



Safe Operating Procedure

(Revised 2/20)

HIV AND HBV RESEARCH LABORATORIES

Introduction

This SOP supplements the general requirements of UNL's Bloodborne Pathogen Exposure Control Plan (UNL ECP) and the OSHA Bloodborne Pathogen Standard (29 CFR 1910.1030). This SOP applies to research laboratories, defined as a laboratory producing or using research-laboratory-scale amounts of HIV or HBV, generally in concentrated form.

This SOP does not apply to clinical, diagnostic, or research laboratories using human blood (or blood components), tissues, or organs but not producing or using concentrated amounts of HIV or HBV. However, UNL's ECP requirements do apply to such laboratories.

Project Approval

- All affected faculty and staff must adhere to all requirements of the UNL ECP as well as this SOP. The ECP requires participation in annual bloodborne pathogens training, pre-exposure immunization, and post-exposure follow-up, among other requirements.
- All research and laboratory work covered under the Bloodborne Pathogens Standard is subject to protocol review and approval by the UNL Institutional Biosafety Committee (IBC).

Training

As required by the UNL Biosafety Guidelines and OSHA Bloodborne Pathogens Standard, the Principle Investigator (PI) must develop a biosafety manual, review it at least annually, and update it as necessary. Refer to the EHS SOP, ***Preparing a Laboratory Biosafety Manual*** for additional information.

- In addition to general bloodborne pathogen training required under UNL's ECP, laboratory workers are required to:
 - Read, understand, and adhere to the biosafety manual;
 - Demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the laboratory before being allowed to work with HIV or HBV;
 - Have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV;



The Principal Investigator or his/her designee **shall** provide training to workers with no prior experience in handling human pathogens and not allow work with infectious agents until proficiency has been demonstrated.

Practices and Procedures

- Entry and exit procedures and restrictions, as described in the biosafety manual, must be observed.
- Procedures addressing accidental occupational exposure to bloodborne pathogens are described in the EHS SOP, ***On-The-Job and Student Injuries***. The EHS form/document titled **Exposure Care Kit** (available on the EHS web site, under the “resources” tab, as a form) is also a useful resource. If nose, eyes, mucous membranes, or broken skin is exposed to potentially infectious material, flush these areas with water continuously for 15 minutes and seek immediate medical attention. Spills or accidents that result in potential exposure to bloodborne pathogens must be reported immediately to the PI and EHS. If the work also involves recombinant nucleic acids, EHS may be required to file an incident report with the National Institutes of Health (NIH).
- Hypodermic needles, syringes, and other sharp instruments may be used only when a safer alternate is not feasible. Only needle-locking syringes or disposable syringes with needle units that have a needle as an integral part of the syringe may be used for the injection or aspiration of potentially infectious material. Extreme caution must be used when handling needles and syringes in order to avoid self-inoculation and the generation of aerosols during use and disposal. A needle may not be bent, sheared, replaced in the sheath or guard, or removed from the syringe after use. The needle and syringe must be promptly placed in a rigid, leak proof, puncture-resistant container and decontaminated, preferably by autoclaving, before being discarded or reused. The puncture-resistant container must be located as close to the work site as possible to minimize distances that unprotected syringes and needles must be transported. See the EHS SOP, ***Sharps – Handling and Disposing***.
- Spills must immediately be contained and cleaned up by staff that are trained and equipped to work with potentially infectious material. See EHS SOP, ***Cleaning up Spills of Bloodborne Pathogens***.

Personal Protective Equipment

- Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing must be used in the work area. Protective clothing may not be worn outside of the work area. See the EHS SOP, ***Handling Laundry Potentially Contaminated with Bloodborne Pathogens***.

- The appropriate combination of protective eyewear (goggles), mask, and/or a face shield must be worn when there is potential for a splash of potentially infectious material. Safety glasses are not appropriate eye protection to protect against liquid splashes and aerosols.
- Protective gloves must be used when handling potentially infectious materials. Disposable gloves must not be washed or decontaminated for re-use; must be changed when known to be contaminated; and must be removed before leaving the laboratory. Hands must be washed thoroughly with soap and water after removing gloves and before leaving the laboratory.

Facilities and Containment Equipment

- Access to HIV and HBV laboratories must be restricted to authorized individuals, appropriately trained. The PI is responsible for determining who is authorized and properly trained.
- Laboratory doors must be posted with the universal biohazard symbol, the name of the agent manipulated, and other appropriate warning signs. The door will be kept closed when work with HIV or HBV is in progress.
- Autoclave(s) used for BBP decontamination should be enrolled in the EHS-administered autoclave performance-testing program, and tested at the applicable interval. See EHS SOPs ***Autoclave Operation and Use*** and ***Autoclave Performance Testing*** for additional guidance.
- All aerosol-generating and open-container activities of potentially infectious materials must be conducted with appropriate containment (e.g., in a biological safety cabinet or other physical containment devices within a containment module). Such work must not be conducted on the open bench. If use of a biological safety cabinet is not feasible, the IBC may approve other appropriate control(s) (i.e., PPE, respirators, centrifuge safety cups, sealed centrifuge rotors, containment caging for animals, etc.).
- Biological safety cabinets must be certified when installed, at least annually thereafter while in use, when they are relocated, or there is reasonable cause to have them tested. Have your Building Maintenance Report call the UNL Facilities Service Desk at 472-1550 or email at servicedesk@unl.edu to request services.
- Each laboratory shall contain a facility for hand-washing and an emergency eyewash facility, readily available within the work area.
- Vacuum lines must be protected with high-efficiency particulate air (HEPA) filters **and** liquid disinfectant traps. Filters must be checked routinely and maintained or replaced as necessary. (Figure 1) Disinfectant traps should be emptied with 75% full. Prior to disposal, more disinfectant should be added to the container to ensure proper disinfection.

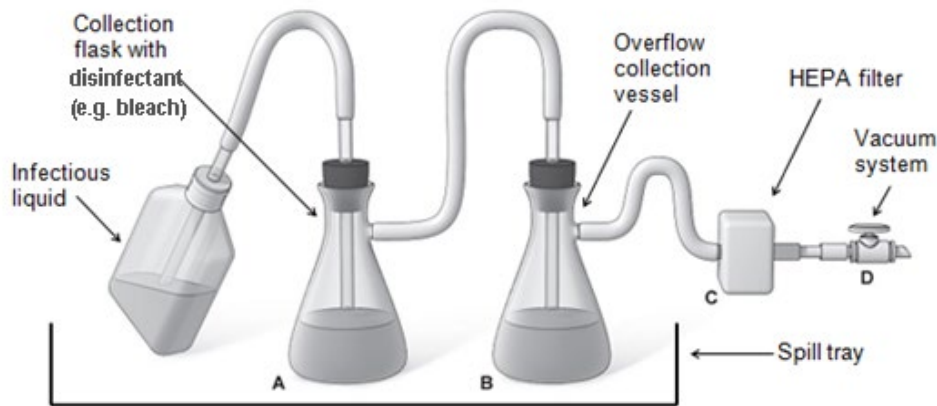


Figure 1 Liquid aspiration setup.

Note: A spill tray and overflow collection vessel are optional components.

Waste Disposal

- All regulated waste must be autoclaved or decontaminated by another IBC-approved method prior to disposal.
- Under the OSHA Bloodborne Pathogens Standard, *regulated waste* is defined as any of the following:
 - liquid or semi-liquid blood or other potentially infectious materials;
 - contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed;
 - items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling;
 - contaminated sharps; or
 - pathological and microbiological wastes containing blood or other potentially infectious materials.
- Contaminated materials that are to be decontaminated at a site away from the work area must be placed in durable, leak proof containers that are labeled (biohazard symbol) or colored red, and that are sealed before being removed from the work area.
- Waste rendered non-infectious by autoclaving should have a clearly visible indication of treatment (i.e., autoclave tape that turns colors upon autoclaving).