource Centre (or designate);

iii. one member representing laboratory technical staff;

iv. two members representing community interests and concerns, with appropriate expertise in biosafety, and who have no affiliation with the University;

v. the Biosafety Officer;

vi. a graduate student representative;

vii. the Director of Environmental Health and Safety as non-voting resource member;

viii. the Operations Director of the Containment Level 3 Laboratory as a non-voting resource member;

ix. the SFU Biosafety committee must have a Vice Chair who can become designated Chair as required; and

x. a quorum of two thirds of the members should be established for the SFU Biosafety Committee meetings.

a. Standard Operating Procedures (SOPs)

SOPs and other guidelines for compliance inspections, acquisition, use, storage, and disposal of biohazardous materials are developed and published by the Biosafety Officer after having been approved by the SFU Biosafety Committee.
6. Interpretation

Questions of interpretation or application of this policy or its procedures shall be referred to the VP Research, whose decision shall be final.

PROCEDURES

Consideration of Application to Use Biohazardous Materials

The Principal Investigator (PI) submits a completed form entitled “Application for a Biosafety Permit for Research or Teaching” to the Biosafety Officer at least eight weeks before the planned commencement of the project. In certain cases, such as teaching protocols, the Biosafety Officer may agree to a different time scale. In all cases sufficient time must be allowed for the review of the procedures to be employed in the project. It is recommended that the application be reviewed by the Biosafety Officer prior to submission to the SFU Biosafety Committee. The application form is available from the Biosafety Officer or from the EHS, and SFU Research Services web site. The PI must review their research permit applications annually and renew their permits every four years. In the case of teaching protocols, the permits must be renewed every semester. Any changes to the application must be submitted as an amendment and approved before implementation. Major changes may warrant submission of a new application.

a. As part of the application, the PIs assign the risk group for each organism they propose to work with. Information on risk groups can be obtained by contacting the Biosafety Officer or Safety Advisors in Environmental Health and Safety.

b. Upon receipt by the Biosafety Officer, she/he reviews the application for consistency with the SFU Biosafety Committee Terms of Reference, assigns a permit number and considers the following:

   i. the determination of whether the proposed handling of biohazardous materials conforms to the standards specified in this Policy; and

   ii. the availability of required containment facilities and containment equipment.

c. For CL 1 and 2 projects:

   i. After review by the Biosafety Officer, the application is forwarded to the Chair of the SFU Biosafety Committee for review and decision. If a decision cannot be made, the permit application is forwarded to the SFU Biosafety Committee for the final decision.

   ii. The SFU Biosafety Committee is informed of all decisions made by the Chair at the next SFU Biosafety Committee meeting.

d. For CL 3 projects and for projects described under section c(i) above that were not approved by the Chair:
i. After a review is made by the Biosafety Officer, the application is sent to all SFU Biosafety Committee members for review. A decision by majority vote is made by the SFU Biosafety Committee at their next committee meeting. The Chair does not normally vote except to create or break a tie.

ii. For all CL 3 projects, or any protocols of concern to the SFU Biosafety Committee, a presentation by the PI is required at the SFU Biosafety Committee meeting at which the application is considered.

e. For Biosafety Permit renewals:

i. The application is forwarded to the Biosafety Officer and if necessary to the Biosafety Committee Chair.

ii. The SFU Biosafety Committee is informed of all renewals made by the Biosafety Officer or Chair at the next SFU Biosafety Committee meeting.

f. The Chair of the SFU Biosafety Committee informs the PI of the SFU Biosafety Committee decision in writing.

g. The Chair of the SFU Biosafety Committee signs all approved permits and lists any outstanding items that must be addressed by the applicant before the permit is considered to be valid.

h. Once the outstanding items have been addressed to the satisfaction of the SFU Biosafety Committee and Biosafety Officer, the Biosafety Officer signs the permit.

i. If the project is approved, the Biosafety Permit information will be made available to the Office of Research Services. The Environmental Health and Safety Department retains signed copies of all approved applications and permits.

j. If the project is not approved, the PI is asked for more information, and may be required to submit a revised project proposal for review by members of the SFU Biosafety Committee.

k. If these actions fail to lead to approval of the project, the Chair of the SFU Biosafety Committee provides the PI with a written statement of reason for non-approval of the project.

l. The PI may ask for a hearing before the SFU Biosafety Committee to appeal the decision. In the event the appeal is not successful, the PI may appeal to the Vice President, Research who may appoint an appeal committee. The decision of that committee, if ratified by the Vice President, Research, would be final. The Public Health Agency of Canada may be called upon for information purposes; however, appeals cannot be directed to the Public Health Agency of Canada.

Biosafety Committee Terms of Reference

The Simon Fraser University Biosafety Committee is authorized to oversee the University’s Biosafety Program, provide policy direction and recommend changes to the
Vice President, Research for all teaching, research and testing activities involving the use of biohazardous materials. The Committee reviews biosafety permit applications for teaching, research and testing, issues permits, and monitors activities involving the use of biohazardous materials to confirm compliance with the standards outlined in the Biosafety Policy R20.02. These standards include Public Health Agency of Canada (PHAC), Canadian Food Inspection Agency (CFIA) National Institutes of Health (NIH), Occupational Health and Safety Regulation of BC (WCB), SFU Policies and SFU Biosafety Committee (SFUBC) Procedures.

Mandate

Administrative:

- Issues and renews Biosafety Permits for the use of all biohazardous materials and specifies appropriate procedural and physical laboratory containment requirements, and as required, implementation of health surveillance program;
- Reviews and, as required, amends containment level one, two and three permits issued by the Biosafety Committee Chair;
- Reviews and, as required, amends permit renewals issued by the Biosafety Officer;
- Advises the Vice President, Research of any perceived need for additional resources to establish, maintain, or improve the Biosafety Program.

Compliance & Conformance:

- Suspends Biosafety Permits in cases of non-compliance or in cases of emergencies involving loss or potential loss of containment;
- Monitors certification and re-certification of containment level 3 laboratories;
- Monitors movement of biohazardous materials within the University and for compliance with Transportation of Dangerous Goods Regulations when shipping or receiving biohazardous materials;
- Reviews summary results of external and internal inspections and recommends appropriate action;
- Reviews reports of incidents involving biohazardous materials and ensures appropriate action is taken to prevent reoccurrence.

Lab Containment & Security:

- Investigates and ensures remediation of containment failure;
- Ensures appropriate access control of containment level 2 and 3 laboratories and secure storage of potentially biohazardous materials.

Advisement:

- Advises on policies and protocols relating to the Biosafety Program to promote safe and environmentally appropriate practices, in support of compliance with regulatory and University requirements;
- On a three-year cycle, undertakes a formal review of the Biosafety Policy;
• Reviews research and teaching proposals involving the procurement, use, storage, transfer, and disposal of biohazardous materials to assess risk, containment requirements, proposed procedures, training and expertise of personnel;
• In consultation with the University Biosafety Officer, reviews, recommends and acts as an expert resource for biosafety education and training programs for University employees and researchers, and monitors training activity.

Reporting:
• Reports to the appropriate regulatory body substantial problems or violations of guidelines, and significant accidents or illnesses;
• Provides an annual report of its activities in the previous year and compliance status to the Vice President, Research each April.

Membership
All members are appointed by the Vice President, Research for a three-year renewable term. When deemed necessary for specific expertise, *ad hoc* consultants will be brought in.

The committee membership shall be as outlined in the Biosafety Policy R20.02:
• Five faculty drawn from key units where faculty members hold biosafety permits. Expertise of the committee must encompass microbiology, plant or animal pathogens, recombinant DNA, and containment principles;
• The Director of the Animal Resource Centre;
• One member representing laboratory technical staff;
• Two members representing community interests and concerns with appropriate expertise in biosafety, and who have no affiliation with the University;
• Biosafety Officer; and
• Graduate Student Representative.

Non-Voting resource members:
• Director of Environmental Health and Safety (EHS).
• Operations Director of the Containment Level 3 Laboratory

Chair
The chair shall be nominated and elected by the members for a three-year term.

The chair will also be responsible for encouraging all committee members to attend an orientation session, organized by the Biosafety Officer, on the duties of the committee and protocol of biosafety review.

Quorum
For voting purposes, two thirds of voting members must be present.
Voting Privileges

The Chair does not normally vote, except to create or break a tie. All other duly appointed members have voting privileges. Resource persons, as listed, are non-voting members of the committee.

Secretariat

EHS shall provide an individual to act as secretary. The secretary shall be responsible for:

- Recording minutes of the meetings and related correspondence;
- Issuing notices of meetings after consultation with the chair;
- Circulating meeting minutes to the members and Vice President Research; and
- Maintaining all biosafety committee documentation.

Meetings

The committee shall meet at least semesterly. To deal with any critical issues, the chair may call special meetings.

BIOSAFETY PROGRAM INSPECTION PROTOCOL

Regulations

Regulations pertaining to biohazard safety include 1) those from Canadian Federal Agencies, 2) those from agencies that provide funding, 3) WorkSafeBC, 4) transport regulations including vehicle, marine, and aircraft, 5) University requirements, and 6) codes of best practice.

PI (Principal Investigator) Inspection Responsibilities

- Completes the biosafety checklist each semester and posts a copy. Although the PI may delegate responsibilities, the PI remains accountable for all activities occurring in his/her laboratory and common rooms.
- Reports significant problems, illnesses suspected of originating from biohazard work, incidents, or instances of non-compliance/non-conformance.
- PI must make their laboratory available for an inspection at least once a year.
- PI may delegate inspection responsibilities to other lab personnel.
- The Biosafety Officer is available for consultation and guidance.

Simon Fraser University Biosafety Committee Responsibilities

- The Simon Fraser University Biosafety Committee (hereafter referred to as the committee) will investigate and report on incidents relating to biosafety brought to its attention whenever it is believed or suspected that any breach of compliance or conformance or other safety hazard may have occurred or is occurring. Committee members and Environmental Health and Safety employees who are
trained in biosafety to the satisfaction of the committee may enter any containment level 1 or 2 laboratory or its related premises under the jurisdiction of SFU, at any time, to examine items related to biosafety operational procedures or physical containment. Inspection of containment level 3 facilities will be pre-arranged with laboratory personnel.

- The committee may decide to not grant a biosafety permit where previous indications of noncompliance/non-conformance either at SFU or other institutions indicates an unacceptable risk.
- The committee is responsible for conducting and/or delegating inspections.
- Inspections will be regularly conducted and of such frequency so as to provide an assurance to the University that all labs are reasonably believed to be in compliance and conformance at least once every year.
- Instances of a PI who does not make their laboratory available for an inspection at least once a year will be treated as non-compliance with the SFU inspection protocol.

EHS Responsibilities

- Promote and monitor compliance with policies, regulations and procedures for safe use, handling, monitoring, storage, transport, and disposal of biohazardous materials.
- Advise the Vice-President, Research and the committee on matters related to non-compliance / nonconformance.
- Be available for consultation on problems.
- Ensure proper maintenance of records.
- Investigate reports of biosafety non-compliance / non-conformance in consultation with the committee.

1st Formal Inspection

- Inspections will identify items requiring attention and a written list of these items will be made available to the PI.
- Items that were rectified during the inspection will be noted.
- Items that cannot be rectified immediately will necessitate a 2nd inspection.

2nd Formal Inspection

Will be conducted to determine whether the items requiring rectification were addressed in a timely fashion. A summary of the inspection results will be made available to the PI and to the committee. The committee, upon reviewing the 2nd inspection results, may:
- file a report in EHS and notify the PI that the laboratory or area is in compliance / conformance; or
- issue a notice to the PI requesting a written response to indicate either 1) how compliance / conformance will be attained and/or 2) why the PI believes the laboratory and personnel are in full compliance / conformance.

Review of Written Response
If the committee has requested a written response, the committee will review that response and:

- if the committee concurs that the laboratory or area is in compliance / conformance, the committee will so notify the PI and Environmental Health and Safety;
- if the committee believes that the written proposed actions will suitably address the non-compliance/ non-conformance, the committee will so notify the PI, and schedule a 3rd inspection for verification; or
- if the committee believes that the laboratory or its personnel will remain in a state of noncompliance/ non-conformance, the committee will engage in communication with the PI until such time as the committee deems that a 3rd inspection or alternate action (such as permit suspension) is appropriate. If the permit is suspended, the committee will notify the Vice President, Research and the granting agencies.

3rd Formal Inspection

Will be conducted under the conditions noted above. A summary of results will be made available to the PI and to the committee. The committee upon reviewing the 3rd inspection results may:

- file a report in EHS and notify the PI that the laboratory or area is in compliance / conformance; or
- if the committee believes that the laboratory or its personnel remain in a state of non-compliance / non-conformance, notify the PI and engage in communication with the PI until such time as the committee deems that alternate action is appropriate.

Consultation Outcome

- file a report in EHS and notify the PI that the laboratory or area is in compliance / conformance; or
- notify the Vice President, Research, the PI and granting agencies that the permit is suspended.

SFU Permit Suspension

If the committee has deemed it necessary to suspend an SFU biosafety permit, the committee will request records of non-compliance / non-conformance be held on a PI’s record for four years.

Immediate Dangers

If an immediate danger to people or the environment is observed, the committee may immediately suspend the SFU biosafety permit for that work and require the cessation of that work. The committee will notify the Vice President, Research and Environmental Health and Safety of the suspension.

Interpretation
Questions of interpretation or application of inspection procedures shall be referred to the committee.

Appeals

Decisions of the committee may be appealed to the Vice President, Research.
Appendix B: Laboratory Safety Orientation Checklist
Laboratory Safety Orientation Checklist

Employee/Student’s Name (print)  ____________________________________
Department  ____________________________________________
Supervisor  ____________________________________________
Date (dd/mm/yy)  ____________________________________________

It is a WorkSafeBC requirement that all new employees must be given a health and safety orientation and training specific to their workplace before they begin work. Environmental Health & Research Safety (EHRS) offers general lab safety training sessions at the beginning of each semester. The Supervisor is responsible for identifying the training sessions that are applicable to their new employee/student. Attendance at these applicable training sessions is mandatory.

<table>
<thead>
<tr>
<th>Training Course</th>
<th>Required (Y/N)</th>
<th>Date Trained (dd/mm/yy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Safety training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Safety training</td>
<td></td>
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<tr>
<td>Biosafety training</td>
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<tr>
<td>Fire Safety training</td>
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<tr>
<td>Spill Response training</td>
<td></td>
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</tr>
</tbody>
</table>

SECTION A – GENERAL SAFETY TRAINING

The following checklist includes a list of topics that are covered during the Lab Safety Training sessions offered by EHRS. If the applicable courses indicated above have been completed, please proceed to section B – Lab Specific Training. If a new employee/student is not able to attend the Lab Safety Training sessions prior to commencing work in a lab, the Supervisor or designate is responsible for covering the topics listed in this section.
INTRODUCTION
I was informed of SFU’s Health and Safety Policies, including
- GP 17 OH&S policy
- GP 39 Working Alone or in Isolation policy
- GP 31 SFU Emergency policy
- GP 22 Fire Procedure

SAFETY RESOURCES
I was informed of the various health & safety resources available to me, including:
- My Supervisor
- Local safety committee and Central University safety committee
- Environmental Health & Research Safety Department
- Radiation Safety Department
- Campus Security

EMERGENCY PROCEDURES
- SFU emergency phone number – ext. 24500 or 778-782-4500
- Campus Security is the first aid provider on campus
- Location of first aid station for minor injuries – lower level of Maggie Benston
- Location of the lab’s first aid kit

BASIC LABORATORY SAFETY
- I have read SFU’s Laboratory Safety Training Manual.
- I was instructed not to eat, drink, or apply makeup in the lab.
- I was instructed not to wear lab coats and gloves outside the designated lab area.
- I was informed as to the location and purpose of Material Safety Data Sheets.
- I was informed of the importance of good personal hygiene and understand the proper hand washing protocol.
- I was informed of the purpose of the Door Signage program at SFU and am familiar with the different door signs in use (e.g., chemical, biohazard, radioisotope). See http://www.sfu.ca/srs/ehs/research-safety/general-lab-safety/signage.html
I am familiar with the requirement to report all incidents, accidents and near misses to my Supervisor and to EHRS [http://www.sfu.ca/srs/report-incident-online.html].

**CHEMICAL LAB SAFETY**
- [ ] I received instruction on the safe handling and storage of chemicals.
- [ ] I received instruction on the safe disposal procedures for chemicals.
- [ ] I received instruction on the appropriate measures to take in case of a chemical spill or exposure. See [http://www.sfu.ca/srs/ehs/research-safety/general-lab-safety/spill-response.html](http://www.sfu.ca/srs/ehs/research-safety/general-lab-safety/spill-response.html)
- [ ] I received instruction on safe fume hood operation.

**BIOSAFETY**
- [ ] I have read SFU’s [Biosafety Policy (R20.02)](http://www.sfu.ca/srs/ehs/biosafety).
- [ ] I have reviewed the [Canadian Biosafety Standards and Guidelines 1st Edition](http://www.sfu.ca/srs/ehs/biosafety) (published by PHAC and CFIA) for work with human and animal pathogens.
- [ ] I received instruction on the safe handling and storage of biohazardous materials.
- [ ] I received instruction on the appropriate measures to take in case of a biohazard spill, exposure or incident.
- [ ] I received instruction on the safe operation of a biosafety cabinet.
- [ ] I was advised of the requirements regarding the movement and transfer of infectious materials, including the [Transportation of Dangerous Goods](http://www.sfu.ca/srs/ehs/biosafety) requirements.

**HAZARDOUS WASTE DISPOSAL**
- [ ] I was informed of and understand the SFU waste disposal procedures for: broken glass, sharps, biohazardous waste, and chemicals.
- [ ] I was informed of the hazardous waste system at [https://hazmatwaste.its.sfu.ca](https://hazmatwaste.its.sfu.ca) which must be completed to arrange for pick-up of hazardous waste from my lab.
SECTION B – LAB-SPECIFIC TRAINING

The following lab-specific training topics must be covered by the new employee’s Supervisor or designate. Please note that this checklist is not exhaustive and it is the Supervisor’s responsibility for training his/her new employee/student on all lab-specific protocols and procedures. For those items not applicable to your work or research activities, please indicate N/A (not applicable).

BASIC LABORATORY SAFETY

☐ I was advised of my Supervisor’s policy for working alone in the lab.
☐ I know the location of the closest fire alarm pull stations.
☐ I know the location of the fire extinguishers.
☐ I know the location of the closest emergency exit and have been instructed as to the evacuation route and assembly area.
☐ I know the location of the eyewash and emergency shower and was instructed how to operate them.
☐ I was instructed on proper lab attire (e.g., long pants and no open-toed shoes).
☐ I was provided with the following personal protective equipment (PPE) and was instructed in its proper maintenance and use (select all that apply).
☐ Disposable gloves
☐ Other ___________________
☐ Lab Coat
☐ Safety Glasses/ Goggles

EMERGENCY PROCEDURES

☐ Location of the first aid kit.
☐ Location of the chemical and biological spill kits.
☐ Location of safety resources in the lab (e.g., specific protocols, safety manual).

BIOSAFETY

☐ I received instruction on the safe handling and storage of the biohazardous materials used in the lab.
☐ I received instruction on the decontamination procedures for the techniques performed in the lab.

☐ Not Applicable
☐ I am familiar with the supervisor’s biosafety permit and any restrictions listed on it.

☐ If human blood is being handled, I have been offered the Hepatitis B vaccination (at the Supervisor’s expense).

LAB EQUIPMENT INSTRUCTION

☐ I received instruction on the safe use of laboratory equipment (e.g., centrifuge, autoclave, fume hood, biosafety cabinet, cell sorter, etc.). Please note that some departments offer equipment training at the beginning of each semester.

*Please list all equipment that will be used by the new employee and indicate whether the employee has been trained on its use.*

________________________________________________________________

________________________________________________________________

________________________________________________________________

ACKNOWLEDGEMENT

I, ___________________________________________ as member of the laboratory of ___________________________________________ (supervisor’s name), fully understand all applicable points in this laboratory safety orientation checklist.

________________________________________________________________

Laboratory Personnel’s Signature Date

________________________________________________________________

Laboratory Supervisor’s Signature Date

*Once completed and signed by both personnel and supervisor, the checklist should be kept by the Lab Supervisor together with a copy of the employee/student’s EHRS training certificate.*
Appendix C: Sample Entry/Exit Protocol
Sample Entry/Exit Protocol

Personal Protective Equipment

- The following PPE must be worn at all times in the lab: lab coat, gloves, and safety glasses. Safety goggles must be worn if there is potential for splashing.
- Open-toed shoes and bare arms/legs are NOT permitted in the lab.

Personnel Entry Restrictions

- Entry to the lab is restricted to trained faculty, staff and students who are conducting research under the biosafety permit assigned to the PI responsible for the lab.
- Maintenance and Janitorial staff may enter the lab if they have received hazard recognition training specific to SFU.

Visitors

- All external (non-SFU) visitors to the lab must sign-in using the “Visitor log book”.
- All visitors must be accompanied at all times by trained lab personnel.

Decontamination Procedures

- Equipment/ materials leaving the lab must be free of contaminants. Wipe surfaces with 70% ethanol, 10% bleach or Virocidin.
- Any biological samples leaving the lab must be in a sealed, leak-proof, and puncture resistant secondary container with enough absorbent material to completely retain all of the contents of the primary container(s). Please label this container with a biohazard symbol when in use.
- All level 1 and level 2 biohazardous waste must be collected in the appropriate disposal bags (clear bag for level 1 waste; orange bag for level 2 waste).
- For **LEVEL 1** biohazardous waste:
  - Place waste in clear autoclave bags; decontaminate the outside of the bags with a suitable disinfectant
  - Close the bags loosely with hatched autoclave tape, affix label (refer to the Labelling Guideline), and place in your lab’s designated bin
  - Submit a request to arrange pickup
- For **LEVEL 2** biohazardous waste:
  - Place waste in orange autoclave bags, close bags loosely with tape marked “autoclave” and autoclave on site.
  - Place in the designated bins in each autoclave room for pick-up by the waste disposal company.

**Immunization and Medical Surveillance**

- If a vaccine is available for a biological agent that is used in the lab, then all workers who may be exposed to that agent must be offered the vaccination, free of charge.
- Persons with severe immunological deficiencies, medical or preexisting conditions, pregnancies or undergoing treatment with immunosuppressive drugs should identify themselves prior to entering the lab.

**In Case of Fire**

- Evacuate the lab immediately and close the door behind you. Only use a fire extinguisher if the fire is contained and you have been trained on fire extinguisher use.
- Contact Campus Security at ext. 2-4500
Appendix D: Biological Safety Cabinet Safe Operating Instructions
Biological Safety Cabinet Operating Instructions

Before using the cabinet:

- Turn off the UV lamp (if in use).
- Verify the correct position of the sash.
- Confirm inward directional airflow by gauge readings or by using a tissue.
- Disinfect work surfaces with appropriate disinfectant.
- Place essential items inside cabinet.
- Allow the blower to run for 5-10 min before starting work.

While using the cabinet:

- Place small biohazard bag in container for discarding tips, etc. as you work.
- Ensure material and equipment is placed near the back of the hood, especially aerosol-generating equipment. Do not block any vents.
- Wear appropriate personal protective equipment.
- Use techniques that reduce splatter and aerosols.
- General work flow should be from clean to contaminated areas.
- Avoid excessive movement of hands and arms through the front of the cabinet.
- Avoid the use of open flames.

After using the cabinet:

- Leave the blower on for at least 5 minutes to purge the cabinet.
- Ensure all containers are closed/covered before removing from the cabinet.
- Remove and decontaminate equipment and materials.
- Disinfect cabinet surfaces.
- Turn off the blower and turn on the UV lamp.

In case of BSC failure:

1. Discontinue work with the biological material immediately.
2. Cap or seal all cultures securely.
3. Decontaminate the work area with an appropriate disinfectant.
4. Contact Facilities Services at ext. 23582.

Certification

Your cabinet must be certified when first installed and then on an annual basis. It must be re-certified anytime it is moved.
Appendix E: Autoclaves: Safe Operating Instructions
Autoclaves: Safe Operating Instructions

General Operation

The effectiveness of decontamination by steam autoclaving is dependent upon the temperature, pressure and exposure time. Particular attention must be given to loading the autoclave, including the size of containers and their distribution in the autoclave. Containers must have good steam permeability and must be arranged in the autoclave in order to permit free circulation of steam. Tight fitting containers do not allow steam penetration. Stacking containers above one another and overloading can prevent steam contact resulting in failure to decontaminate the wastes.

There are two types of autoclave cycles, liquid and dry. It is important to choose the correct cycle.

**Dry cycles:** The temperature and pressure mount rapidly to 121°C / 15psi and hold for the desired time. At the end of this exposure time, the pressure drops rapidly until the autoclave is in a state of vacuum. It remains in a vacuum during the drying stage of the cycle. This can damage fragile containers, cause liquids to boil over or loose particles to be drawn into the plumbing. The dry cycle should therefore only be used for sturdy materials that have no loose or liquid components, such as empty glass, polypropylene and metal.

**Liquid cycles:** The temperature and pressure rise slowly to 121°C / 15psi and are held for the exposure period. The autoclave returns slowly to ambient pressure and unlocks at approximately 100°C. This cycle is the safest for all materials but particularly liquids, garbage (e.g., agar and plastics) and soils. The average cycle will take an hour to complete although it is set for 20 minutes.

Please follow the procedures below for loading, operating and monitoring the autoclaves on campus.

**Loading the Autoclave**

- the autoclave **MUST NOT** be overloaded with too many materials (allow air spaces for steam penetration).
- low-sided autoclave containers/bins must be used and bags placed on their side.
- autoclave bags must not be sealed; they should be loosely taped leaving an opening to allow for steam penetration.
- where possible leave the lids of containers loose to allow steam penetration.
- Foil should be placed over the opening of graduated cylinders, flasks, etc.
- Containers must not be overfilled (2/3 full is the max) or they will boil over.

**Operating the Autoclave**

- the time required for each load is dependent upon the volume and type of material (dense loads require much longer autoclave times).
- select the appropriate cycle for the load (e.g. liquid cycle with a slow exhaust for liquids; dry cycle for solid wastes.)
- DO NOT abort the cycle to speed the process – open only after the completion of the cycle.
- wear thick heat-resistant gloves when opening the autoclave door and be aware of the steam released upon opening – steam escapes at face level.
- before removing your material from the autoclave, check the graph paper or strip chart paper to ensure that the correct temperature and time were achieved.
- in the event of a malfunction follow the appropriate shut down procedures as prescribed by the autoclave manufacturer.
- if there is complete malfunction **DO NOT OPEN**; switch off the power and immediately contact your Supervisor.

**Autoclave Monitoring and Testing**

- use autoclave tape with every load to ensure that the autoclave was turned on (note: this tape is not an indicator of sterility).
- maintain records of each autoclave run, including the time, temperature, and pressure. A log book is provided in each autoclave room for this purpose.
- use biological indicators (e.g., *Bacillus stearothermophilus* spores) at least weekly for autoclaves which are used for decontamination.
- record all results on the Bio-Indicator Test Results form (Appendix C); any unusual results must be reported immediately to the department Administrative Officer and to EHRS.

**Training**

- before using this equipment, all autoclave users must be adequately trained in the safe use and operation of the autoclave including the quality control program.
- training records for autoclave users must be maintained by each department using an autoclave.
Appendix F: SFU Protocol on biohazard event notification
SFU PROTOCOL ON BIOHAZARD EVENT NOTIFICATION

A. Burnaby Campus

NOTIFICATION: An individual (‘notifying individual’) who is concerned about a suspicious or noxious powder or liquid (biohazard material) anywhere on Burnaby campus shall immediately notify Campus Security [telephone: 24500] and their supervisor.

RECEIPT OF NOTIFICATION:

A. STEP ONE

Campus Security shall immediately dispatch security personnel to the area(s) of concern to confirm the initial validity of the complaint.

Campus Security personnel attending the event site(s) shall confirm the initial validity of the complaint (i.e., There is a package or a possible substance.).

If the event is confirmed, Campus Security will immediately evacuate the area and detain evacuees in a safe area for questioning. In addition, Campus Security will pull the ‘fire alarm’ which automatically shuts off the building ventilation systems. Campus Security will then turn off the fire alarm (sound) at the annunciator panel located in the building. (i.e., The act of pulling the fire alarm automatically stops the ventilation system.). In this particular instance, Campus Security will not notify the Burnaby Fire Department until such time as it is determined that a biohazard event exists. Campus Security will keep a fire watch while the alarm system is in ‘trouble mode’.

B. STEP TWO

Campus Security shall notify Facilities Services that a biohazard event potentially exists and that the ventilation system for the building is being shutdown.

Campus Security shall immediately notify the Environmental Health & Safety Department. Campus Security will ensure that notification is received and that the appropriate representative(s) will immediately report to the event area(s).

In addition, Campus Security will then notify the following individuals that Campus Security has received notification of a possible biohazard event and Campus Security has confirmed the initial validity of the complaint:

- Chair, University Biosafety Committee
- Director, Operations (Facilities Services)
- Director, Health, Counseling & Career Services
- Director, Human Resources
- Vice President, Finance & Administration
- Associate Vice President, Administration
- Director, Media & Public Relations
SITE RESPONSE:
At the event site, EHS and Campus Security, working collaboratively, shall gather information and clarify the circumstances of the events by interviewing witnesses (including the ‘notifying individual’).

Working collaboratively, EHS Campus Security and the Chair, University Biosafety Committee shall then assess the information to determine if further investigation is warranted.

If it is determined that a potential biohazard event exists, Campus Security shall notify the RCMP to request a response.

Campus Security shall update/notify the following individuals that a potential biohazard appears to exist:

- Director, Health, Counseling & Career Services
- Director, Human Resources
- Vice President, Finance & Administration
- Associate Vice President, Administration
- Director, Media & Public Relations
- Chair, University Biosafety Committee
- Risk Manager
- President
- Vice President, Academic & Provost
- Vice President, Research
- Vice President, External Relations

Campus Security will also notify contractors and service providers on campus who may have employees working near the biohazard event site.

UPDATING:
Campus Security shall regularly update the above named individuals (and affected contractors and service providers) on the status of the potential biohazard event.

If it is determined that a potential bio-hazard event does not exist, Campus Security shall notify the above individuals and any previously notified contractors and service providers, of the event termination.

Harbour Centre Campus (includes SFU @ HC, Morris J. Wosk Centre for Dialogue, 611 Alexander, Praxis)

NOTIFICATION: An individual (‘notifying individual’) who is concerned about a suspicious or noxious powder or liquid (biohazard material) anywhere on the Harbour Centre campus shall immediately notify Concord Security at Harbour Centre [telephone: 778-782-5252] and their supervisor.

RECEIPT OF NOTIFICATION:
A. STEP ONE
Concord Security @ HC shall immediately dispatch a Security Officer and/or Operations personnel to the area(s) of concern to confirm the initial validity of the complaint.

The Security Officer or Operations Personnel attending the event site(s) shall confirm the initial validity of the complaint (i.e., There is a package or a possible substance.).

If the event is confirmed Concord Security @ HC will immediately evacuate the immediate area and detain evacuees in a safe area for questioning.

B. STEP TWO

Concord Security @ HC shall immediately notify Operations or the Administrator-on-call who shall immediately arrange to have ventilation systems that support the building where the biohazard event potentially exists (if the biohazard event is indoors) shut off.

Operations or the Administrator-on-call shall immediately notify EHS, ensuring that notification is received by same and confirming that the appropriate representative(s) will report to the event area(s).

Concord Security @ HC, Operations and/or the Administrator-on-call will then notify the following individuals that Concord Security @ HC has received notification of a possible biohazard event and Concord Security @ HC and/or Operations has confirmed the initial validity of the complaint.

- Manager, Operations
- Associate Vice President, Harbour Centre
- Director, Health Services @ Harbour Centre
- Landlord’s Representative, where applicable
- Director, Human Resources
- Vice President, Finance & Administration
- Director, Media & Public Relations
- Chair, University Biosafety Committee

SITE RESPONSE:

At the event site, EHS, Concord Security @ HC, Operations and/or the Administrator-on-call, working collaboratively, shall gather information and clarify the circumstances of the events by interviewing witnesses (including the ‘notifying individual’).

Working collaboratively, EHS and the Chair, University Biosafety Committee with Concord Security @ HC, Operations and/or the Administrator-on-call shall then assess the information to determine if further investigation is warranted.

If it is determined that a potential biohazard event exists, Concord Security @ HC, the Administrator-on-call and/or Operations shall notify the Vancouver City Police and Vancouver Fire & Rescue Services to request a response.
Concord Security @ HC, Operations or the Administrator-on-call shall update/notify the following individuals that a potential biohazard appears to exist:

- Associate Vice President, Harbour Centre
- Manager, Operations, Harbour Centre
- Director, Health Services, Harbour Centre
- Landlord’s Representative, where applicable
- Director, Human Resources
- Vice President, Finance & Administration
- Director, Media & Public Relations
- Chair, Biosafety Committee
- Risk Manager
- President
- Vice President, Academic & Provost
- Vice President, Research
- Vice President, External Relations

Concord Security @ HC, Operations and/or the Administrator-on-call will also notify contractors and service providers on campus who may have employees working near the biohazard event site.

**UPDATING:**

Concord Security @ HC, Operations and/or the Administrator-on-call shall regularly update the above named individuals (and affected contractors and service providers) on the status of the potential biohazard event.

If it is determined that a potential bio-hazard event does not exist, Concord Security @ HC, Operations and/or the Administrator-on-call shall notify the above individuals, and any previously notified contractors and service providers, of the event termination.
Appendix G: Bio-Indicator Test Results
## Bio-indicator Test Results

<table>
<thead>
<tr>
<th>Month</th>
<th>Day</th>
<th>Year</th>
<th>Room</th>
<th>Unique I.D.</th>
<th>Test Pack</th>
<th>Autoclave Control (if used)</th>
<th>Incubator control</th>
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Once completed, please send a copy of this page to Environmental Health and Research Safety.