



Albert Einstein College of Medicine

Biohazard Facility Manual

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I. Purpose

This Manual is designed to provide general operating and emergency procedures for working safely in the biohazard facility (BHF) located in the Chanin Building at Albert Einstein College of Medicine (“Einstein” or “College of Medicine”). This manual also defines the duties and responsibilities of all individuals using or operating the BHF.

II. Scope

The operating procedures detailed in this Manual shall apply to all staff, support personnel, and to any authorized visitors to the facility. It is essential that all personnel entering any laboratory in the BHF read and comply with this Manual.

III. Procedures

III.A. Forward

The BHF, located on the sixth floor of the Chanin Building, is designed to meet federal requirements for a Biosafety Level 3 (BSL-3) containment laboratory. Containment of biohazards is achieved through the use of primary control equipment, facility design, and laboratory procedures. Not all laboratories or animal rooms in the BHF are classified as BSL-3. Laboratories or animal rooms considered BSL-3 will be clearly marked at their entrance.

Biohazard containment in this facility will function properly if operational procedures are followed. The operational procedures described in this Manual have been designed to provide a high degree of protection to our workers and to the community from potentially infectious materials that may be used in this facility. We would like to emphasize that even the best containment facility and equipment is rendered ineffectual with improper laboratory procedures. Persons working in the biohazard facility must be trained and proficient in microbial practices and techniques before handling infectious or potentially infectious materials. The principal investigator (PI) is directly responsible for ensuring that each employee has received appropriate training and experience before beginning work in the BHF.

III.B. Roles and Responsibilities

III.B.1. Institutional Biosafety Committee

The Institutional Biosafety Committee (IBC) approves or rejects all proposals and research conducted within the BHF and also designates the biosafety level required. It is also responsible for reviewing activities which raise health and safety issues, reviewing the activities of the Environmental Health and Safety Department as it pertains to infectious agents, assessing containment levels, establishing a medical surveillance plan for all appropriate personnel, and reviewing any changes, challenges or grievances concerning research within the facility.

III.B.2. Biosafety Officer

The Biosafety Officer (BSO) is the administrator of the BHF. The BSO has the authority to determine whether an employee is unable to work within the facility, deactivate any malfunctioning containment equipment, and ensure compliance with governmental health and safety regulations. The BSO is responsible for coordinating meetings of the IBC, provide technical guidance and training materials to personnel regarding laboratory safety, revise day-to-day procedures as experience dictates, ensure that workers follow procedures and practices, advise Principal Investigators as to the proper functioning of their workers, initiate and supervise any needed emergency response, investigate and report to the IBC

and Principal Investigator any significant violations within the facility, and accompany authorized visitors or maintenance workers around and into the BHF.

III.B.3. Principal Investigator

The PI is immediately responsible to ensure that the purpose of this Manual and all other applicable guidelines are fulfilled. He or she should verify that all staff members conducting research within the BHF are properly trained, have read the BHF manual, and follow the specific protocols and policies related to the containment laboratories. The PI and his or her specific research projects must inform the laboratory staff of any potential hazards associated with their work including, biological, chemical, and radioactive hazards. The PI is responsible for investigating and reporting to the BSO, in writing, any accidents or incidents involving his staff in the BHF. The PI must also notify the BSO and the IBC of new employees who will be working in the BHF. All new employees must meet with the BSO before they are assigned to work in the BHF.

III.B.4. Individual Laboratory Worker

All personnel assigned to the BHF should read and comply with the procedures of this Manual and meet with the BSO before starting work. In addition, they should be clearly instructed by their PI as to the procedures they must follow while performing research in the BHF. The laboratory worker is responsible for properly labeling all biological, chemical, and radioactive materials within the facility. Any unsafe act or malfunctioning equipment should be brought to the immediate attention of the BSO and the PI. Employees should report to their PI and the BSO any instances which constitutes an exposure to biological, chemical or radioactive materials. Individuals who are pregnant or immunocompromised should seek medical advice before working in a BHF laboratory.

III.B.5. Authorized User

An authorized user of the BHF is an individual who has sufficient training and experience to work safely in this facility. The authorized user is selected by the PI assigned to the BHF and is approved or authorized to work in the area by the BSO and the IBC. This authorization can be rescinded. Periodically, the PI will provide a list of all authorized users permitted in the BHF.

III.B.6. Institute for Animal Studies

The Institute for Animal Studies is responsible for all research using animals. The Institute for Animal Studies reviews all research projects using animals, inspects animal rooms, maintains animals, posts hazard warnings on entrances to rooms, provides training to animal handlers, and assists with the proper disposal of animal waste.

Institution

The Institution assumes the responsibility for ensuring compliance with all guidelines within this Manual and other applicable guidelines including:

- CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 3rd edition, 1993.
- NIH - Working Safely with HIV in the Research Laboratory Biosafety Level, 2/3, 1988.
- CDC Guidelines for protection against Viral Hepatitis and Hepatitis B prevention.
- NCI Biological Safety Manual for Research Involving Oncogenic Viruses.
- CDC/NIH: Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets, 1st edition, 1995.

- NIH Guidelines on recombinant DNA Molecules, October 1997.
- OSHA Rule governing Occupational Exposure to Bloodborne Pathogens, 1990.
- CDC guidelines to prevent T.B. exposure.

III.C. Physical Containment Feature and Zone Classification

The purpose of containment is to reduce or eliminate exposure potential or risk of laboratory personnel and others, and to prevent escape of potentially infectious agents to the outside environment. Primary containment, the protection of personnel and the immediate laboratory environment from exposure to infectious agents, is provided by good microbiological technique and the use of appropriate safety equipment. Secondary containment, the protection of the environment external to the laboratory from exposure to infectious materials, is provided by the combination of facility design and operational practices.

The biological safety cabinets (BSC) are among the most effective, as well as the most commonly used, primary containment devices in laboratories working with infectious agents. These cabinets, when used in conjunction with good microbiological techniques, provide an effective containment system for safe manipulation of moderate and some high-risk microorganisms.

The two types of laminar flow biological safety cabinets utilized in the BHF are the Class II type B and Class III cabinets. The Class II cabinet is the most common and can be found in each laboratory. This BSC is designed for work with low to moderate risk agents, up to BSL3. The design features of this hood include an air barrier along the work opening to prevent the escape of biological agents into the laboratory, High Efficiency Particulate Air (HEPA)-filtered supply air across the work surface, and HEPA-filtered exhaust air.

The Class III cabinet, located in room 622 is designed for work with hazardous agents assigned to BSL3 or 4. This cabinet provides maximum protection to the worker and environment. The Class III BSC is a totally enclosed, ventilated cabinet of gas-tight construction with a non-opening view window. This cabinet operates under negative pressure and both supply and exhaust air is HEPA-filtered with the exhaust passing through a double HEPA filtration before being discharged. Manipulation of materials with the cabinet is through heavy-duty rubber gloves attached in a gas tight manner to ports in the cabinet. This system prevents direct contact with hazardous agents which are introduced into the cabinet via a double door pass-through box.

Secondary barriers are provided by special laboratory design features. A bioseal on the perimeter of the facility forms an integral shell which can be decontaminated when needed. All penetrations into the facility are sealed on both the clean and contaminated side of the room. The air-handling system in the facility is balanced such that the facility is negative to the rest of the building, the laboratories and animal rooms are negative with respect to the corridor, and the biological safety cabinets are negative with respect to the laboratories. Thus, the direction of the air flow is always toward the area of increasing hazard. Exhaust air from the facility is HEPA-filtered before being released to the environment.

Contaminated waste is removed from the facility via the pass-through autoclave. Animal carcasses and decontaminated materials are then transported to a pathological incinerator where materials are completely destroyed. All exhausts, including vents, and vacuum lines are all equipped with in-line HEPA filters.

Personnel access and egress for the facility is through the access corridor located at the north and south ends of the facility. This access corridor may also be used for the introduction of materials and equipment through the secondary barrier.

The facility is divided into two zones, potentially contaminated zone and non-contaminated zone. Potentially contaminated zone is the primary containment zone, which includes the class II and class III laminar flow biological safety cabinets constitute. All work requiring BSL-2 or 3 containment must be conducted within these cabinets.

The open laboratory consists of the space exterior to the BSC which is also considered potentially contaminated and constitutes the secondary containment zone. All work conducted in this space shall be in accordance with BSL-2 and 3 requirements. Another potentially contaminated zone also includes: the interior of the facility beyond access corridor, the ventilation system up to and including the HEPA filters and the sewage system.

The BHF interlocks at the North and South Corridor serve as a transition zone between the potentially contaminated and non-contaminated zones. The non-contaminated zone is associated with the area "external" to the interlocks. Entry into the interlocks is restricted to authorized personnel.

III.D. Facility Assignment Procedures:

Any investigator desiring use of the facility shall submit a written research proposal to the IBC and the BSO. This proposal must have the signature of the individual's departmental chairman. Space in the BHF is allocated on a temporary basis and only to those persons who have completed authorized user certification. This certification includes, but is not limited to, an orientation to the BHF and a review of procedures while working in the facility. The IBC will approve use of biohazard materials within the BHF. Biohazard material may not be used for any purpose, or in any other location, other than that originally approved by the IBC. Should a new project be initiated, a new written proposal should be submitted to the IBC and BSO. Personnel changes are to be reported to the BSO as they occur. Once a year, the BSO will generate a list of certified personnel and request that the PI verify that it is current.

Upon completion of a project, the investigator is required to decontaminate and remove all materials and equipment in accordance with established procedures. The BSO will ensure that all materials and equipment have been decontaminated prior to removal from the BHF laboratories.

III.E. Medical Considerations

III.E.1. Pre-Placement

All persons working in the BHF have the option of participating in a pre-placement/annual serum collection program. Please discuss this option with the PI or BSO.

III.E.2. Medical Restrictions

Pregnant women, persons on antacids, steroid therapy, or immunosuppressive drugs shall not work in the facility prior to a thorough evaluation of the risks involved. The decision to allow these persons to work in the facility is to be made by an appropriate physician and the responsible PI with notification to the BSO.

Persons with a fresh or healing laceration or skin lesions should not work with infectious material unless the injury is completely protected. Personnel with injuries of this type must notify their PI and the BSO prior to working in the facility.

III.E.3. Reporting

Emergency telephone numbers must be posted near entrances and at the telephones in every laboratory. Telephone numbers must include the PI, lab contact person, Environmental Health and Safety office and an emergency number.

Any illnesses or symptoms known to be associated with organisms, chemicals being used, or any change in medical condition should be immediately reported to the PI and BSO.

An incident report is to be completed by the investigator and forwarded to the Biosafety Officer as soon as possible after the occurrence of the following:

Physical injury - e.g., cut, burn, broken bone, slip/fall, other.

Hazardous materials exposure - contamination through parenteral exposure to a biohazardous material, exposure to a hazardous aerosol, ingestion of a contaminant, or exposure to a carcinogenic compound by inhalation, ingestion, or skin absorption.

Any spill involving a hazardous, chemical, biological, or radioactive material.

III.E.4. Medical Protection

Hepatitis-B vaccine is offered through Occupational Health to all "at-risk" personnel and is provided to the worker at no cost. Your Principal Investigator will determine if you are at risk of exposure to Hepatitis-B.

The BSO shall provide to all authorized users of the BHF, current information on the availability of any medical protection (i.e., vaccines) appropriate for the infectious agents used in the facility. This protection shall be offered to all "at-risk" personnel.

III.E.5. Medical Follow Up

In the event of an accidental parenteral exposure to HIV and/or HBV-related materials, perform immediate first aid and promptly report to Occupational Health. The Hepatitis-B vaccine will be offered and/or serology tested. With the individuals written consent a baseline HIV serology will be drawn, post exposure chemoprophylaxis will be administered, and HIV counseling will be provided. The Occupational Health Physician will determine and establish the appropriate medical interventions necessary to treat the exposure.

III.F. General Laboratory Safety

III.F.1. Equipment

Equipment to be utilized in the facility must meet building electrical safety standards, which refer to local and national codes. It is critical that equipment to be selected that:

- Does not contribute to spread of biohazards.
- Does not present a hazard to personnel or facility during operation.

It is essential that all equipment be properly maintained. If equipment malfunctions it should not be used and the BSO should be informed. Any equipment exiting the BHF must be decontaminated under the supervision of the BSO. Responsibility for cost, decontamination, or repair of equipment in individual laboratories falls to the Principal Investigators.

III.F.2. Physical Barrier Systems

The facility is equipped with Class II and III Biological Safety Cabinets which are designed to provide protection for personnel as well as materials within the cabinets.

The facility and its installed equipment are designed to provide physical barriers for personnel against exposure to biological hazards. The ventilation system is designed and adjusted to provide directional flow toward the area of increasing hazard. The general ventilation systems are HEPA-filtered to entrap infectious agents and to prevent dispersion outside of the BHF.

III.F.3. Biological Agents

All infectious and/or biologically hazardous agents being used in the BHF facility must have approval of the IBC and be registered with the BSO. A hazard warning sign incorporating the universal biohazard symbol should be posted on all the access doors into the laboratories or animal rooms. The hazard warning sign should identify the infectious agent, list the name and telephone number of the PI or other contact person, and indicate the special requirements for entering the laboratory. In addition, each laboratory or animal room will be given either a BSL-2 or BSL-3 designation on the entrance door. Transportation of infectious materials within the facility must be in a secured leak-proof, unbreakable container with an appropriate label. An absorbent material should be added to the container in case of breakage.

Procedures for handling and disposal of these agents are outlined below.

III.F.4. Chemicals

The handling of chemicals in the facility requires the exercise of proper controls in terms of the class of chemical and any associated hazard. As a general practice, the quantities of chemicals introduced into the facility should be kept to the minimum required for immediate operations. Excess storage of hazardous chemicals in the BHF should be avoided.

The disposal of acids, alkalis, and organic solvents into the sewer system is prohibited. Chemical waste should be containerized, surface decontaminated and appropriately labeled. The BSO should be contacted for proper disposal procedures.

Waste materials, (i.e., gloves, absorbent pads, culture flasks, etc.) shall be placed in autoclave bags and autoclaved. Liquid, infectious wastes shall be placed in a sealed container with a disinfectant, appropriately labeled, and surface decontaminated. Notify the BSO for proper disposal.

III.F.5. Radioisotopes

The introduction and the use of radioisotopes in the facility must be in accordance with regulations established by the Einstein Radiation Safety Officer (RSO). The PI must be authorized to use the radioisotope with approved handling, safety, and waste disposal procedures. Every attempt should be made to minimize the generation of mixed hazardous waste (infectious and radioactive) unless there is a clear, easy, and safe way to inactivate one of the hazardous components. Under no circumstance should mixed radioactive and infectious waste be transferred to the RSO without prior neutralization of the biological agent.

See Emergency Procedures Involving Radioactive Material on page 14.

III.F.6. Accidents and Injuries

The specific procedures regarding management and reporting of accidents or injuries shall be in accordance with Einstein rules and regulations. The PI should ensure that all personnel associated with the program are cognizant of these procedures. Any questions should be directed to the BSO. These procedures can be found below.

See Emergency Procedures on page 10.

III.F.7. Fire

The specific procedures regarding management and reporting of fire shall be in accordance with Einstein rules and regulations. The PI shall ensure that all personnel assigned to the facility are cognizant of these procedures.

See Emergency Procedures on page 10.

III.G. Safety Procedures

The BSL2 and 3 facility is specifically designed to conduct work involving biological material of potential hazard. All personnel must be advised of the potential hazards and instructed in the operational procedures of the facility and specific laboratory. Only persons authorized on the basis of program or support needs shall enter the facility. All personnel admitted into the facility shall read, understand, and follow the procedures detailed in the manual. Any questions regarding safety procedures in the BHF must be addressed to the PI, Institute for Animal Studies or BSO.

III.G.1. Personnel Practices

At the start, build safety into your procedures to minimize the likelihood of an adverse outcome.

Working in a relaxed, un-anxious, and non-hurried manner may help you to anticipate and avoid problems.

- A Tyvek® suit, disposable lab coat, or surgeon's gown shall be worn at all times in the BHF laboratories. The BSO may require a disposable Tyvek® suit and other protective equipment to be worn in various other locations within the BHF.
- Reusable lab clothing must not enter the BSL-2 and 3 laboratories. They must be stored in lockers (if available) or hung on hooks located within the interlocks or laboratory anti-chamber.
- Disposable gloves, provided by the PI, will be worn in the facility when handling biohazardous agents. The gloves should be taped to the cuff of the protective clothing to prevent any skin exposure. Powderless latex gloves are recommended for use when handling infectious material.
- Double gloving is required before penetrating the biosafety cabinet and removed on the way out of the cabinet.
- Special care shall be taken to avoid skin contamination with infectious materials and this could be a major route of personal exposure.
- Hands should be washed frequently during the day using the foot-operated faucet and germicidal soap provided in each laboratory. Ordinary soap and water is also effective in cleansing the hands.

It is mandatory to wash hands:

- After handling infectious materials.
- After a spill and appropriate clean up.

- When removing protective gloves.
- When exiting the laboratory.
- When exiting the facility.

Respiratory protection may be recommended when there is the possibility of hazardous aerosol generating procedures or as deemed necessary by the BSO. If you must wear a respirator, then you must be part of the Respiratory Protection Program which includes a medical evaluation and a fit test.

- Head coverings may be required, particularly, with long hair. Long hair should be covered or pinned up.
- Contact lenses do not provide eye protection. It is strongly recommended that contact lenses not be worn while conducting work in the laboratory. Safety goggles with side shield, goggles, or a plastic face shield should be worn for eye protection.
- Smoking, food, beverages, and cosmetics are not permitted in the BHF.
- Mouth pipetting, under any circumstances, is not permitted.
- Disposable cleaning tissue should be used rather than personal handkerchiefs.
- Personnel must notify the PI and the BSO of any event or incident which may compromise the safety of personnel or work.

III.H. Emergency Telephone Numbers

EMERGENCY (All Hours) Dial X 4111

Emergencies include:

- Fire
- Biohazard Spill
- Chemical Spill
- Radioisotope Spill
- Medical Emergency

State the nature of the emergency and the location. If possible, remain nearby to direct the emergency response team.

Biosafety Officer X3560
 Health and Safety Office X4150
 Radiation Safety Office X2243
 Engineering X3000
 Security X2019

Always notify Environmental Health and Safety in an emergency or accident!

III.I. Emergency Procedures

III.I.1. Injuries and Illnesses

Serious Injury or Sudden Illness:

- Dial the emergency number 4111, when special first aid, resuscitation, transport, or rescue service is required. Clearly describe the situation and your location.

- Place all contaminated materials in either a biological safety cabinet or appropriate containment so that medical help can enter the facility.
- Notify the PI and BSO.

Minor Injuries:

- Report all incidents to the PI and BSO.
- A first aid kit is located on the wall in the access corridor near the eyewash station. The use of the first aid kit does not preclude a visit to Occupational Health.
- Obtain an "Accident/Incident Report Form" from the PI, and report all injuries to Occupational Health for treatment and the BSO

Emergencies include, but are not limited to, a biohazardous or hazardous chemical spill, fire, BSC malfunction, or a total power failure. The primary objective in an emergency is preservation of personal safety and health. Protecting the facility and the experiment are secondary to personal safety. If there is a hazardous spill in your work area and you are not wearing a respirator, hold your breath and evacuate the room.

III.I.2. Basic Principles

Immediate personal safety overrides maintenance of containment. Evacuation takes priority. Get people out of the emergency area. If possible, biohazardous materials should be covered and contained. All equipment should be turned off. The BSO must be informed as soon as possible and will take charge of re-entry, clean-up, and other corrective measures.

The PI or BSO is responsible for deciding whether to override containment procedures in case of serious injury or sudden illness.

It is essential that the authorized users of the BHF familiarize themselves with the procedures detailed here. Questions about these procedures should be directed to the PI and the BSO. BHF personnel should be aware of all exits, interlock override switches, fire extinguishers, fire alarms, eyewash stations, safety showers, spill and first aid kits. **KNOW WHAT TO DO BEFORE AN EMERGENCY OCCURS.**

III.J. Biohazard Spill Outside a Biological Safety Cabinet (BSC)

If biohazardous material is spilled in the open laboratory, one must avoid inhaling any airborne infectious material and getting the infectious agent onto your body and clothing. A "spill kit" is available in the facility supply closet, C-673. You should always have available a freshly prepared solution of a disinfectant in the event of a sudden spill. The BSO should be notified once the contaminated laboratory has been evacuated. Others in the area are to be warned against entry.

Immediate Spill Control:

- Don't breathe; evacuate all personnel and close the door.
- Remove contaminated clothing carefully, folding the contaminated area inward. Place clothing in a bag or directly into the autoclave.
- Thoroughly wash hands and face and any exposed area of the body. Shower if necessary.
- Notify the BSO and PI.
- **POST SIGNS WARNING OTHERS NOT TO ENTER CONTAMINATED AREA. NO ONE SHOULD ENTER THE ROOM FOR AT LEAST ONE HOUR.** (This allows aerosols to be carried

away and heavier particles to settle.) Time should be taken to formulate a plan to decontaminate. Once all personnel have been removed from the area, there is no need to rush into the contaminated area.

- Assist the BSO as necessary. Decontamination will involve treatment of gross contamination by local application of disinfectant and possible gaseous decontamination of the entire working space.

Gaseous decontamination is listed below on page 14.

Decontamination of a Spill:

- Re-entry into the facility must be delayed for a period of at least one hour to allow reduction of the potential aerosol generated by the spill.
- Dress in protective clothing, including a Tyvek® suit and double gloves. Respiratory protection is strongly recommended and care should be taken during decontamination not to disperse droplets.
- Place paper towels along the outside of the spill, working from the edges in. Pour the germicidal solution (10% solution of sodium hypochlorite (household bleach) or Vesphene II se®) around the spill and allow to flow into the spill. To prevent aerosols, avoid pouring the germicidal solution directly onto the spill. Try covering the spill with an absorbent pad and apply the decontaminant to the absorbent pad.
- Allow to stand for 30 minutes, this will provide enough contact time for adequate disinfection.
- Carefully remove the soaked pads, placing them into an autoclave bag. Working toward the center of the spill, use paper towels to wipe up the spill. Discard paper towels as they are used into an autoclave bag.
- Using paper towels soaked in disinfectant, wipe beyond the area of visible or suspected splashing, including the floor and vertical surfaces. Discard paper towels in the autoclave bag.
- Decontamination is complete when the whole area of suspected liquid contamination has been washed with a disinfectant and all excess decontaminant has been mopped up.
- Place all contaminated materials including gloves, shoe covers, and other protective clothing into an autoclavable bag. Sterilize and dispose of this waste in the red bag system as medical waste.

When the above procedure is followed, the spill area is considered to be decontaminated. The BSO and/or the PI will determine whether the entire laboratory area requires gaseous decontamination.

III.K. Biohazard Spill Inside a Biological Safety Cabinet (BSC)

A spill that is confined to the interior of the BSC should present minimal or no risk to personnel in the area. However, chemical disinfectant procedures should be initiated at once while the cabinet ventilation system continues to operate to prevent escape of contaminant from the cabinet.

- Spray or wipe, wall, work surfaces and equipment with a disinfectant. A 10% solution of sodium hypochlorite (household bleach) or Vesphene II se® is recommended. The operator must be properly gloved and gowned during this procedure. Household bleach can penetrate latex gloves and can be corrosive to metal so consider having an alternative available.
- Flood the work surface of the BSC with sufficient disinfectant solution to ensure that the drain pans and catch basins below the work surface contain the disinfectant. Allow the disinfectant to work for 30 minutes before it is cleaned up.
- Be sure to wipe all surfaces including the front intake grill. Drain the disinfectant into a container.
- Repeat above process with distilled water or mild soap and water.

- The disinfectant, gloves, wiping cloth, and sponges should be discarded into an autoclave bag; the material should be autoclaved and discarded in the red bag system as medical waste.
- This process will not disinfect the filters, blower, air ducts, or other interior parts of the cabinet. The BSO should be consulted to determine if gaseous decontamination of these items is necessary.

III.L. Biological Safety Cabinet Malfunction

A failure of a BSC exhausts system is indicated by a red warning light (insufficient flow) and an alarm. When the alarm sounds, laboratory workers should follow these procedures:

- Terminate work.
- Cover and contain all vessels containing infectious agents and contaminated equipment. Turn off all electrical equipment and services, i.e., gas and vacuum.
- If applicable, close the window completely.
- Notify others in laboratory and leave the room.
- Post signs warning others of the malfunction.
- Call the Biosafety Officer X3560.
- Remain available to provide assistance to the Biosafety Officer and support personnel.

III.M. Rotor Failure

If the centrifuge bowl is intact:

- Turn speed control to 0 RPM while letting the vacuum pump continue to run to remove any aerosol generated.
- Leave the room and warn others not to enter.
- Notify the BSO to initiate decontamination procedures.
- Because of the difficulty of safely and easily introducing a disinfectant into the centrifuge chamber, paraformaldehyde decontamination of the entire unit may be required. The BSO will make necessary decontamination arrangements.
- The gaseous decontamination will inactivate aerosolized particles and small droplets; however, grossly contaminated areas must still be treated as a biohazard spill. The rotor or rotor fragments will have to be disinfected with a 10% solution of sodium hypochlorite (household bleach) or Vesphene II se® and autoclaved.
- The vacuum line and pump will also be contaminated. Decontamination may require partial dismantling of the centrifuge and pump. The appropriate centrifuge service person will be consulted for an acceptable procedure.

If the centrifuge bowl is ruptured:

- This is the equivalent of a biohazard spill in the open laboratory. Significant amounts of aerosols will be generated. Personnel should leave the room immediately and warn others not to enter. Contaminated equipment will require treatment with paraformaldehyde.
- The BSO will determine if the entire room requires gaseous decontamination. Until decontamination procedures are completed, no one is to enter the room without proper protective clothing and a full face, HEPA filter respirator.

III.N. Gaseous Decontamination

Decontamination vapor may harm the experimental material or animals. The BSO will advise practical and permissible precautions against vapors. Gross spills cannot be reliably decontaminated in this way.

Complete decontamination of exposed surfaces in an open laboratory or cabinet interior can be accomplished with paraformaldehyde. Gaseous decontamination can be achieved provided that:

- The only possible contamination was by small droplets or aerosol particles.
- Surfaces were clean before any possible contamination and remain clean thereafter so that there is maximum contact of the contaminated surfaces with the paraformaldehyde gas.

III.O. Chemical Emergency Management

- If the chemical spill presents an immediate danger, evacuate all personnel and close the door.
- If spilled material is flammable, turn off ignition and heat sources.
- Attend to any person who may have been contaminated. Remove contaminated clothing carefully, folding the contaminated area inward. Place contaminated clothing in an autoclave bag.
- Thoroughly wash hands and face and any exposed area of the body. Shower, if necessary, emergency shower/eyewash station is located in the corridor of the facility and in Room 622.
- Notify the BSO.
- POST SIGNS WARNING OTHERS NOT TO ENTER CONTAMINATED AREA.
- If an airborne infectious agent is involved, make sure a HEPA filtered respirator is being worn.
- If contamination is aerosolized, leave room and wait one hour to allow materials to settle before commencing clean up.
- Do not touch the spill without suitable protective clothing.
- Never assume gases or vapors do not exist or are harmless because of lack of smell. Review the Material Safety Data Sheet for the chemical to determine its hazard.

Minor Spills

- Inform all personnel about the spill, evacuate if necessary.
- Attend to any person who may have been contaminated.
- Notify the BSO.
- If spilled material is flammable, turn off ignition and heat sources.
- A chemical "spill kit" is located in each laboratory and contains equipment for acid, caustic, and organic spills, along with an instruction booklet.
- Please read the instruction booklet and be familiar with the kit before a spill occurs.

In the event that a worker is contaminated by a chemical, an emergency shower/eyewash station is located in the corridor of the facility.

III.P. Radioactive/Biological Emergency in the Biohazard Facility

III.P.1. Personal Contamination

- Stop work and notify supervisor, BSO, and/or the Environmental Health and Safety Department.
- If an airborne infectious agent is involved, wear a HEPA respirator during clean up.
- If clothing or garment is contaminated remove and place in plastic bag for later handling.

- If body is contaminated wash affected area for at least 15 minutes with mild soap and water and survey with a radiation meter. Use an appropriate disinfectant during cleaning, if necessary.
- Continue to wash until radiation levels are at background levels.
- Call the Radiation Safety Officer (RSO) at x2243 for additional guidance regarding disposal of contaminated materials.
- Contact RSO for guidance regarding autoclaving radioactive waste.

III.P.2. Area Contamination

- Stop work, evacuate the area and notify the supervisor and/or Environmental Health and Safety Department.
- If an airborne infectious agent is involved make sure a HEPA filtered respirator is being worn.
- If contamination is aerosolized, leave room and wait one hour to allow materials to settle before commencing clean up.
- Wear protective clothing (i.e., Tyvek® suit, gloves, respirator, etc.) and evaluate the area with a survey meter, if possible. Some radioactive material cannot be detected by a survey meter, therefore wipe tests should be performed.
- Place absorbent pad over spill area and apply a disinfectant such as 10% solution of sodium hypochlorite (household bleach) or Vesphene II se®. Do not use too much disinfectant so that the amount of radioactive waste is limited.
- Allow disinfectant to stand for 30 minutes, this will provide enough contact time for adequate disinfection.
- Pick up absorbent pad and place it into a plastic bag. If appropriate, survey area with a meter or take wipe tests to determine if area is free of radioactive contamination. Continue to clean area with soap and water until the area is free of contamination.
- Contact the RSO for additional guidance on how to dispose of your contaminated waste. Autoclaving radioactive waste should be avoided, if possible.
- Wash hands, check shoes, clothing and hands for contamination with a survey meter after clean up.

III.Q. Fire and Electrical Failure

III.Q.1. Fire Inside the Containment Facility

- Immediately alert other personnel in the facility to the danger.
- If possible, without endangering yourself, turn off gas burners and laboratory equipment and leave the facility immediately using stairwells or horizontal exits to the Forchheimer Building after notifying other personnel.

DO NOT USE ANY ELEVATORS

- Transmit the alarm. The nearest pull boxes are located outside the facility next to the stairwell at the south end of the building and at the bridge to the Forchheimer Building. Follow up with a phone call to x4111.
- If the fire appears containable, (e.g., waste basket or on a bench top), use the fire extinguishers located throughout the facility. These fire extinguishers may be used on any type of fire. Be familiar with the operation of the extinguisher before you have to use it.

To operate a fire extinguisher:

- Remove the unit from the wall and carry or drag it to the fire area.

- Pull pin.
- Aim nozzle at base of the fire.
- Squeeze handle.
- Sweep nozzle from side to side and gradually progress forward as the flames are extinguished.

Once in a position of reasonable safety, notify the BSO/HAZMAT team concerning any biohazards that have been left exposed. This is the responsibility of all personnel who are in the facility at the time of the fire.

Fire Department or other personnel will wear self-contained breathing apparatus when entrance into the facility is necessary under emergency conditions. Upon resolution of the emergency, the BSO/HAZMAT team shall determine if decontamination procedures are required for Fire Department protective clothing and equipment. Prior to resumption of work in the facility, the BSO shall ensure that all systems of the facility are in proper operation mode.

III.Q.2. Fire in Another Part of the Building

- If an alarm sounds indicating fire in another part of the building, personnel should, if possible, turn off gas burners and laboratory-type equipment.
- Infectious materials should be placed in an incubator, refrigerator, or freezer. Determine the location of the fire by referring to the chart by the alarm box.
- Leave the facility, if required, by the most direct route after notifying other personnel. We encourage evacuation if a fire is reported on the floor you on which you are working or the floor below. You must evacuate when the mandatory evacuation alarm sounds.

DO NOT USE ANY ELEVATORS

III.Q.3. Emergency Evacuation

Building evacuation may be necessary in certain emergency situations. The 4-4-4 alarm sequence will activate only in extreme emergencies indicating that the building must be evacuated immediately by emergency stairwells or horizontal exits.

III.Q.4. Electrical Failure

In the event of power failure in the Biohazard Facility, all electrical power will be lost for 10 to 15 seconds until the emergency generator is activated. At this time, only those lights and receptacles on the emergency electrical power supply, and the Biological Safety Cabinets will be reactivated. The environmental room (653) and area ventilation systems will be reset manually by engineering personnel. Power will be lost to all pieces of equipment not connected to the emergency supply. Once a power failure has occurred, individuals should stop work, decontaminate surfaces, bag or containerize contaminated items, store cultures safely, and in general, "secure" the area and leave. Be sure that all doors are closed when exiting.

III.R. Operational Procedures

- Only supplies and equipment related to the experiment or studies shall be introduced into the facility.
- Supplies, equipment, etc., shall not be removed from the facility unless they have been sterilized or decontaminated under the supervision of the BSO.
- In order to maintain the established, negative airflow pattern within the facility, all doors shall be kept closed.

- Use of hypodermic needles and syringes should be limited to operations or procedures for which there are no alternatives. All sharps should be disposed of in a sharps container. **SHARPS SHOULD NOT BE USED IN HIV LABORATORIES.**
- Safe transportation of infectious materials within the facility requires the use of a secured, labeled non-breakable secondary container.
- All activities involving infectious materials are to be conducted in a BSC. Handling these agents on the open bench is NOT permitted.
- Mouth pipetting is not allowed. Appropriate pipettes and pipetting aids are to be provided by the investigator.
- Work surfaces shall be decontaminated daily and immediately following spills of biohazardous agents with Vesphene II se® or a designated disinfectant followed by rinsing with distilled water.
- In all procedures, care should be taken to minimize the creation of aerosols. Any aerosol-generating procedure must be performed in a BSC.
- All flasks, test tubes, etc., in which biological agents are grown or stored shall be appropriately covered to contain potential spills.
- To protect the house vacuum system, all vacuum lines within the facility must be fitted with an in-line HEPA filter in addition to a secondary liquid disinfectant trap for biological agents.
- Primary suction flasks must contain appropriate liquid disinfectant (i.e., 10% household bleach) before use.
- A separate solvent trap is required to capture chemicals, these chemicals are then properly disposed of under the supervision of the BSO.
- Sinks within this facility are primarily a water source and hand washing station, they are NOT a disposal area. Contaminated liquids are not to be poured into the sinks. All waste including tissue culture media, cultures, buffers, etc., must be autoclaved prior to disposal.
- Because of the communal nature of the facility, all materials have the potential of being a hazard and should be treated with appropriate caution.

III.R.1. Centrifugation Procedures

All centrifugation must be done in capped centrifuge tubes and bottles within sealed centrifuge rotors. All microcentrifuges are to be used within a Biological Safety Cabinet. The following procedure should be followed at all times.

- Review the owner's manual.
- Log in name, speed, time, and rotor in the appropriate log book.
- Before centrifuging, inspect tubes, bottles, and rotors for rough spots, pitting, discoloration, or cracks.
- Particular care should be given to ensuring a proper seal when using high-speed rotors.
- Make sure the proper adapters are in place. Remove and disinfect all adapters at the end of a run.
- Fill and decant all centrifuge tubes and bottles within the Biological Safety Cabinet. Wipe the outside of tubes with disinfectant before placing in rotor.
- Never overfill centrifuge tubes. Leakage invariably occurs when tubes are filled to capacity. For general purpose centrifuges, the maximum capacity should be 3/4 full. Fill ultracentrifuge tubes per manufacturers' specifications.
- Balance centrifuge tubes and bottles carefully and wipe the balance pans with disinfectant after use.
- Never spin uncapped tubes.
- Centrifuge speeds are never to exceed the lower speed rating for the rotor and/or the test tube used.
- Rotors and/or safety buckets must be opened in a biological safety cabinet. Wipe the outside surfaces with disinfectant before removing the rotors from the cabinet.
- Wipe the centrifuge chamber with disinfectant before and after each spin.

- Decontaminate the rotors and/or buckets after use, by wiping it with Vesphene II se®. Rinse thoroughly with distilled water when done, to avoid corrosion.
- Store rotors and accessories in appropriately labeled cabinets and containers.

III.R.2. Environmental Shakers Procedures

- Contents of all vessels must be identified with organism, user, and telephone extension.
- All vessels containing living organisms must be capped. These vessels are to be manipulated in such a manner as to prevent wetting of the plugs or caps.
- Culture flasks or bottles should be held securely in place, to prevent breakage.
- The shaker is to be kept closed when in motion.

III.R.3. Water Bath Procedures

- Water baths must contain an appropriate disinfectant with water being changed at reasonable intervals.
- Water baths are to be covered when used for infectious agents. Appropriate warning signs are to be affixed.
- All vessels containing viable organisms must be closed and properly labeled.
- Avoid using glassware whenever possible.

III.R.4. CO² Incubator Procedures

- Biological organisms are to be listed on the door of the incubator identified with the researcher's name and extension.
- Humidity reservoirs (where necessary) are to be refilled with distilled water.
- Door gaskets are susceptible to mold contamination, therefore, occasionally scrub gaskets with an abrasive cleanser (i.e., BonAmi), rinse with distilled water, and dry thoroughly.
- Virulent fluid cultures and viable biohazardous materials should be incubated in non-breakable vessels. Transportation of cultures from the incubator to the hood shall be in covered, non-breakable, leak-proof pans, trays, or containers large enough to contain cell fluid in case of leakage.
- Petri plates or other inoculated solid media should be transported as above.
- Minimize culture contamination, by disinfecting the incubator with Vesphene II se® and distilled water.

III.R.5. Procedures for Blenders, Homogenizers, Grinders and Sonicators When Working with Infectious Agents

These types of equipment create aerosols when processing materials. When working with hazardous agents, operate and open the equipment in a biological safety cabinet. To reduce the amount of aerosol generated, wait 30 seconds or more after the equipment has been turned off before opening and removing the processed material. Disinfect all equipment when procedures are complete.

III.R.6. Lyophilizers Procedures

The preparation, handling, and use of lyophilized microorganisms presents an unusual hazard since the accidental release of such powders can result in aerosols of high concentration. Cross contamination can readily occur, therefore, handle the powders in a ventilated cabinet. Heavy contamination can also occur at the air exhaust port or manifold outlets of a lyophilizer. Always wear protective equipment when removing materials from the lyophilizer.

III.S. Waste Disposal Procedures

Each authorized user is responsible for the autoclaving of his or her own waste materials, and subsequent removal from the autoclave. Scheduling is arranged among users.

III.S.1. General Procedures

- Solid waste containers are to be clearly labeled "Infectious" and lined with two autoclave bags. Waste materials are placed in the autoclave via the "dirty side" and removed through the "clean side." The user must log in each autoclave use. When autoclaving is complete, the user is responsible for removing the waste from the autoclave and discarding it in the red barrels provided. Our typical recommended autoclaving cycle is 1 hour at 250oC.
- If the autoclave is in use, or malfunctions, return the waste material to the research laboratory. DO NOT leave the untreated waste on the floor of the corridor, or in the autoclave room. Always check the autoclave to make sure the cycle has started properly. Return promptly when the cycle is complete and remove your waste from the autoclave.
- To ensure disinfectant contact with the entire pipette or tip, pipettes and pipette tips are to be placed in containers with sufficient disinfectant. Liquid disinfectants are to be used only for interim decontamination of items. Under no condition does this constitute a final procedure. Sharps disposal containers must contain sufficient appropriate disinfectant.

III.S.2. Liquid Waste

- Whenever possible, liquid waste should be mixed with disinfectant (e.g., 10% household bleach) in the biological safety cabinet.
- After autoclaving or chemical disinfection, liquid wastes may be carefully poured down the sink with the approval of the BSO.
- Never autoclave liquids in non-autoclave containers.
- Never autoclave household bleach or other chemicals.
- Never autoclave radioactive waste.
- Consult the BSO for disposal techniques concerning hybrid waste material (e.g., radioactive/biohazardous waste).

III.S.3. Solid Waste

- Media bottles, culture flasks, culture tubes, and any other vessels that may have come in contact with potentially infectious material must be decontaminated in the biological safety cabinet with sufficient disinfectant before being placed in biohazard bags and autoclaved.
- Contaminated pipettes may be soaked in sufficient disinfectant for at least 30 minutes before autoclaving.
- A disinfectant may be used in sharps containers but note that all sharps containers will be autoclaved before disposal.

III.S.4. Ordinary Waste

- Limit the amount of ordinary trash (e.g., paper, cardboard), brought into the BHF by removing supplies from their outer packaging prior to stocking the laboratory.
- Ordinary trash (paper, wrappers, and cardboard) is placed in the hallway for removal by the Housekeeping Staff within the BHF. All ordinary trash that may be contaminated, shall be autoclaved prior to exiting the facility.

III.T. Facility Operations

The following basic principles underlie the procedures for movement of personnel and equipment when the containment facility is in use:

- Within the BHF, appropriate protective clothing is always worn.
- Protective clothing is to be removed when leaving the containment facility.
- Equipment and material are "autoclave out" except for items unsuitable for autoclaving.
- Alternative methods of decontamination are determined by the BSO.

III.T.1. Admission to the Facility

- Authorized user form must be completed.
- Worker must meet with the BSO.
- Persons falling under any medical restrictions must satisfy the appropriate requirements.

III.T.2. Personnel Access and Egress

III.T.2(a) Regulations for Access Corridor

- Disposable lab wear is to be changed weekly or as needed.
- Shoe covers and head covers should be used when necessary.
- When required by the BSO, maintenance personnel are to use disposable Tyvek® suits over street clothes. These suits are placed in a biohazard bag when exiting the facility for appropriate autoclaving and disposal.

III.T.2(b) Personnel Entering

- Enter airlock.
- Store personal items in assigned lockers, if available.
- Non-disposable cloth lab coats, as well as other laboratory attire, must not enter the BHF, lab coats may be hung on hooks, provided in the interlocks.
- Proceed to your work area in street clothing.
- Don personal protective equipment which may typically consist of: disposable lab coat or Tyvek® suit, shoe covers, head covers, and double latex gloves.

III.T.2(c) Personnel Exiting

- Remove outer pair of gloves when work is completed in biosafety cabinet.
- Remove disposable lab coat or Tyvek® suit, place it in infectious waste container or hang it on a coat hook in the facility laboratory.
- Remove second pair of gloves.
- Wash hands thoroughly before exiting.
- Proceed to the corridor in street clothing and exit facility.
- NO LABORATORY ATTIRE IS TO EXIT THE BHF.

III.T.2(d) Emergency Exit

In an emergency, if the situation is significantly dangerous, personnel in the laboratories may leave via the access corridor without changing clothes.

III.T.3. Access Procedures for Engineering and Other Support Staff

Maintenance including routine servicing, repair, and support services will be administered by the BSO. When the laboratory is in use, the laboratory staff will undertake certain items of routine servicing and support. This procedure will minimize the necessity for others to enter a potentially contaminated area. If repairs or replacements in potentially contaminated area are not within the competence of the laboratory staff, conditions for entry of the maintenance staff and requirements for decontamination will be defined by the BSO.

- The BSO must be notified at x3560 prior to entry into the BHF.
- The BSO will approve all entry into the BHF, persons who comply with all entry and exit procedures will be permitted access to BSL 2 and 3 laboratories or animal rooms.
- All workers will be accompanied by a BSO and be provided with suitable protective clothing (e.g., disposable lab coat or Tyvek® suit, shoe covers, head covers, gloves, face mask, etc. as needed). The BSO will determine the appropriate personal protective equipment for each job.
- If entry is required into a BSL 2 or BSL 3 lab, all infectious work will be suspended and the area will be declared safe prior to entry.
- Work will be performed under the supervision of the BSO.
- Upon exiting the lab, protective clothing will be removed and disposed of in the internal change room or corridor.
- Hands will be washed thoroughly before exiting the laboratory.
- All potentially contaminated tools will be decontaminated by the BSO before exiting the lab.

Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in the BHF. Persons who must wear contact lenses in laboratories should also wear goggles or a face shield.

Persons who have immune dysfunction maybe at risk of acquiring infections. Persons who are at increased risk of acquiring infection or for whom infection may be unusually hazardous are not permitted in the BHF laboratories or animal rooms.

III.U. Access Procedures for Equipment and Materials

III.U.1. General

Procedures are basically the same for laboratory equipment (i.e., instruments, glassware), and materials (i.e., media, cultures), all of which are referred to here as "materials" unless there is a special distinction.

Material Inbound

The general rule is that no processing is required for inbound materials. Such materials may be introduced via the pathway used by inbound personnel. Special care should be taken when transporting infectious or hazardous materials into the facility. Overpacking the hazardous material with the addition of an absorbent is recommended when transporting infectious or hazardous materials.

III.U.2. Material Outbound

III.U.2(a) From Laboratories

All materials exiting from the BHF must be either in a closed, plastic autoclave bag, closed buckets or containers. Disposable items and trash can be placed in double autoclave plastic bags.

All materials leaving the laboratories are then taken directly to the autoclave for decontamination. Do not leave materials around the laboratory for clean up the following day.

III.U.2(b) From the Containment Facility

All materials leaving the Containment Facility must be appropriately disinfected either by surface decontamination, steam sterilization or formaldehyde decontamination. Large objects may be surface decontaminated within the laboratory. Removal through the air lock is then possible. Equipment such as microscopes, water baths, incubators, microcentrifuges, etc., may require formaldehyde decontamination. This can be arranged with the BSO.

III.U.3. Laboratory Staff

The laboratory staff is to perform routine laboratory housekeeping, such as autoclaving of lab waste, cleaning of the autoclave chamber, cleaning of laboratory equipment, and other such actions which constitute good laboratory practices.

III.U.4. Support Services

The BSO shall arrange for any necessary support services. These services include service and repair of equipment. Repair of equipment not under service contract will be made by:

- BSL-2 and 3 personnel
- Einstein staff
- Outside repair personnel
- All major equipment malfunctions must be reported to the BSO.

Testing and certification of the general air HEPA filtration systems is performed annually. Testing and certification of the Class II and III Biological Safety Cabinets within the facility, is to be performed semi-annually or whenever a cabinet is removed. All major services and repairs must be coordinated through the BSO. Investigators are responsible for paying the cost of their cabinet certification.

III.V. Laboratory Regulations

All safety and operating procedures applied within each laboratory fall under the direct responsibility of the investigator and must be in agreement with the general defined policies of this Manual.

Proper recording and control of equipment and safety operations of the entire BHF are done via a series of sign-up sheets. Records are kept for:

- All centrifuges in Rooms 622, 623, 624, and 625 (records are kept on top of equipment).
- Registration of outside persons authorized to enter the BHF (kept with the BSO).
- Certification and testing reports on airflow, HEPA filters, sterilizers, safety cabinets (kept with the BSO).
- Pass-through autoclave, users, sterilization checks, temperature chart records (kept with the BSO).

III.V.1. Regulations for Autoclave Use

- The pass-through autoclave is for decontamination purposes only.
- Everyone assigned to the BHF must know the operating procedures of the autoclaves. These procedures are posted on the loading side of the autoclave.

- All autoclavable material shall leave the laboratory in covered, sealed, and marked containers.
- Appropriate materials leaving the BHF, whether to be reused or disposed of, must go through an autoclave decontamination cycle.
- Personnel using the autoclave are to complete a sign-up sheet, providing name, laboratory, and extension before operating the autoclave.
- The contact of steam with the infectious agent is essential for any decontamination procedure to work properly.

III.V.2. Autoclave Procedures

- The screen in the autoclave drain line at the base of the autoclave is to be removed and cleaned before each use.
- At all times, materials must be placed directly into the autoclave and not left outside the autoclave.
- Shallow autoclave pans are available for liquid waste containers and reusable items. Separate pans for each are recommended.
- Uncover or loosen all tightly closed pans, bottles, and containers when autoclaving.
- Double autoclave biohazard waste bags containing waste are to be securely closed individually, before leaving the laboratory to be autoclaved.
- Sharps containers are to be covered, placed in double biohazard bags, and autoclaved as indicated for solid waste.
- After placing a barrel in the autoclave, remove top to allow steam penetration. The top can also be autoclaved at the same time.
- Barrels are to be relined with double autoclave bags before being returned to lab.
- Liquid disinfectants are to be used only for interim soaking of items, before autoclaving. Under no condition does this constitute a final procedure.
- The BSO will periodically check the efficiency of the autoclave by testing it with a biological indicator.
- It is the responsibility of the laboratory personnel or investigator using the autoclave to, load his/her own material, remove it upon completion, and place the autoclaved waste in the red biohazard containers for removal by the custodial staff.

III.W. Laboratory Hygiene

Housekeeping is to be done daily by those authorized users assigned to the laboratories. Specific scheduling is to be established by the authorized laboratory personnel.

III.W.1. Room Cleanliness

Each investigator and authorized user is responsible for his assigned area. Each laboratory must be kept neat and clean. To help facilitate this, only limited amounts of material needed may be introduced into the facility. No cartons are permitted. Cleanliness and care within common spaces should be observed by everyone.

III.W.2. Biological Safety Cabinet Cleanliness

Particular attention to cleanliness and tidiness is necessary within the BSC, to permit convenient and uncontaminated laboratory manipulations. Equipment and materials should be limited to essential and current needs. Interior surfaces must be wiped down with Vesphene II se® or other disinfectant before and after using the cabinet. Attention to interior and exterior of the windows, is necessary to maximize visibility of manipulations.

III.W.3. Tidiness

To prevent spills and to permit frequent cleaning, a minimum number of items should be kept on working surfaces.

III.W.4. Pest Control

An important part of housekeeping in biohazard containment is control of insects. The BSO will coordinate the establishment of this program.

III.X. Protocol for Custodial Staff

Admittance of the custodial staff into the BHF laboratories are arranged with individual laboratories.

- Authorized custodial personnel shall carry out duties in laboratory rooms before research activities have begun, and/or after research activities have ceased.
- Appropriate protective clothing (i.e., laboratory coat and disposable gloves) will be provided and will only be worn in the BHF laboratory.
- The custodial staff shall be responsible for floor, wall care and keeping the environment of the facility as dust-free as possible. All dusting will be achieved with a germicide-soaked cloth. This includes removing dust from the higher reaches of the lab, i.e., on tops of conduits, window ledges, etc.
- Only use treated dry-dust mop heads to suppress the aerosolization while cleaning.
- Sanimaster Phenolic, a detergent decontamination solution, will be used to wet mop floors and walls.
- Used wet mop heads are to be replaced as needed and are to be autoclaved before discarding. When autoclaving, the autoclave bag should not be tied to allow the steam to penetrate.
- Other responsibilities include filling paper towel dispensers, iodoform soap dispensers, washing all door handles with germicidal solutions, and washing the corridor floors with Sanimaster Phenolic.
- None of the custodial equipment is to be left in the corridor, all supplies should be returned to the closet.
- Thorough floor cleaning, i.e., scrubbing and stripping is to be done as needed. Scheduling is to be coordinated with the BSO.

III.Y. Laboratory Storage

Laboratory storage capacity is limited, therefore, only a limited amount of material needed may be introduced into the facility. No cartons are permitted to be stored on the floor.

All infectious materials requiring BSL-2 or 3 containment must be stored in closed, sealed containers, and their contents and location identified appropriately by biohazard sign and the name of the researcher, department, room, and extension.

III.Y.1. Environmental Room/Cold Room

- Space will be assigned by the BSO to the researcher.
- It is expected that each researcher will remove materials and decontaminate the area promptly upon the completion of the project within the facility.

III.Y.2. Freezer and Refrigerator Space

To be assigned by the BSO.

- Prompt removal and proper disposal of materials is expected upon completion of experimental protocols and projects.
- Investigators should not expect to be able to use storage space longer than 6 months after completion of their project.
- Careful storage of biological materials is essential. Storage of minimum amounts of materials is expected.
- Flammables are not permitted to be stored in non-explosion proof refrigerators or freezers.

III.Y.3. Chemical Storage

- No more than five gallons of flammable liquids per laboratory is allowed.
- Acids must be stored separately from solvents.
- Store large bottles as close to the floor as possible, but NO chemicals may be stored on the floors or in the aisles.
- Storage is not permitted in corridors.
- Isotopes must not be stored in the BSL-2 or 3 facility.

III.Z. Disinfectant Solutions

For surface decontamination (one of the following may be used):

- Vesphene II se®
- Wescodyne, 2% final concentration
- Clorox, (household bleach), 10% final concentration

For liquid wastes containing viruses, virus-infected or transformed cells:

- Vesphene II se®
- Wescodyne, 2% final concentration
- Clorox, (household bleach), 10% final concentration

Pipette decontamination:

- Clorox, (household bleach), 10% final concentration
- Decontamination of overt spills of biohazardous material:
- Vesphene II se®
- Clorox, (household bleach), 10% final concentration

Floors:

- Sanimaster Phenolic Cleaning Detergent

III.AA. Authorized User

Requirements for BHF personnel:

- Complete medical requirements.
- Study the Einstein's Biohazard Facility Safety and Operations Manual (this Manual) and other guidelines where applicable.
- Receive training in the use of the facility's containment equipment and proper techniques.

- Demonstrate familiarity with facility procedures.
- Sign the statement below.
- Review the Containment Facility's Safety and Operations Manual semiannually and re-initial this statement.
- Receive appropriate keys and locker assignment from BSO.

III.BB. Containment Facility Keys

I understand that the Containment Facility keys issued to me are:

- My responsibility
- Not, under any circumstances, to be shared, distributed, given on loan and/or reproduced.
- To be returned to the Biosafety Officer when no longer needed by me.
- If any Containment Facility keys issued to me are lost, I will notify the Biosafety Officer immediately.
- I have read and understand the information contained in the Einstein Biohazard Facility Safety and Operations Manual.

I understand my responsibilities as an authorized user of the Facility.

_____	_____
User Signature	Date
_____	_____
Biosafety Officer	Date
_____	_____
Principal Investigator or Designee	Date

IV. Definitions

The term "containment" is used in describing safe methods for managing infectious agents in the laboratory environment where they are being handled or maintained.

V. Effective Date

Effective as of: 12 November 2018

VI. Procedure Management and Responsibilities

Einstein's Department of Environmental Health and Safety is the Responsible Office under this Manual. Einstein's Associate Dean for Finance and Administration is the Responsible Executive. Einstein's Senior Director of Environmental Health and Safety is the Responsible Officer for the management of this Manual.

Appendix A: Autoclave (Room 675 Chanin Building) - Biohazard Facility

Operating Instructions for Autoclave (Steam Cycle)

1. Complete sign-up sheet.
2. Remove debris from chamber as needed (check strainer-clean before each use). This step is critical. If strainer is clogged, the steam cannot be exhausted from the autoclave.
3. Master power switch - "ON."
4. Check that clean side door is locked.
5. Check jacket pressure gauge; it should read 15 to 20 pounds.
6. Liquid cycle button should be depressed (Open door and clean strainer located on the bottom surface of the autoclave).
7. Place contaminated materials in chamber.
8. Check timer-60 minutes.
9. Lock door recheck jacket pressure.
10. Press "cycle start" button (sterilizer then goes through sequence automatically, buzzer will sound on clean side when cycle is complete)
11. Open clean side door and remove material.
12. Lock clean side door.
13. Open contaminated side door to relieve gasket pressure.
14. Close contaminated side door.

AUTOCLAVE IS NOW READY FOR ANOTHER CYCLE.

DO NOT USE DRY CYCLE.

DO NOT PRESS THE "CYCLE OFF" BUTTON.

DO NOT LEAVE DOOR ON CONTAMINATED SIDE LOCKED WHEN NOT IN USE.

ANY QUESTIONS OR PROBLEMS, CALL X3560

Appendix B: Generic Disinfectant Chart

Assessment of Generic Disinfectants on Basis of Efficacy

Disinfectant	Cidal Activity Indicated				
Class	Bacteri-	Tuberculo-	Pseudomona-	Sport-	Viru-
Acids/alkalies	good	good	good	good	good
Alcohols	good	good	good	none	moderate
Chlorines	good	good	good	moderate	good
Formaldehyde	good	good	good	good	good
Glutaraldehyde	good	good	good	good	good
Iodines	good	good	good	moderate	good
Mercurials	fair	none	fair	none	good
Phenolics	good	good	good	poor	moderate
Quaternaries	good	none	fair	none	moderate