

LAB SPECIFIC BIOSAFETY PLAN TEMPLATE FOR BSL-2

Name of Principal Investigator:	
Blazer ID:	
Department:	
Laboratory location:	

Hazard Communication

Risk Group 2 (RG2) infectious agents are used in this laboratory. RG2 agents are associated with disease that can cause infection of varying severity (rarely lethal). Host immunity is usually capable of controlling the infection and preventable or therapeutic interventions are often available. If you are immune compromised, you may be at greater risk for an infection if exposed.

Standard Microbiological Practices

1. Access to areas containing RG2 agents is limited or restricted by the Principal Investigator.
2. Persons must wash their hands after working with RG2 agents and before leaving the room where there are utilized.
3. Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption must not be permitted in areas containing RG2 agents. Food must be stored outside the laboratory area in cabinets or refrigerators designated and used for this purpose.
4. Mouth pipetting is prohibited; mechanical pipetting devices must be used.
5. Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented. Whenever practical, supervisors should adopt improved engineering and work practice controls that reduce risk of sharps injuries. Precautions, including those listed below, must always be taken with sharp items. These include:
 - Careful management of needles and other sharps are of primary importance. Needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal.
 - Used disposable needles and syringes must be carefully placed in conveniently located puncture-resistant containers used for sharps disposal.
 - Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.
 - Broken glassware must not be handled directly. Instead, it must be removed using a brush and dustpan, tongs, or forceps. Plastic ware should be substituted for glassware whenever possible.
6. Wear appropriate PPE while handling pathogen and perform all procedures to minimize the creation of splashes and/or aerosols.
7. Decontaminate work surfaces after completion of work and after any spill or splash of RG2 agents with appropriate disinfectant.

8. Decontaminate all cultures, stocks, and other potentially infectious materials before disposal using an effective method. Depending on where the decontamination will be performed, the following methods should be used prior to transport.
 - Materials to be decontaminated outside of the immediate laboratory must be placed in a durable, leak proof container and secured for transport.
 - Materials to be removed from the facility for decontamination must be packed in accordance with applicable local, state, and federal regulations.
9. A sign incorporating the universal biohazard symbol must be posted at the entrance to areas where RG2 agents are present. The sign must include the biosafety level, the name and phone number of the supervisor (or other responsible personnel). RG2 agent information should be posted in accordance with the institutional policy.
10. An effective integrated pest management program is required.
11. The supervisor must ensure that laboratory personnel receive appropriate training regarding their duties, the necessary precautions to prevent exposures, and exposure evaluation procedures. Personnel must receive annual updates or additional training when procedural or policy changes occur.
12. Personal health status may impact an individual's susceptibility to infection, ability to receive immunizations or prophylactic interventions. Therefore, all laboratory personnel and particularly women of childbearing age should be provided with information regarding immune competence and conditions that may predispose them to infection. The individual is responsible for informing The UAB Employee Health Program when medical conditions arise that may impact their susceptibility to infection, ability to receive immunizations or other medical interventions. They can do this by contacting (205-996-7817) to schedule a consult to determine what measures need to be taken to assure that they are adequately protected in the laboratory environment.

BSL-2 Containment:

This biosafety level applies to work with agents associated with human diseases that pose a moderate health hazard. Examples of agents typically worked with in a BSL-2 facility include HIV, HBV, and HCV.

BSL-2 facilities require the same standard microbial practices as BSL-1 facilities, with enhanced measures due to the potential risk of human disease. Personnel working in BSL-2 areas are expected to take greater care to prevent exposures through percutaneous injury, ingestion, or mucous membranes. In addition to BSL-1 requirements, the following special practices are added for facilities designated as BSL-2:

Special Practices:

1. All persons entering the area must be advised of the potential hazards and meet specific entry/exit requirements. A "Biosafety Level 2" sign, with the biohazard symbol, the agents present, and the requirements for entry must be placed at each entrance.
2. Personnel must be provided medical surveillance, as appropriate, and offered available immunizations for agents handled or potentially present in the laboratory.
3. UAB does not bank serum samples from at-risk personnel.

4. A facility-specific biosafety manual (this document) must be prepared and adopted as policy. The biosafety manual must be available and accessible.
 - The supervisor must ensure that personnel demonstrate proficiency in standard and special microbiological practices before working with BSL-2 agents.
5. Potentially infectious materials must be placed in a durable, leak proof container during collection, handling, processing, storage, or transport within a facility.
6. Equipment that may be exposed to RG2 agents should be routinely decontaminated, as well as, after spills, splashes, or other potential contamination.
7. Spills involving infectious materials must be contained, decontaminated, and cleaned up by staff properly trained and equipped to work with infectious material.
8. Equipment must be decontaminated before repair, maintenance, or removal from the area.
9. Incidents that may result in exposure to infectious materials must be immediately evaluated and treated according to procedures described in the facility-specific biosafety manual. All such incidents must be reported to the supervisor. Medical evaluation, surveillance, and treatment should be provided and appropriate records maintained.
10. Animal and plants not associated with the work being performed must not be permitted in the areas where RG2 Agents are stored, dispensed, or administered.
11. All procedures involving the manipulation of infectious materials that may generate an aerosol should be conducted within a BSC or other physical containment devices.

Safety Equipment:

1. Properly maintained BSCs, other appropriate personal protective equipment, or other physical containment devices must be used whenever:
 - Procedures with a potential for creating infectious aerosols or splashes are conducted. These may include pipetting, centrifuging, grinding, blending, shaking, mixing, sonicating, opening containers of infectious materials, infusion, and harvesting samples.
 - High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory using sealed rotor heads or centrifuge safety cups.
2. Appropriate personal protective equipment (PPE) must be worn (**Specify PPE requirements**):

- **Protective coats, gowns, smocks, or uniforms** specified for use in the area must be worn while working with hazardous materials. Remove protective clothing before leaving the BSL-2 designated areas (e.g., cafeteria, library, and administrative offices). Dispose of protective clothing appropriately, or deposit it for laundering by the institution. It is

recommended that protective clothing not be taken home.

- **Eye and face protection** (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of RG2 AGENTS or other hazardous materials when these materials must be handled outside the BSC or containment device. Eye and face protection must be disposed of with other contaminated laboratory waste or decontaminated before reuse.
- **Gloves** must be worn to protect hands from exposure to hazardous materials. Glove selection should be based on an appropriate risk assessment. Gloves must not be worn outside the BSL-2 designated area. In addition, BSL-2 facility workers should:
 - Change gloves when contaminated, glove integrity is compromised, or when otherwise necessary.
 - Remove gloves and wash hands when work with hazardous materials has been completed and before leaving the BSL-2 designated area.
 - Do not wash or reuse disposable gloves. Dispose of used gloves with other contaminated waste. Hand washing protocols must be rigorously followed.

Facilities:

1. The facility doors should be self-closing and lockable, according to the institutional policies.
2. A sink and eyewash station should be readily available. The sink should be located near the exit.
3. The BSL-2 facility should be designed so that it can be easily cleaned and decontaminated.
 - *Carpets* and rugs are not permitted.
 - Furniture must be capable of supporting anticipated loads and uses. Spaces between benches, cabinets, and equipment should be accessible for cleaning.
 - Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.
 - Chairs used in RG2 agents work must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant.
4. An autoclave or an alternative method of decontamination is available for proper disposals.
5. Biohazard warning signs should be placed on all equipment used for processing and storage of RG2 AGENTS samples.

Agent-Specific Safety Practices and Procedures:

Please include an Agent-Specific Safety Data Plan for each agent (or group of agents) requiring specific handling or response procedures (See example in page 6)

Incident Response Plan

1. Is there an SOP for cleanup and reporting (Disinfectant used, contact time, reporting contact numbers)?
2. Exposure Response: Is there an exposure response plan?

References:

1. SOP #
2. SOP #
3. [NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules](#). National Institutes of Health.
4. Laboratory Biosafety Level Criteria, [Biosafety in Microbiological and Biomedical Laboratories, Ed. 6th](#). Centers for Disease Control and Prevention and the National Institutes of Health.



AGENT-SPECIFIC SAFETY PLAN

BIOLOGICAL AGENT(S): **HUMAN IMMUNODEFICIENCY VIRUS (HIV)**

PHYSICAL PROPERTIES:	
MORPHOLOGY (PARTICLE/GENOME)	Family: Retroviridae, Genus: Lentivirus. ssRNA, enveloped icosahedral nucleocapsid, of approximately 100 to 110 nm in diameter.
STRAINS/VARIANTS (DESCRIBE)	Strains: HIV-1 and HIV-2.

AGENT RISK FACTORS:					
RISK GROUP LEVEL		<input type="checkbox"/> RG-1	<input type="checkbox"/> RG-2	<input checked="" type="checkbox"/> RG-3	
HOST/VECTOR RANGE					
INFECTIOUS DOSE					
MEDICAL OPTIONS		<u>Prophylaxis</u> <u>NA</u>	<u>Vaccines</u> <u>Experimental</u>	<u>Treatments</u> Antiretroviral agents from 5 drug classes are currently available to treat HIV infection	<u>Surveillance</u> <u>NA</u>
SEVERITY OF DISEASE	UNTREATED:	<input type="checkbox"/> Mild	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Severe	<input type="checkbox"/> Lethal
	TREATED:	<input type="checkbox"/> Mild	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Severe	<input type="checkbox"/> Lethal
NATURAL MODES OF TRANSMISSION		Blood transfusion from an infected donor, needle sharing by infected injection-drug users, receptive anal intercourse, and percutaneous needle injuries.			
POTENTIAL LABORATORY EXPOSURE ROUTES:		<input checked="" type="checkbox"/> Mucosal membranes	<input checked="" type="checkbox"/> Parenteral inoculation or animal bite	<input type="checkbox"/> Ingestion	<input type="checkbox"/> Inhalation (droplet/aerosol)
SOURCE OF EXPOSURE:		Spills, Splashes, Contaminated gloves	Needlesticks, Sharps, Exposures to open wounds	NA	NA
ENVIRONMENTAL STABILITY		<input type="checkbox"/> Hours	<input checked="" type="checkbox"/> Days	<input type="checkbox"/> Weeks	<input type="checkbox"/> Months
GENETIC MODIFICATIONS (DOES THE MODIFICATION (S) ALTER ANY RISK FACTORS?)		NA			
REGIONAL PREVALENCE		<input checked="" type="checkbox"/> Indigenous	<input type="checkbox"/> Emerging	<input type="checkbox"/> Exotic	

PROCEDURAL RISK FACTORS:			
ANIMAL MODELS -METHOD OF EXPOSURE -PRODUCTIVE INFECTION?	AEROSOL-PRODUCING PROCEDURES	SHARPS USED	AGENT VOLUME/CONCENTRATION
	Pipetting, Sonicating, Centrifuging, Vortexing	Needles, Scalpels	
CULTURE/PROPAGATION METHODS	Projects will not involve large volumes of concentrated stock.		
DESCRIBE OTHER PROCEDURES THAT MAY POSE A RISK	Other Bloodborne pathogens present in human tissues.		
CONTAINMENT REQUIREMENTS:			
	BIOSAFETY LEVEL	ADDITIONAL CONSIDERATIONS (SPECIAL PRACTICES, SAFETY EQUIPMENT, AND FACILITY SAFEGUARDS NEEDED)	
LAB BSL1-3	2	BSL3 PRACTICES AND PROCEDURES (DOUBLE GLOVES, EYE PROTECTION, AND LAB COAT OR CLOSED-FRONT GOWN)	
ANIMAL FACILITIES ABSL1-3	NA		
POSTED SIGNAGE	RESTRICTED ACCESS: HIV, HUMAN TISSUES (BLOODBORNE PATHOGEN)		
PPE REQUIRED			
DISINFECTANTS & INACTIVATION	DISINFECTANTS (CONTACT TIME): FRESH 2% GLUTARALDEHYDE, 1% SODIUM HYPOCHLORITE	METHOD OF INACTIVATION HIV is inactivated by ultraviolet (UV) light, in close proximity; cell-free medium; pH higher or lower than 7.1; temperature higher than 60 C for at least 30 min.	
REQUIRED SAFETY TRAINING	Required OH&S Safety Courses: HS200, BIO301L, BIO303, BIO304, BIO500 * Training Matrix and Decision Tree: http://www.uab.edu/ohs/training *Classes are on The UAB Learning System: http://www.uab.edu/learningsystem		Investigator or Lab Provided Training: Agent-specific training (this document) and supervisor attestation of proficiency

EXPOSURE AND INCIDENT RESPONSE PROCEDURES:	
MUCOSAL MEMBRANES	Flush eyes, mouth or nose at eyewash station for 15 minutes
DERMAL	wash area with soap and water for 15 minutes
SYMPTOMS	DUE TO IMMUNODEFICIENCY, PATIENTS SUCCUMB TO VARIOUS FUNGI, PARASITES, BACTERIA, AND/OR VIRUSES AND ARE PRONE TO CERTAIN TUMORS

INCUBATION PERIOD	VARIABLE	
MEDICAL RESPONSE	Treatment for Exposures: See Flowchart SEE CURRENT FLOWCHART	LIFE THREATENING INJURIES • Campus phone : dial 911 • Outside line: 934-3535 TO SEEK MEDICAL ATTENTION AFTER HOURS • Report to the UAB Emergency Department • Or call (205) 934-4011 and ask to have the Employee Health nurse on call paged
SPILL RESPONSE	Small Spills: Notify others working in the lab (post sign at entrance). Allow aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply an EPA approved disinfectant, working from the perimeter towards the center. Allow appropriate contact time before disposal and cleanup of spill materials. Report incident to Biosafety representative at biosafety@uab.edu Large Spills: For assistance, contact Biosafety via EH&S On-Call (205) 917-4766.	
REPORTING	<p>1. Whether or not you're seeking medical attention, ALL incidents are reported to the lab supervisor</p> <p>Supervisor's name: <input type="text"/></p> <p>Emergency contact number: <input type="text"/></p> <p>2. Supervisors report ALL incidents to UAB Biosafety at biosafety@uab.edu</p> <p>3. Supervisors should also report all injuries/exposures requiring medical treatment to HR</p> <p>PLEASE SEE INSTRUCTIONS AND FORMS FOR ON-THE-JOB-INJURY FOR MEDICAL CLAIM COVERAGE, YOU MUST FILL OUT:</p> <p>1) An OJI Application for Benefits form, 2) A RELEASE OF INFORMATION FORM, 3.) The Trend tracker Incident Report</p> <p>***An incident/accident must be reported verbally by the employee to the employee's supervisor as soon as possible but no later than two calendar days following the incident/accident or following the onset of the illness or disease. Your failure to report an incident within two working days may jeopardize your On-the-Job Injury Program benefits.</p>	

ADDITIONAL REFERENCES:	
BMBL 6 TH EDITION	Biosafety in Microbiological and Biomedical Laboratories (BMBL) 6th Edition
CANADIAN MSDS	Pathogen Safety Data Sheets
CDC	https://www.cdc.gov
ABSA	https://my.absa.org/Riskgroups

SAFETY TRAINING DOCUMENTATION:		
BY SIGNING BELOW, I VERIFY THAT I HAVE COMPLETED AND UNDERSTAND ALL OF THE SAFETY TRAINING REQUIRED FOR THE PROCEDURES AND WORK WITH THE AGENT LISTED ABOVE		
NAME	SIGNATURE	DATE