

# LABORATORY BIOSAFETY REGISTRY – INSTRUCTIONAL

## Introduction

This document was developed to provide assistance to University of Alberta (U of A) Principal Investigators (PIs) completing the Laboratory Biosafety Registry – Application form. Information pertaining to Parts A to F of the Application form is provided below. At the end of the document is a short primer on other health and safety services and guidelines available to U of A PIs as they set up their laboratories and prepare for new research. This document should be considered a “living” document as it is expected that sections will be modified or replaced as federal, provincial, and institutional regulations and programs evolve. The most up-to-date versions of the instructional and registry application form will be maintained at the Environmental Health and Safety (EHS) [Biosafety Division webpage](#). Prior to completing a registry application, PIs should check the webpage to ensure that they are using the latest documents.

PIs who will be conducting research at the Cross Cancer Institute (CCI) or the National Institute of Nanotechnology (NINT) should note that these are collaborating agencies with independent biosafety programs. PIs should contact these agencies directly to register their laboratories. To contact the Safety Officer for each organization, click on the corresponding link below.

- [CCI](#)
- [NINT](#)

The Laboratory Biosafety Registry is an inventory of biological and medical research laboratories on campus and their associated biohazards, experimental protocols, safety measures, and research personnel. All PIs who conduct biological or medical research at the U of A must be registered. After a Biosafety Registry record has been generated, it must be updated annually or as changes to personnel, biohazards, or experimental procedures occur. Additionally, PIs must ensure that their Biosafety Registry records are up-to-date when applying for biohazards approval for a research grant. It is important to note that an updated Biosafety Registry *is not equivalent* to biohazards approval for a research project. Biohazards approval is issued in the form of a letter specific for the research funding source and is issued, in part, after a review of the experimental plan detailed in the funding application against the Biosafety Registry on file for the research group involved. For more information on the biohazards approval process, see Part B below and on the application form. **In the absence of a Biosafety Registry, investigators MAY NOT work with biohazardous materials in their laboratories.**

## **Part A: Research Group Personnel**

*Research Group* – The team of investigators that report to a PI. Members may include research associates and technicians, graduate students, postdoctoral fellows, animal care staff, visiting scientists, summer students or other persons under the PI's supervision.

*Principal Investigator (PI)* – A faculty member of the U of A who is eligible for membership in AASUA. A PI must ensure that all personnel conducting research on their behalf understand the associated hazards and have been properly trained in hazard mitigation protocols and the use of appropriate safety equipment.

*Alternate Laboratory Contact* – A member of the research group who agrees to assume responsibility for laboratory biosafety in the event that the PI is unavailable; ideally the individual shall be a collaborator, research associate, research technician, or post-doctoral fellow who routinely conducts work in the relevant laboratory.

*Other Personnel* – All other members of the research group who will be working in the laboratory for any period of time including collaborators, research associates, research technicians, post-doctoral fellows, Masters and Ph.D. students, summer students and volunteers.

*New Research Personnel Form* – To be completed by all new research personnel and returned to the Biosafety Division as a pre-requisite to adding individual to the PI's registry. The form also outlines the need for researchers who work with human body substances to be vaccinated against Hepatitis B and to provide documentation indicating their immunization status or declination of vaccination.

## **Part B. Active Research Grants Transferred to the University of Alberta**

*Letter of Biohazards Approval* – All U of A PIs, students or fellows who have been awarded funding for a biological or medical research grant must apply for biohazards approval from the EHS Biosafety Division. The biohazards review process is designed to ensure that all biological and medical research occurring on campus adheres to established biosafety guidelines. Funding for grants will only be released by the Research Services Office (RSO) upon receipt of a Letter of Biohazards Approval from the Biosafety Division. Letters of Biohazards Approval are specific to the funding source; therefore, each new source of funding for a given project will require its own approval letter.

## **Part C. Location of Research**

*Campus Research Facilities* – Includes the main laboratory space, shared or core facilities, tissue culture rooms, animal housing rooms (inside or outside established U of A Animal Services space), and greenhouses. If an animal housing or greenhouse facility is required but the exact location has not yet been assigned, list "pending" under Building & Room Number.

*Containment Levels* – Describes the minimum engineering, operational, technical, and physical requirements for handling biological materials safely in a laboratory setting. Containment levels may be applied to research, clinical and teaching facilities that are working with microbes or toxins. There are four basic containment levels (see Part D for additional information).

*Shared Room* – In the event that a research group is sharing laboratory space with other research groups, the groups shall consult with and cross-train each other on their biohazardous materials. For example, if one group is working with human clinical specimens, they shall advise the other groups of the presence of this material and the recommendation for hepatitis B vaccination for personnel handling the material.

Together, the groups shall also review the decontamination processes established for the space to ensure that they are effective against all the biohazards in use (i.e., if a group brought cultures of a spore-forming bacteria into a laboratory that was previously being used with enveloped viruses, the 70% ethanol used as a decontaminant with the viruses would no longer be appropriate). Cross-training in shared rooms shall take place before new biohazards are brought into the room.

*Field Research* – All field research conducted by U of A faculty, staff, post-docs, and students; and involving the collection or examination of animals, plants, or environmental samples that could reasonably be expected to harbour infectious microbes shall be disclosed. The infectious microbe could be associated with the species as a whole (i.e., hantavirus in deer mice) or with a particular population (i.e., tuberculosis and brucellosis are concerns when working with bison from Wood Buffalo National Park but not bison from Elk Island National Park). In some cases, particularly research involving foreign travel, exotic diseases may be associated with the locale and shall also be disclosed (i.e., research in tropical locations with a history of malaria).

*Non-University Research Facilities* – U of A faculty, staff, post-docs, and students who will be conducting research with biohazards at the research facilities of a collaborating government, industrial, or academic agency shall provide the contact information of the affiliated biosafety designate prior to commencing work. This will allow the U of A Biosafety Division to coordinate with the collaborating agency to ensure that all biohazard issues are satisfactorily mitigated.

*Off-Campus Clinical Research Trials* – Research trials involving the examination of human patients or the collection of human clinical specimens by U of A faculty, staff, post-docs, and students at an off-campus location or agency shall be disclosed along with the contact information for the biosafety designate overseeing the work. As with non-university research facilities, this will allow the U of A Biosafety Division to ensure that all biohazard issues associated with the work are satisfactorily mitigated.

*Transfer of Materials between Research Locations* – Researchers that plan to transfer specimens, tissue samples, or microbial or toxin preparations between the U of A and a field location or collaborating agency shall describe how materials will be transported safely.

- If transporting microbial or toxin preparations, or environmental or tissue samples that may reasonably be expected to contain pathogenic microbes, consult the federal Transportation of Dangerous Goods (TDG) regulations for packaging guidelines.  
**Note:** packager must be TDG certified; see TDG section under Additional Information.
- If transporting live animals, consult with faculty Animal Care Director or the University Veterinarian for transport guidelines (see Animal Research section below for contact information).
- If transporting non-indigenous, invasive plant species or plants with novel traits, consult the [Canadian Food Inspection Agency \(CFIA\) Plant Control website](#) for packaging guidelines.

#### **Part D. Biohazardous Materials & Practices**

All biological and medical research laboratories at the U of A shall have a copy of the Public Health Agency of Canada (PHAC) [Laboratory Biosafety Guidelines](#) available as a reference and all personnel working in the laboratory shall be familiar with the sections of the guidelines pertinent to their research and facility containment level.

## Microbial Agents & Eukaryotic Cell Lines

*Risk Group* – Used to categorize the relative hazards of infective organisms. Risk group designation is determined by various characteristics of an organism, including:

- Pathogenicity
- Infectious dose
- Mode of transmission
- Host range
- Availability of effective preventive measures
- Availability of effective treatment

As required by Workplace Hazardous Material Information System (WHMIS) legislation, employers shall obtain Material Safety Data Sheets (MSDSs) for all controlled materials used in the workplace, including biohazardous material rated risk group 2 or greater. The risk group of a given pathogenic microbe will be listed in the MSDS. Datasheets for pathogenic microbes and toxins may be obtained from a commercial source or from the PHAC or CFIA websites. If an MSDS for a pathogen, toxin, or eukaryotic cell line is not available from these initial sources, contact the [Biosafety Division](#) for assistance.

*Non-pathogenic (Risk Group 1)* – Microbes and eukaryotic cell lines for which Containment Level (CL) 1 facilities and practices are acceptable. CL-1 operational practices are listed on pages 19 to 22 of the PHAC [Laboratory Biosafety Guidelines](#).

*Risk Group 2* – Microbes and eukaryotic cell lines that require CL-2 facilities and practices. CL-2 practices are listed on pages 22 to 23 of the PHAC [Laboratory Biosafety Guidelines](#).

*Risk Group 3* - Microbes that are highly pathogenic and require specialized containment facilities for their safe manipulation. The U of A has a small CL-3 research laboratory in operation with a limited selection of risk group 3 agents.

*Risk Group 4* - Microbes that are extremely pathogenic. **The U of A does not have appropriate containment facilities for the safe handling of these agents.**

*Infectious animal prion agents* also require special containment facilities designated as enhanced CL-2. The U of A has an enhanced CL-2 laboratory designated for prion research. To arrange access to the prion facility, please contact the [BSO](#). **Note:** non-infectious, non-replicating prion models and yeast prions are exempt from housing in an enhanced CL-2 facility but still require elevated waste management practices. Click [here](#) for a briefing on working with non-infectious, non-replicating prion models at the U of A.

## Large-Scale Culture

Facilities that are used for large-scale culturing of microbes or eukaryotic cell lines require additional safety features. In the event of a spill or breach of the fermentation vessel, such features ensure that cultured agent is not released into the public sewer. For information on containment requirements for large-scale culturing see pages 57 to 61 of the PHAC [Laboratory Biosafety Guidelines](#).

## Recombinant Vector Systems

While the latest generation of recombinant vector systems based on lentivirus, adenovirus, or retrovirus backbones have multiple genetic manipulations that render them replication-deficient, these systems are

still considered risk group 2 agents for the purposes of importation, storage, and genetic manipulation. Therefore, all direct work with these vector systems must be conducted within a CL-2 laboratory following CL-2 practices. Following genetic manipulation, the vector system is considered non-infectious and the host will not shed viable vector. As a result, the host may be housed under its regular containment requirements. For example, transformation of a mouse with a lentivirus vector system must be performed in a CL-2 facility but, following inoculation, the mouse can be housed in a CL-1 animal holding facility.

### **Recombinant Nucleic Acid Manipulations**

PIs shall discuss all planned recombinant nucleic acid manipulations with their research groups and evaluate whether or not a given manipulation may increase the pathogenicity or vigor of the recipient. Manipulations of particular interest are those involving the genes or regulatory sequences for:

- Viral, bacterial, fungal, or parasitic virulence factors,
- Conferring microbial resistance to anti-virals, antibiotics, anti-fungals, or anti-parasitic medications,
- Eukaryotic oncogenes,
- Eukaryotic cytokines, and
- Conferring resistance to plant pesticides.

Report all such planned manipulations to the [Biosafety Division](#) to ensure that appropriate containment practices are in place.

### **Microbial, Plant & Animal Toxins**

Due to associated aerosol hazards, lyophilized preparations of toxins shall be manipulated inside a biological safety cabinet (BSC) or chemical fumehood. In most cases, work with toxins shall be conducted in a CL-2 facility; however, exceptions may be made depending on the potency of the toxin, the host range of the toxin, the availability of effective prophylactic treatment and the availability of aerosol containment in the laboratory. Research groups that wish to work with toxins outside of CL-2 facilities shall consult with the [BSO](#) for an exemption to this standard prior to initiating work with the toxin.

The PI shall also obtain a copy of the material safety data sheet (MSDS) for the toxin to determine if additional emergency response planning is needed. For spill remediation, many toxins require specific enzymatic preparations in buffered solutions for surface decontamination. The PI shall ensure that these preparations are part of their laboratory spill remediation kit before initiating work with the toxin. Similarly, while there is a corresponding anti-toxin or anti-venom for many toxins and venoms, if the source species is not common in the Edmonton area, local hospitals may not have the treatment in stock. Refer to Part E for additional information on the availability of anti-toxins and anti-venoms.

### **Human Tissue Specimens & Body Fluids**

Because there is no comprehensive, real-time test to determine a person's health status, all human body substances (excluding hair follicles and sweat samples but including tissue preparations used for primary cell cultures) shall be collected and handled following Universal Precautions. Universal Precautions establish that all human materials shall be considered infectious and shall be handled in CL-2 facilities following CL-2 operational practices. Even commercial sources of human materials that have been screened against common human blood-borne pathogens shall still be handled using Universal Precautions. The U of A maintains a permitting system for research groups wishing to work with human

materials. To apply to work with human materials, click [here](#). For a briefing on Universal Precautions, click [here](#).

### **Unmonitored Animal Populations**

An unmonitored animal population is one in which the prevalence of infectious disease has not been consistently recorded. This designation includes most wildlife and some agricultural livestock populations but excludes those zoological and laboratory animal colonies with comprehensive health records. Research laboratories that work with tissue specimens or body fluids from unmonitored animal populations shall operate in CL-2 facilities following CL-2 operational practices. If collecting field specimens from unmonitored animal populations, researchers shall wear appropriate personal protective equipment (PPE) (i.e., disposable gloves, possible respiratory protection) and properly disinfect all equipment and storage containers that come into contact with the collected material.

PIs shall also research the species and population to be studied to determine if there is an established history of disease associated with the animals. If the associated diseases are zoonotic (affecting both animals and humans), the PI shall consult with the [Occupational Health Manager](#) (OHM) to see if a vaccine is available. For example, there is a well-established incidence of rabies in North American arctic fox and skunk populations. PIs studying wild populations of these species shall have their research personnel immunized against rabies or personnel shall sign a waiver formally declining the vaccine.

### **Animal Research**

The Faculties of Medicine & Dentistry, Agriculture, Life and Nutritional Sciences, and Science each have their own animal vivarium space and animal care personnel. These vivaria were constructed to contain animal allergens, to provide an optimal environment for the animals, and to prevent infectious pathogens from crossing between humans and animals (in either direction). These spaces also have well-established procedures for the efficient cleaning of cages, care of animals, and disposal of associated waste material. PIs are encouraged to house their animals in established U of A vivaria and should contact their Faculty Animal Care Director to make arrangements for housing and procedural space. The University Veterinarian can provide assistance to individual PIs whose faculty does not operate a vivarium. To contact the various U of A Animal Care Directors:

- Health Sciences Laboratory Animal Services – [click here](#)
- Biosciences Animal Service – [click here](#)
- Agricultural, Life and Environmental Sciences Animal Services – [click here](#)
- University Veterinarian – [click here](#)

Recognizing that not all animal research can be housed in existing U of A Animal Service vivaria, the University does occasionally allow PIs to house animals in their laboratory space. For permission to house animals in laboratory space, contact the [University Veterinarian](#). As part of the approval process for alternate animal housing locations, the laboratory shall be audited by the Biosafety Division to ensure that the room ventilation is adequate, and that dander and odors from the animals will not cause an undue nuisance to personnel in neighboring areas. The research group shall also make arrangements with Animal Services for provision of the animals and for pick-up/disposal of animal waste material.

PIs working with insects shall contact the [BSO](#) to confirm that proper containment measures are in place.

## **Invasive, Non-Indigenous Plant or Animal Species**

Invasive, non-indigenous plant or animal species include novel genetically modified species that were created in the laboratory and have no equivalent in the natural environment. The containment parameters and practices used with these species shall be reviewed by the Biosafety Division to ensure that animal species do not escape and that viable pollen, seed or other material is not released into the environment. CL-2 facilities or modified CL-1 facilities will be required for laboratory work with invasive, non-indigenous species. For greenhouse work or field trials with non-indigenous or genetically-modified plants, consult the [CFIA Plant Control website](#) for containment practices. For field trials using genetically modified animals, contact the [Biosafety Division](#) for more information.

## **Combinations of Biohazards**

Many research groups will work with multiple types of biohazards. Research groups are expected to operate at the containment level required for their most hazardous biological materials. For example, if a group is working with 50 different strains of eukaryotic cell cultures but only one of the strains is rated as a risk group 2 agent, the group must still operate its laboratory as a CL-2 space.

*Active Biohazardous Agents* – Refers to those biohazardous materials that are being manipulated or cultured by the research group either currently or within the next year.

*Archived Biohazardous Agents* - Refers to those biohazardous materials that have been stabilized for storage for future analysis or research. Archived materials shall be reviewed annually by the PI to determine if they are still viable and required. Destruction and disposal of archived stocks shall be reported to the Biosafety Division.

## **Research Manipulation Details**

For evaluation of containment parameters and laboratory set-up, it is also important to describe planned manipulations of biohazardous materials. Some manipulations may necessitate a higher containment level. For example, if conducting aerosolization studies with a risk group 2 agent that can infect through the respiratory route, it may be necessary to upgrade the work to a CL-3 facility. Conversely, if working with cultures of attenuated vaccine strains of risk group 3 agents, it may be possible to downgrade the work to a CL-2 facility.

## **Part E: Safety Measures**

*Personal Protective Equipment (PPE)* - The standard PPE for CL-2 laboratories at the U of A is:

- Safety glasses with side shields (standard prescription eyewear is not equivalent as it does not offer side protection and most modern designs also feature minimal frontal protection),
- Fully-fastened laboratory coat or gown,
- Disposable laboratory gloves (i.e., latex, nitrile),

- Floor-length pants, and,
- Closed-toe shoes.

These items shall be worn whenever the person is conducting active research in the CL-2 laboratory or is working with human body substances. In the summer months, personnel may elect to wear shorts or opened-toe shoes to work but must change into appropriate laboratory wear before entering the laboratory.

Minimal PPE requirements for CL-1 laboratories at the U of A are safety glasses and a fully fastened laboratory coat. Prudent use of additional PPE as described for CL-2 laboratories may also protect the user from spills and materials being handled from contamination.

Respiratory protective equipment (RPE) may be required if the research group is working with biohazardous material that could be infective through inhalation. Selection of appropriate RPE and respirator fit-testing shall be arranged through EHS. A [Respirator Wearer's Questionnaire](#) shall be completed prior to fit-testing and use of a respirator, and submitted to the [Occupational Health Manager](#).

*Immunization* – List all vaccinations required for research personnel. The Biosafety Division will consult with the OHM to ensure that the vaccines are available.

*Anti-Toxin* - Anti-toxins are available for some microbial toxins. Most anti-toxins have a very limited shelf life and can be difficult to acquire. PIs who wish to work with microbial toxins shall identify them here so that the OHM can determine if the anti-toxin is readily available and, if so, can outline a procedure for its acquisition.

*Anti-Venom* - Anti-venoms are available for many reptile and insect venoms. However, because there are few indigenous venomous species in the Edmonton area, **local hospitals do not stock anti-venoms**. If a group wishes to work with venoms they shall identify them here so that the OHM can determine if the anti-venom is readily available and, if so, can outline a procedure for its acquisition.

*Aerosol-Containment Device* - Used for procedures with the potential to produce infectious aerosols and for high concentrations or large volumes of infectious material. When properly maintained and used in conjunction with good laboratory techniques, biological safety cabinets (BSCs) and shrouds provide effective primary containment for work with human pathogens. These devices must be certified annually to ensure that their HEPA filters and ventilation systems are functioning optimally. Declaring the device in Part E of the registry application will allow for it to be entered into the Biosafety Division's certification program. Types of aerosol-containment devices include:

1. *Biological Safety Cabinets (BSCs)* - Provide protection from aerosols to the product, the user and to the surrounding environment. On the U of A campus there are two common classes of BSC:
  - *Class II-A BSCs* successfully remove biohazardous agents from the air in the cabinet and recirculate the HEPA-filtered air back into the laboratory. Because they return the filtered air back into the laboratory, they are inappropriate for projects involving a combination of biohazardous agents and volatile chemicals, anesthetics, or radioactive isotopes.
  - *Class II-B2 BSCs* filter air through a HEPA filter and exhaust the air out of the laboratory through a hard-ducted ventilation system. This class of cabinet is appropriate for research with a combination of biohazardous agents and volatile chemicals, anesthetics, or radioisotopes. Class II-B2 cabinets are also recommended for use with nanoparticle technology as HEPA filtration may not fully suppress aerosolized nanoparticles due to their extremely small size.

2. *Microscope & Equipment Shrouds* - May be used with equipment that does not easily fit in a BSC. Shrouds may be commercially purchased or custom-made and are meant to enclose the parts of the device where hazardous materials are handled. The enclosed area is outfitted with a fan that pulls air in the space away from the user and any entry ports to the back of the enclosure where it is drawn through a HEPA filter. Shrouds provide protection to the user, product, and environment.
3. *Chemical Fumehoods* - Protect the user from the product being manipulated but do not produce an air curtain to protect the product from the contaminants in the room. Culture work in a chemical fumehood will invariably become overgrown with contaminants. With no HEPA-filter on the fumehood's exhaust ventilation, aerosolized biohazardous agents will be drawn up the stack and released into the environment. Furthermore, aerosolized agents may adhere to the inner surfaces of the exhaust ventilation and later pose a risk to personnel servicing the fumehood. Because decontamination of chemical fumehoods is difficult to achieve, they should be used sparingly with biohazardous materials. See section on "Microbial, plant and animal toxins" for safe handling of toxins in a chemical fumehood.

**Note:** two pieces of equipment that should **not** be used with biohazards are:

- *Laminar Flowhoods*, and
- *Clean Air Benches*.

These are **not** aerosol containment devices. They protect the product but **do not** offer protection to the user or environment against aerosolized agents. In fact, they will actually blow any aerosols created by research manipulations back into the face of the user and all over the research laboratory.

For advice on selecting appropriate bioaerosol containment devices that are compatible with the U of A's maintenance and certification program, contact the [Biosafety Technologist](#). **Note:** if an aerosol containment device is shared between research groups, these groups shall consult together to ensure that decontamination procedures used with the device are appropriate against all biohazardous materials handled within the device.

*Emergency Eyewash* – Emergency eyewashes should be hard-plumbed with tempered water and a drain; eyewashes should be flushed weekly. Bottled eyewash stations are in use at the U of A but must be cleaned and refilled every three months to combat microbial growth. Alternatively, any purchased, bottled eyewash must be replaced based on the manufacturer's expiry date or after the seal has been broken. Access to any type of eyewash shall be unimpeded and within a ten-second walk from laboratory work space.

*Emergency Shower* - Like plumbed eyewashes, emergency showers should provide tempered water, be outfitted with a drain, and be within a ten-second, unimpeded walk from laboratory work space. Regular personal showers provide a greatly reduced flow rate and are not considered substitutes for emergency showers. Combination eyewash/emergency shower stations are available from most industrial and biotechnical supply companies.

## **Part F: Waste Management**

*Autoclave Bags, Sharps Containers & Incineration Boxes* – It is the responsibility of the research group to supply their own autoclave bags, hard-plastic sharps containers, and incineration boxes. These materials are available in a wide range of sizes from most general biotechnical supply companies (i.e., Fisher, Sigma-Aldrich). Materials shall not be autoclaved in bags displaying the biohazard symbol if they will be

disposed of in the regular waste stream afterwards. Instead, the research group shall use a two-bag system wherein a clear, unlabelled autoclave bag is placed inside a second autoclave bag displaying the biohazard symbol. When two-thirds full, the inner unlabelled bag is autoclaved while the second bag with the biohazard symbol remains in the waste receptacle in the laboratory.

*Autoclave Cycle Suggestions* – The effectiveness of an autoclave depends on how well steam can penetrate its load. The greater the volume or density of the load, the greater the treatment time required. Treatment time is defined as the length of time the autoclave load is maintained at 121°C during the cycle; additional time may be required to heat the load up to this temperature and to cool the load down after treatment. Below are some general guidelines for autoclave treatment times:

- Loosely-packed solid waste requires a minimum of 30 minutes treatment time
- Densely-packed solid waste (animal bedding, large amounts of paper or laundry) requires the addition of 500 ml of water to each bag and treatment for a minimum of 45 minutes
- Single volume of liquid material (including culture media) of 500 ml or less requires a minimum of 20 minutes
- Single volume of liquid material (including culture media) of 500 to 2000 ml requires a minimum of 45 minutes
- Single volume of liquid material (including culture media) of greater than 2000 ml requires a minimum of 60 minutes
- The above times should be doubled for material contaminated with bacterial or fungal spore-forming species.

*Waste Pick-up* – To arrange for EHS pick-up of properly packaged biohazardous, chemical, and radiological waste, research personnel must be registered with the EHS Hazardous Waste Management online program (CHEMATIX). This system is designed to streamline the waste handling process by enabling users to process the removal and disposal of hazardous materials in a timely and efficient manner. User training is available through EHS. Contact the EHS [Environmental Officer](#) to subscribe to CHEMATIX. **Note:** because federal regulations prohibit storage of biohazardous waste for more than 24 hours at room temperature, groups wishing to use the EHS pick-up service for biohazards will also have to identify appropriately-sized refrigerated space for interim storage of their waste.

### **Additional Information**

The following information may be useful for PIs setting up a new biological or medical research laboratory at the U of A. Where applicable, click on a heading to access the relevant document.

**[University of Alberta Biosafety Manual](#)** - Investigators conducting biological or medical research shall have access to, or a copy of, the current version of the U of A Biosafety Manual in their laboratories. The manual is a useful resource for laboratory biosafety and also provides information on legislation and other regulations pertaining to biosafety. The latest version of the Biosafety Manual along with other pertinent biosafety guidelines and forms will always be found at the [EHS Biosafety Division webpage](#).

**[Biological Spill Remediation Protocol](#)** – Outlines the materials required to set up a biological spill remediation kit for a laboratory and contains a step-by-step procedure for the safe clean-up of spills. All biological or medical laboratory space shall contain a biological spill kit or have ready access to a shared kit.

***Laboratory Incidents & Injuries*** – All laboratories incidents and injuries, no matter how slight they may appear initially, must be reported to EHS. Even if the incident was successfully contained and mitigated

by the research group (e.g., successful clean-up of a spilled bacterial culture with no exposure of personnel), it must still be reported to EHS for federally-mandated tracking purposes and to allow for a review of mitigation protocols used to ensure they were appropriate.

To inform EHS of an incident not involving potential exposure of personnel to human blood or body fluids, the personnel involved and their supervisor shall complete and submit a signed [Faculty/Department Incident & Investigation Report](#). The personnel involved in the incident will complete the first page of the report form immediately following resolution of the incident and will then forward the report form on to their supervisor to complete the second page including development of corrective actions to prevent a similar incident from occurring in the future. The research group will then submit the completed and signed form to EHS via fax (780-492-7790) or campus mail within 24 hours of the resolution of the incident.

If the incident involved the potential or confirmed exposure of personnel to human blood or other body fluids then the research group shall fill out a [Human Blood/Body Fluid Exposure Report](#) instead of the Faculty/Department Incident & Investigation Report. The affected individual and their supervisor will complete the first page of the report immediately following the incident and the affected individual will take the form with them to the University Health Centre (2-220 Students' Union Building) for a medical assessment. If the incident occurs after-hours, the affected individual should report to the University of Alberta Hospital Emergency. The attending physician will complete the second page of the form. The original form is to remain with the attending physician; however, the affected individual shall retain a copy of their own and forward copies to the Occupational Health Manager (fax 780-492-7790) and to the individual's Department/Faculty within 24 hours of the resolution of the incident.

If - during the incident - anyone was injured, he or she shall complete the Workers' Compensation Board (WCB) [Worker's Report of Injury or Occupational Disease](#) and [Employer's Report of Injury or Occupational Accident](#), respectively. These WCB reports shall be completed in addition to the Incident Investigation or Human Blood Exposure forms described above. The affected individual and their supervisor shall retain copies of their WCB reports for their files and shall submit the completed originals to the U of A WCB Claims Administrator (fax 780-492-0798) within 48 hrs of the incident.

***Working Alone Protocol/Template*** - To ensure compliance with Part 28 of the Alberta Human Resources and Employment Occupational Health & Safety Code, EHS requires that all laboratories develop a protocol to protect any individual who might be working alone either during regular business hours or after-hours.

***Transportation of Dangerous Goods (TDG)*** - TDG certification is required for individuals who transport, receive or package hazardous materials for transport including biohazardous materials rated risk group 2 or greater.

Each U of A department should have two or three individuals with TDG certification who can package and receive hazardous materials. Research groups that occasionally ship or receive hazardous materials shall consult with the department's administrative staff to determine who their TDG representatives are. If the department does not have any personnel with current TDG certification, the Department Chair shall nominate people to fill this role.

To enable self-sufficiency, research groups that will be regularly shipping or receiving hazardous materials shall arrange for one or two representatives of their group to complete TDG training. Additionally, if a research group will be conducting field research and shipping hazardous materials back to the University (i.e., tissue samples from animal populations experiencing an outbreak of a zoonotic pathogen), members of the field team must have valid TDG certification.

TDG recertification is required every three years. For details on enrolling in a TDG course, consult the [EHS website](#).

***Importation of Biohazardous Materials*** – All biological materials rated risk group 2 or greater require an importation permit from the overseeing federal regulator before they can be brought into Canada. If the agent causes disease in humans, the research group must apply for an import permit from PHAC. If the agent causes disease in animals, the research group must apply for an import permit from the CFIA. If the agent is zoonotic and causes disease in both humans and animals, import permits will be required from both PHAC and CFIA. To apply for an importation permit, contact the [Biosafety Division](#).

Recently, federal regulators have started to require import permits for biological preparations containing select microbial toxins. As a result, some distributors may require an import permit prior to delivery of affected biological preparations. Please contact the [Biosafety Division](#) for assistance in this situation.

If a new PI wishes to have biohazardous agents imported from a previous research location, the federal regulators prefer that the material be securely stored at the old research location until the new location at the U of A is operational. If storage at the old location is not possible and new laboratory space is not yet active, please contact the [BSO](#) to make alternate arrangements.

***Clearance to Work in Hazardous Area Form*** – Must be completed by the research group before maintenance, repairs or renovations may be undertaken in the laboratory. The purpose of the form is to confirm that surfaces involved in the repair or renovation have been properly cleaned and disinfected, and that any hazardous materials used in the location have been secured. This helps to ensure a safe work environment for the maintenance/construction workers. It is recommended that a representative from the research group liaise with the maintenance/construction workers during the repair/renovation process. Where renovations exceed 50% of the laboratory, a [Laboratory Close-Out Procedure Form](#) must be completed instead (see below).

***Laboratory Close-Out Procedure Form*** - Used when a PI vacates a laboratory or a large-scale renovation is planned. The document confirms that the research space has been properly cleaned and decontaminated, and that all hazards used in the space have either been secured in a new location or properly disposed of prior to a new PI moving into the space or workers entering the space to initiate renovations.

***Equipment Decontamination Form*** - Used when intending to transfer equipment from one laboratory to another or to surplus old equipment. Without a completed equipment decontamination form in place, Supply Management Services will not pick up the equipment for transfer. There are separate forms to complete for equipment used with either radiological or biohazardous materials:

- [Radiation Equipment Decontamination form](#)
- [Biohazards Equipment Decontamination form](#)

***X-rays & Lasers*** – X-ray generating equipment or class 3b or 4 lasers must first be certified by the [Radiation Protection Officer](#).

### *Other EHS Safety Manuals*

1. [\*Health and General Safety Handbook\*](#) – A resource to identify general hazards in the workplace and to enable U of A departments to craft their own custom-designed health and safety manual. For questions pertaining to general safety, contact the [General Safety Officer](#).
2. [\*Laboratory Chemical Safety Manual\*](#) – A reference manual developed to provide information on safe use, storage and disposal of laboratory chemicals. The Laboratory Chemical Safety Manual incorporates both general guidelines as well as more in-depth information on safety practices involving chemicals in the laboratory. For questions pertaining to chemical safety, contact the [Occupational Hygienist](#).
3. [\*Radioisotope Code of Practice\*](#) – To provide specific guidance to persons who intend to handle or use radioactive substances. It covers both regulated and exempt radioactive substances and discusses the requirements for safe handling of radioactive substances. For questions pertaining to radiation safety, contact the [Radiation Protection Officer](#).