I. Introduction

The University of Wyoming (UW) is committed to protecting the health and safety of students, employees, faculty, and volunteers at the various UW facilities. Therefore, it is UW’s policy to minimize biological hazards. The National Institutes of Health’s Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules requests that institutions using this biotechnology adopt emergency plans regarding accidental spills, personnel contamination, and waste disposal. These guidelines are written to meet these responsibilities.

II. Purpose

The purpose of this policy and associated Standard Operating Procedures are to ensure UW personnel have the knowledge needed to appropriately respond to a release or spill. The proper emergency response to a spill or release depends on the hazard of the biological agent and chemical, the volume of the material, and the location of the incident. Each lab and department must be prepared to contain and decontaminate spills they might generate. Preparedness includes knowledge of procedures and available personal protective equipment, having spill clean-up materials, an ample supply of chemical decontaminant, but also recognizing emergencies and when to call for emergency response.

III. Scope

This program applies to UW personnel (students, faculty, staff) who are required to work with biological agents.

IV. Definitions

Biological agents:

- Recombinant or synthetic nucleic acid molecules, transgenic plants, transgenic animals, and materials containing recombinant or synthetic nucleic acid molecules.
- Biologically active agents (i.e. toxins, allergens, venoms) that may cause disease in other living organisms or cause significant impact to the environment or community.
- Infectious agents or hazardous biological materials that present a risk or potential risk to the health of humans, animals to the environment. Includes organisms and viruses infectious to humans, animals or plants (e.g. parasites, viruses, bacteria, fungi, prions, rickettsia); infectious animal wastes.
Biohazardous wastes:

- Recombinant or synthetic nucleic acid molecules containing wastes: including animal wastes, animal bedding, transgenic plants, transgenic animals, and animal carcasses containing recombinant or synthetic nucleic acid molecules.
- Hazardous biological materials such as infectious agents (substances from or of biological origin), infectious animal wastes, and substances actually or potentially contaminated with infectious agents.
- Human blood, human blood components, and products made from human blood.
- Liquid, semi-liquid, and dried human blood, semen, vaginal secretions, amniotic fluid, deep tissue fluid, or unfixed tissues; and items contaminated by such materials that would release human blood or these potentially infectious materials in a liquid or semi-liquid state if compressed.
- Contaminated sharps, and pathological and microbiological wastes containing human blood or other potentially infectious materials.

Other Potentially Infectious Materials:

Potentially infectious body fluids and materials includes human semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental situations, any human body fluid with visible blood, all human body fluids where it is difficult or impossible to differentiate between body fluids, any unfixed tissue or organ (other than intact skin) from a human (living or dead), human sourced cell or tissue cultures, organ cultures, culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with human pathogens.

Large Spill

Large biohazardous spill are those involving spills of an agent requiring biosafety level 2 containment or greater, spills with biohazardous aerosols generated, and/or spills of large volume or of an infectious agent that constitutes a large risk if injury, illness or environmental harm.

Small Spill

Small spills are those involving low to moderate risk biological agents that can be dealt with by laboratory personnel, and the spill is of an amount that personnel are trained and have the capability to disinfect and clean with the spill clean-up materials on hand.

NIH Guidelines

The NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines) detail safety practices and containment procedures for basic and clinical research involving recombinant or synthetic nucleic acid molecules, including the creation and use of organisms and viruses containing recombinant or synthetic nucleic acid molecules.

NIH OBA

National Institutes of Health Office of Biotechnology Activities.
V. Responsibilities

A. University of Wyoming.

UW is responsible for ensuring the safety of its employees and for complying with the applicable requirements of Federal, State, and Local rules/regulations. UW Administration considers safety a priority and UW personnel are encouraged to promote a positive safety culture during their daily activities.

B. Biosafety Specialist

The Biosafety Specialist is responsible for maintaining, reviewing and updating this program. The Biosafety Safety Specialist must ensure Principle Investigators with personnel who may have exposure to biological agents and biohazards are aware of and able to implement this policy. The Biosafety Specialist must report any significant problems, violations of the NIH Guidelines, or any significant research related accidents and illness to the National Institutes of Health Office of Biotechnology Activities (NIH OBA). The Biosafety Specialist is also the Responsible Official for Select Agents and is required to report incidents involving biological select agents and toxins. The Biosafety Specialist reports to the Office of Research and Economic Development.

C. Principal Investigator

The Principal Investigator (PI) is responsible for full compliance with the NIH Guidelines in the conduct of recombinant or synthetic nucleic acid molecule research. The Principal Investigator is responsible for ensuring that the reporting requirements are fulfilled and will be held accountable for any reporting lapses. As part of this general responsibility, the PI should:

- Instruct and train laboratory staff in: (i) the practices and techniques required to ensure safety, and (ii) the procedures for dealing with accidents.
- Inform the laboratory staff of the reasons and provisions for any precautionary medical practices advised or requested (e.g., vaccinations or serum collection).
- Correct work errors and conditions that may result in the release of recombinant or synthetic nucleic acid materials.
- Ensure the integrity of physical containment (e.g., biological safety cabinets) and biological containment (e.g., host-vector systems that preclude survival of the agent outside the laboratory).
- Adhere to IBC-approved emergency plans for handling accidental spills and personnel contamination.

While conducting research subject to the NIH Guidelines, the PI must:

Report any significant problems pertaining to the operation and implementation of containment practices and procedures, violations of the NIH Guidelines, or any significant research-related accidents and illnesses to the Biosafety Specialist or IBC, and, as applicable, the Greenhouse or Animal Facility Director, and other appropriate authorities. The UW IBC sends the PI a listing of PI responsibilities in the
approval packet after the IBC approves a protocol for research at UW. A complete listing of PI responsibilities is in section IV.B.7. in the NIH Guidelines.

The Biosafety Specialist, IBC Contact persons, or other UW personnel will report to NIH OBA and other agencies as appropriate.

D. Department Directors, Managers and Supervisors

Department Directors, managers and supervisors must promote a safe work place and are responsible for ensuring these emergency response procedures are implemented. They must ensure spill clean-up supplies are available, and personnel are trained to use spill clean-up kits and to follow other procedures from this program appropriate to their work. Supervisors must report accidents, illnesses or violations of the NIH Guidelines to the Biosafety Specialist or the Institutional Biosafety Committee (IBC).

E. UW Personnel.

UW Personnel must promote a safe work place and follow the procedures described in this program. They must participate in and understand required training associated with working with biological agents and biohazards. They must report situations involving biological agents or biohazards to their supervisor and the Biosafety Specialist (766-2723) or Risk Management and Safety (766-5767). UW personnel must cooperate with investigating agencies.

VI. Implementation

A. Instructions:

Contact information is found in Appendix A.

Reporting instructions are found in Appendix B.

General instructions on how to respond to incidents and accidents involving biological agents and biohazards are found in Appendix B.

Instructions on how to dispose of biohazardous wastes are found in Appendix C.

B. Spill Kit Contents

1. Disinfectant (appropriate for the biological agents expected to be present in the laboratory e.g. 10% household bleach (5.25% sodium hypochlorite)

2. Absorbent Materials (e.g. paper towels)

3. Waste Container (e.g. biohazard bags, sharps containers)

4. Personal Protective Equipment (e.g. lab coat, gloves, eye and face protection)

5. Mechanical Tools (e.g. autoclavable forceps, dustpan and broom)
Appendix A: Contact Information

Emergency: 911

University of Wyoming:

UW Police Department, non-emergency: 307-766-5179

UW Safety Office: 307-766-3277. After hours call UW Police Department 307-766-5179

UW Regulated Materials Management Center (RMMC): 307-766-3698

UW Biosafety Specialist 307-766-2723

UW Responsible Official for Select Agents 307-766-2723

UW Alternate Responsible Official for Select Agents 307-766-9929 or 307-766-9939

UW Institutional Biosafety Committee: http://www.uwyo.edu/safety/biological/ibc.html

University Operations Service Desk: 766-6225

UW Director of Research Integrity & Compliance 307-766-3621

Medical:

Occupational health services by Grand Avenue Urgent Care: 307-760-8602

Ivinson Memorial Hospital Emergency Services 307-755-4410

State Agencies:

Wyoming Public Health Laboratory: 307-777-7431, after hours 1-888-996-9104 ask to speak to someone in the lab.

State Veterinarian (c/o Wyoming Livestock Board, 2020 Carey Avenue - 4th Floor, Cheyenne WY 82002-0051, Phone: (307) 777-7515 - Option 1 Fax: (307) 777-6561).

Wyoming Department of Health, 2300 Capitol Avenue Room 117, Cheyenne, WY 82002, Phone 307-777-7656 and Fax 307-777-7439. Ask to talk to the ARO or RO. If after hours, call the 24/7 All Hazards Response line 1-888-996-910, and ask to speak to “someone in the lab.”

Federal Agencies:

Centers for Disease Control and Prevention (CDC) Select Agent Program 404-718-2000, lrsat@cdc.gov.
Animal and Plant Health Inspection Service (APHIS) Select Agent Program 301-851-3300 option 3, AgSAS@aphis.usda.gov

Federal Bureau of Investigation (FBI), Cheyenne office 307-632-6224

National Institutes of Health Office of Biotechnology Activities (NIH OBA) http://oba.od.nih.gov

NIH Office of Biotechnology Activities, Senior Outreach and Education Specialist: Kathryn Harris, Ph.D., Phone: 301-496-9838 Fax: 301-496-9839 Email: harriskath@od.nih.gov.

National Institutes of Health Office of Science Policy (OSP) Completed reports may be sent to OSP via email at NIHGuidelines@od.nih.gov.
Appendix B: INSTRUCTIONS

1. Initial Emergency Instructions and General Follow-up

   A. Initial Steps:

   1. Provide assistance to persons involved and remove them from exposure to further injury if necessary. Do not move an injured person who is not in danger of further harm.
   2. Immediately call 911 if the situation is life or health threatening.
   3. Call the Safety Office (766-3277) if:
      a. Trained personnel and/or proper cleanup equipment are not available.
      b. You want advice.
   4. Attend to the incident as per Standard Operating Procedure.

   B. General Follow-up

   1. Seek medical attention for injury, illness or exposure that could result in illness.
   2. Notify the Biosafety Specialist.
   3. Submit a Workers Compensation claim to UW Human Resources (HR).
   4. Submit an accident report to the Safety Office, or if a visitor or student was involved, to Risk Management.
   5. The Biosafety Specialist or other UW designated personnel will report the incident to required agencies.

2. Reporting to Federal Agencies

   Contact information is located in Appendix A.

   A. Incidents involving recombinant or synthetic nucleic molecules.

   The Biosafety Specialist or other UW personnel as appropriate will report to NIH OBA significant problems with or violations of the NIH Guidelines. Also, any significant research related accidents or illnesses must be reported to NIH OSP within 30 days or immediately depending on the nature of the incident. Report accidents resulting in overt exposure or that otherwise leads to personal injury or illness or to a breach of containment.

   Examples of these kinds of events might include skin punctures with needles containing recombinant DNA, the escape or improper disposition of a transgenic animal, or spills of high-risk recombinant materials occurring outside of a biosafety cabinet. Failure to adhere to the containment and biosafety practices articulated in the NIH Guidelines must also be reported to
OBA. Minor spills of low-risk agents not involving a breach of containment that were properly cleaned and decontaminated generally do not need to be reported. OBA should be consulted if the Institutional Biosafety Committee (IBC), investigator, or other institutional staff are uncertain whether the nature or severity of the incident warrants reporting; OBA can assist in making this determination.

B. How to Report to the Office of Biotechnology Activities (OBA)

Report incidents to the Biosafety Specialist or if not present, to the Director of Research Integrity & Compliance.

The Biosafety Specialist or designate will report for the University any significant problems, violations of the NIH Guidelines, or any significant research-related accidents and illnesses to NIH OBA within 30 days.

Immediate reporting: Certain types of accidents must be reported on a more expedited basis. Spills or accidents in BL2 laboratories resulting in an overt exposure must be immediately reported to NIH OBA. Spills or accidents occurring in high containment (BL3) laboratories resulting in an overt or potential exposure must be immediately reported to NIH OBA.

One report for each incident or set of information is generally sufficient. More instructions and an incident reporting template is available from OBA to facilitate reporting of incidents under the NIH Guidelines. The template may be found at:

https://osp.od.nih.gov/biotechnology/nih-guidelines/

Completed reports may be sent to OSP via email at NIHGuidelines@od.nih.gov

C. How to Report Incidents Involving Select Agents

Report to the Biosafety Specialist who is also the UW Responsible Official for Select Agents (RO). The RO will report to the Federal Select Agent Program to either CDC or APHIS depending on the agent involved. If the RO is not available, contact an Alternate responsible Official. Phone numbers are listed in Contacts, Appendix A.

D. How to Report an Agricultural or Animal Emergency

The State Veterinarian must be notified. Call the Biosafety Specialist who will ensure reporting of the situation to State Veterinarian, and other State and Federal agencies as appropriate.

E. How to Report Incidents of Possible Criminal Nature

Call the UW Police Department. If a federal crime may be involved, the FBI will be informed by the UW Police Department or the Biosafety Specialist.

F. Reporting Requirements for Large Animal with Recombinant or Synthetic Nucleic Acid Molecules

When a large animal such as livestock or other animals covered by the NIH Guidelines Appendix Q containing recombinant or synthetic nucleic acid molecules or a recombinant or synthetic nucleic acid molecule-derived organism is euthanized or dies, the carcass shall be disposed of to
avoid its use as food for human beings or animals unless food use is specifically authorized by an appropriate Federal agency.

Appendix Q-I-B-2. requires a permanent record to be maintained of the experimental use and disposal of each animal or group of animals. Contact the Biosafety Specialist to maintain a permanent record.

3. Loss of Biological Containment

Loss of containment is an unplanned or uncontrolled release of a material from control or limits.

Steps:
1. Call for help. Alert the person assisting to stay a safe distance away.
2. Direct the person assisting to block the hall where the spill occurred.
3. If appropriate, ask the person assisting to direct the department office or work unit’s office to alert personal to avoid the hallway where the spill occurred, and Safety, or 911 if appropriate.
   
   Note: If building evacuation is necessary, do not activate the fire alarm system unless there is a fire. When the fire alarm system is activated, the building air handling system shuts down.
4. Ask the person assisting for other assistance if needed such as a spill kit for personnel decontamination.
5. Immediately notify the supervisor, who will immediately call the Biosafety Specialist and Safety. Report the theft, loss, or accidental release of any biohazard.
6. For small spills the PI or lab personnel should follow decontamination procedures. Or, if needed, allow the Haz Mat team decontaminate and clean up the spill (911 and UW Regulated Materials Management Center (RMMC).
7. Follow reporting and general follow-up procedures.

4. Personnel Exposure or Contamination

Steps:
1. Apply emergency first aid as needed or call 911.
2. Decontaminate person by cleaning exposed skin surface with soap/water, eyewash (eyes), or saline (mouth).
3. Notify supervisor.
4. Contact Ivinson Emergency Room, Grand Avenue Urgent Care, or a personal health care provider for treatment/counseling.

5. Follow reporting and general follow-up procedures.

5. Research Related Illness

A research related illness may be suspected if an illness develops with symptoms of those for the biological agent being studied.

Steps:

1. Contact Ivinson Emergency Room, a health care provider, or Grand Avenue Urgent care for treatment/counseling.

2. Notify supervisor.

3. Follow reporting and general follow-up procedures.

6. Spill Clean Up in Biosafety Level 1 and Biosafety Level 2 Laboratories

This section describes general spill clean-up procedures for work with Risk Group 1 or Risk Group 2 biological agents and biohazards that call for Biosafety Level 1 or Biosafety Level 2 containment. Any work with biological agents calling for Biosafety Level 3 containment must contact the Biosafety Specialist and develop laboratory specific procedures.

Use the Personnel Protective Equipment (PPE) specific for the laboratory and agent in use. At a minimum UW requires using safety glasses, gloves, and gown or lab coat. Respiratory protection may be required.

Report the incident as soon as possible to the Biosafety Specialist. The Biosafety Specialist will report to State and Federal agencies as appropriate. Any significant problems, violations of the NIH Guidelines, or any significant research-related accidents and illnesses must be reported to NIH OBA. Some accidents must be reported to the NIH OBA immediately.

For spills involving injury, illness, exposure or potential to biological agent, notify the Biosafety Specialist, submit a Workers Compensation claim to UW Human Resources (HR), and submit an accident report to Risk Management and Safety.

A. Large Spill of a Biohazard

Steps:

1. Leave area and close the door.

2. For a medical or fire emergency, summon emergency help immediately (911). If a fire emergency, activate fire alarm system.
3. Turn off room ventilation and evacuate building if appropriate. Know your building’s procedures for turning off ventilation. A call to University Operations (766-6225) may be necessary. For some buildings, simply pull the fire alarm to shut down ventilation.

4. Call for assistance or advice. Regulated Materials Management Center (766-3698), Biosafety Specialist (766-2723), Safety (766-3277), or the Laramie Fire Department (911).

5. Do not enter the room for 20-30 minutes to allow the bio-aerosols form the biological agent to settle. Warn workers in adjacent areas of any potential hazards to their safety.

6. Notify supervisor if not already notified.

7. If decontaminating and cleaning the spill, prepare Personal Protective Equipment, decontaminant, and cleaning supplies as per UW or laboratory specific and appropriate SOP.

8. Follow reporting and general follow-up procedures.

B. Biohazardous Spill Outside of a Biological Safety Cabinet

Steps:

1. Ensure biological spill kit is complete before starting the clean-up.

2. Enter room after 20 to 30 minutes to allow aerosols to settle.

3. Cover spill with paper towels.

4. Apply disinfectant slowly to outer margin of spill and allow the disinfectant to flow in.

5. Flood the spill with the appropriate disinfectant using care not to spatter.

6. Allow disinfectant to remain on the spill for the recommended contact time (see disinfectant label for instructions).

7. Remove broken glassware with forceps or broom and dustpan and dispose in sharps container. Do not pick up any contaminated objects with your hands. Place contaminated but reusable equipment into a container for autoclaving or other appropriate decontamination method.

8. Wipe off any residual spilled material and reapply disinfectant before final clean up. Wipe equipment with compatible disinfectant (e.g. non-corrosive). Rinse with water if necessary.

9. Dispose of paper towels and other disposable clean up materials into a biohazard bag. Dispose of sharp wastes into a sharps biohazard container. Manage the spill debris and clean up materials as you would manage your lab’s biohazardous waste. If needed call the RMMC (766-3697) for pick-up, treatment and disposal.
10. Reopen area to general use after spill clean-up and decontamination is complete. Call University Operations (766-6225) to return air ventilation to normal settings. Inform personnel and laboratory supervisor regarding the spill and successful clean up as soon as possible.

11. Notify supervisor if not already notified.

12. Follow reporting and general follow-up procedures.

C. Biohazardous Spill Inside a Biological Safety Cabinet

Chemical decontamination procedures should be initiated immediately while the cabinet remains in operational mode. This will help prevent escape of contaminants from the cabinet. Be careful with paper towels, which can be drawn into the blower fan or HEPA filters. Follow the procedure for decontaminating your lab’s biosafety cabinet or follow these steps below.

Steps:

1. Don gloves, a lab coat and safety glasses during the cleanup procedure. Spray or wipe walls, work surfaces, and equipment with an appropriate disinfectant (e.g., 1:10 dilution of household bleach).

2. Flood the top work surface tray and the drain pan below the work surface (if there is one) with an appropriate disinfectant and allow to stand at least 10 minutes or the recommended contact time listed on the label.

3. Remove excess disinfectant from the tray by wiping with a sponge or cloth soaked in an appropriate disinfectant. For Class II cabinets, drain the tray into the cabinet drain pan. Remove tray and removable exhaust grillwork, and wipe off top and bottom (underside) surfaces with a sponge or cloth soaked in an appropriate disinfectant. Then replace the grillwork and drain disinfectant from the drain pan into a liquid-proof container large enough to hold all the used disinfectant. Place gloves, cloth or sponge into an appropriate container for decontamination. Dispose or autoclave according to standard procedures.

4. Remove protective clothing and place in a biohazard bag for further processing by your laboratory’s laundry SOP. Operate cabinet at least 10 minutes after clean up and before resuming work. Inform personnel who use the cabinet as well as the laboratory supervisor regarding the spill and successful clean up as soon as possible.

5. Notify supervisor if not already notified.

6. Follow reporting and general follow-up procedures.
D. **Mixed Chemical and Biohazard Spill**

Steps:

1. Don gloves, a lab coat, safety glasses, and other PPE as per your laboratories procedures for the agents in use.
2. Confine spill to a small area while avoiding splashing to the extent possible.
3. Spray or wipe walls, work surfaces, and equipment with an appropriate disinfectant. Use a biohazard disinfectant that is also compatible with the chemicals involved or neutralize the chemical before decontaminating. For advice and assistance call the RMMC, or Biosafety Specialist.
4. Dispose the decontaminated waste as appropriate for the chemical agent, disinfectant, and the volume. Call the Biosafety Specialist, the Chemical Safety Specialist, or the RMMC for advice or assistance.
5. Notify supervisor if not already notified.
6. Follow reporting and general follow-up procedures.

E. **Solid Biohazard Spill**

1. Don gloves, a lab coat, safety glasses, and other PPE as per your laboratories procedures for the agents in use.
2. If the biological agent in use is risk group 1 or 2 (a biological agent that is not infectious via the aerosol route), carefully slide or sweep the spilled solid into a dustpan.
3. Place in appropriate container for decontamination as per your laboratory’s decontamination procedures, decontaminate the materials, and then dispose as per your laboratories’ procedures.
4. Notify supervisor if not already notified.
5. Follow reporting and general follow-up procedures.

F. **Radioactive Biohazardous Spill Outside of a Biological Safety Cabinet**

Radioactive materials spills are managed similar to spills of infectious agents, except that there is additional concern for the radiation hazard. In general, decontaminate the infectious nature of the spill as per SOP, and then follow spill clean-up procedures in the Radioactive Materials Safety Plan. Call the Risk Management and Safety Office for advice or assistance.

A final radioactive survey shall be made of the spill area, dustpan, squeegee, and forceps with an appropriate radiation measurement technique.

Follow reporting and general follow-up procedures.
Appendix C. Disposal of Biohazardous Wastes

A. Biohazardous wastes:

- Recombinant or synthetic nucleic acid molecules containing wastes: including animal wastes, animal bedding and wastes, and animal carcasses containing recombinant or synthetic nucleic acid molecules, transgenic plants, transgenic animals, and animal carcasses containing recombinant or synthetic nucleic acid molecules.
- Hazardous biological materials such as infectious agents (substances from or of biological origin), infectious animal wastes, and substances actually or potentially contaminated with infectious agents.
- Human blood, human blood components, and products made from human blood are potentially infectious.
- Liquid, semi-liquid, and dried human blood, semen, vaginal secretions, amniotic fluid, deep tissue fluid, or unfixed tissues; and items contaminated by such materials that would release human blood or these potentially infectious materials in a liquid or semi-liquid state if compressed.
- Contaminated sharps, and pathological and microbiological wastes containing human blood or other potentially infectious materials.

B. Treatment

1. Biohazardous waste materials must be treated to reduce biological activity before final disposal.

2. Use the right containers:
   a. Sharps (needles, syringes, razor blades) must go in puncture-proof and leak-proof containers, and sealed before pick-up. These containers must be in compliance with Wyoming OSHA 1910.1030 (d)(2)(viii)(A). They must be properly labeled to warn of hazardous waste inside the container.
   b. All other biohazardous waste should be placed in biohazard red bags and tied at the top.

3. Do not over-fill waste containers: Bags and other containers should not be filled such that they would rupture or are difficult to tie. When a container is full, a new one should be started.

4. Label containers with the orange biohazard symbol and the word “Biohazard”

5. Treat the waste by autoclave if an autoclave is present in or near your work area. Autoclave the waste containers in accordance with the SOP for that autoclave.

6. If you do not have a procedure for sterilizing your own biohazardous waste, request a pick up on-line at http://www.uwyo.edu/serverreports/HazPickUp.aspx or call the RMMC at 766-3697. Information on the kind of waste, how many containers and location should be provided to the RMMC. Ensure bags are tied or tightly sealed.
C. Disposal

Autoclaved/sterilized bags can go into the trash, but must be placed into a standard trash bag first so that no biohazard symbols can be seen.

The End

Please send you constructive comments, corrections and suggestions for the draft to dalrymp@uwyo.edu

Thank you.