



Kennesaw State University (KSU) is committed to providing and maintaining a safe teaching, learning, living, and working environment for all members of its community. Universities have unique work environments that entail a variety of operations and activities that involve working with hazardous materials. Some personnel, therefore, are at risk of exposure to various types of hazards, including chemical, biological, physical, and radiological. However, with prudent practices, engineering controls, appropriate personal protective equipment (PPE), proper facilities and awareness, all operations can be handled safely without undue risk to KSU employees, students, properties, or the environment.

The responsibility of ensuring a safe work environment at KSU is a shared responsibility between administrators, employees, and Environmental, Health, and Safety (EHS) personnel. Nevertheless, supervisors, principal investigators (PIs), and managers have the primary responsibility for safety in work areas under their supervision, and for ensuring compliance with the applicable health, safety and environmental regulations and policies in these areas.

The KSU Exposure Control Plan (ECP) is established in accordance with the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard ([29 CFR 1910.1030](#)), and the best practices outlined by the Center for Disease Control's (CDC) [Biosafety in Medical and Biomedical Laboratories, 6th Edition](#) (BMBL) and is provided to all faculty, staff, employees, and students in an effort to eliminate or minimize the potential for exposure to bloodborne pathogens (BBPs) in the working and/or learning environment. This ECP includes the following elements:

- Employee exposure determination
- Exposure control methods
- Universal precautions
- Engineering controls
- Work practice controls
- PPE
- Housekeeping
- Vaccination recommendations (e.g., Hepatitis B)
- Post-exposure evaluation and follow-up
- Training
- Recordkeeping
- Incident reporting

The PIs, laboratory managers, and supervisors must supplement the ECP with task-specific training and guidance regarding specific practices and procedures unique to the work being done, specifically where potential for exposure to BBPs exists. This program will be reviewed at least annually, and whenever it is deemed necessary based on changes in procedures and practices that directly affect employee exposure.

Contact Information

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Ventilation (HVAC) problems, fume hood exhaust issues, and laboratory safety design	Plant Operations/HVAC Shop Tel: (470) 578-6224
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*For the most current contact information, access the EHS website at ehs.kennesaw.edu.

1. Scope and Application

A. Purpose

The purpose of the ECP is to outline the regulatory requirements and effective control measures to minimize potential for exposure to BBPs.

B. Scope

The ECP applies to activities in all facilities owned, leased, or operated by KSU, where KSU employees have the potential to be exposed to BBPs while performing their work duties. It applies to all KSU employees and students who have the potential to be exposed to human blood, human bodily fluids, or [other potentially infectious materials \(OPIM\)](#) while performing their work duties, as outline in the exposure determination below. Included are anticipated tasks and/or procedures by which occupational exposure may occur for these individuals.

C. Employee Exposure Determination

The following KSU job classifications are covered under this ECP based on their potential for exposure to human blood, human blood components, BBPs, or OPIMs. OPIM refers to other human bodily fluids including but not limited to cerebrospinal fluid, vaginal secretions, semen, and pleural fluid, etc.

Job Title	Department (s)	Task/Procedure
Principal Investigators/Faculty	Molecular and Cellular Biology Chemistry and Biochemistry Ecology, Evolution, Behavior, & Organismal Biology Psychology Anthropology	Experiments involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.
Principal Investigator/Faculty	WellStar School of Nursing	Experiments involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.; collection and manipulation of blood samples and other human bodily fluids.
Principal Investigator/Faculty	Exercise Science and Sports Management	Experiments involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.; collection and manipulation of blood samples and other human bodily fluids.
Laboratory Coordinators	Molecular and Cellular Biology Chemistry and Biochemistry Ecology, Evolution, Behavior, & Organismal Biology Psychology Anthropology	Preparation of experiments involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.

Laboratory Personnel (managers, technicians, graduate students, TAs, etc.)	Molecular and Cellular Biology Chemistry and Biochemistry Ecology, Evolution, Behavior, & Organismal Biology Psychology Anthropology	Preparation of experiments, conducting experiments involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.
Registered Nurses	WellStar School of Nursing	Work duties involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.; collection and manipulation of blood samples and other human bodily fluids.
Laboratory Personnel (managers, technicians, clinical students, TAs, etc.)	Nursing	Work duties involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.; collection and manipulation of blood samples and other human bodily fluids.
Laboratory Personnel (managers, technicians, graduate students, TAs, etc.)	Exercise and Sports Management	Work duties involving materials of human origin, including blood, bodily fluids, cells, tissues, DNA, BBPs, etc.; collection and manipulation of blood samples and other human bodily fluids.
Registered Nurses	Continuing Education (Phlebotomy Program, Healthcare Assistance Program)	Work duties involving collection and manipulation of blood samples and/or other human blood components.
Laboratory Personnel (instructors, technicians, etc.)	Continuing Education (Phlebotomy Program, Healthcare Assistance Program)	Work duties involving collection and manipulation of blood samples and/or other human blood components.
Biosafety Compliance Officer	Department of EHS	Biohazard spill response, surface decontamination, laboratory inspections, etc.
Biosafety Compliance Officer, Sr. Hazardous Materials Specialist; Chemical and Hazardous Materials Technician	Department of EHS	Handling, storage, and disposal of biological and/or biomedical waste.
Fire and Life Safety Manager	Department of EHS	Administering or assisting with administration of first aid.
KSU Police	Department of Public Safety	Administering or assisting with administration of first aid.

Athletic Trainers	Athletics NCAA Sports and Recreation Intramural Sports	Assisting with or administering first aid, and/or treatment of athletic injuries.
Custodial Staff	Building Services	Cleaning of laboratory, clinical, or residential areas where human blood or OPIM may be found.
Plumbing Staff	Department of Plant Operations	Repairs of pipes, exposure to wastewater or sewage.

D. Exemption

This program does not apply to ***the following group of individuals who work at KSU as part of the WellStar Health System. Such employees are covered under the WellStar's BPPs program.***

Job Title	Department	Location
Physicians, Nurse Practitioners	WellStar Student Health Services	Kennesaw and Marietta Campus
Clinical Nursing Staff- RN, LPNs, and CMAs	WellStar Student Health Services	Kennesaw and Marietta Campus

2. Roles and Responsibilities

A. The University

KSU has an obligation to provide a workplace for its employees that is reasonably safe from all recognized hazards associated with their job duties, including biological hazards that could cause illness in exposed individuals. Therefore, KSU has instituted the ECP for all personnel who may be exposed to BBPs during the performance of their duties. Under the ECP, the university has the following responsibilities:

- Ensure appropriate training is provided to personnel who have the potential to be exposed to BBPs while performing their job duties.
- Provide appropriate PPE for employees.
- Make the necessary vaccinations (e.g., the Hepatitis B vaccine) available to all employees subject to the ECP at no cost.
- Obtain a declination form from all individuals who choose not to be vaccinated for Hepatitis B.
- Establish and implement policies for safe conduct during research activities involving work with materials of human origin and BBPs.
- Provide adequately designed facilities and containment devices for working with BBPs and other biological materials.
- Establish and maintain a health surveillance program for personnel.
- Report any significant problems, violations, or significant research-related accidents or illnesses to the National Institutes of Health (NIH) Office of Biotechnology Activities (OBA) as required.

B. Deans

Under the ECP, Deans have the following responsibilities:

- Create vision, enforcing policies, setting performance expectations, and ensuring timely availability of resources that support the ECP.
- Provide leadership to ensure effective implementation of the ECP and ensure compliance with governing laws, regulations, and policies. To this end, Deans may designate a safety officer(s) within their college/school.
- Review laboratory and safety-related assessment reports as a means to assess and direct corrective actions necessary to continually improve safety within their college/school.

C. Department/School Chairpersons

Under the ECP, department and school Chairpersons have the following responsibilities:

- Set performance expectations, manage biosafety risks, and ensure their department's compliance with this program and other Environmental and Occupational Safety (EOS) governing laws, regulations, and policies.
- Implement KSU's ECP and its requirements within their respective units and laboratories.
- Incorporate the ECP requirements and responsibilities into employee job descriptions and address performance based on compliance with these requirements.
- Ensure that individuals under their supervision, including but not limited to supervisors, managers, regular and temporary employees, contractors, and other affected personnel, obtain required BBP training.
- Ensure prompt reporting and appropriate investigations of incidents/accidents within the unit, in accordance with the University's Incident Reporting and Investigation requirements ([EOSMS-108](#)).
- Ensure the development and implementation of processes for conducting hazard/risk assessments within their respective units or laboratories inclusive of periodic safety inspections of work areas and/or facilities and ensure non-compliance items are corrected with follow-up and closure.
- Ensure an assessment of the EOS impact of BBPs, processes and equipment, and incorporate appropriate controls.

D. Environmental, Health, and Safety/Biosafety Officer

The responsibilities of EHS and the BSO include, but are not limited to, the following:

- Develop, implement, and maintain the university's ECP.
- Develop protocols and procedures to address exposure concerns.
- Provide training in the safe use and practices for those working with BBPs, materials of human origin, and OPIM.
- Provide technical advice to PIs, supervisors, the Institutional Animal Care and Use Committee (IACUC), and Institutional Biosafety Committee (IBC) on research safety procedures.
- Conduct hazard assessments for existing and new protocols involving experiments using human blood, human bodily fluids, BBPs, or OPIMs.
- Consult with researchers on issues of biosafety, biosecurity, and the safe use of biological materials in the laboratory.

- Ensure biosafety containment devices are functioning properly and certified annually.
- Perform periodic inspections to ensure that standard operating procedures are being followed and regulatory requirements are being met.
- Provide guidance to researchers on proper waste disposal methods in accordance with federal and state regulations.
- Assist in the development of emergency plans for handling accidental spills and personnel contamination.
- Investigate accidents involving BBPs, materials of human origin, and OPIM.

E. Institutional Biosafety Committee (IBC)

Under the KSU ECP, the responsibilities of the IBC are as follows:

- Provide guidance and support in the development of policies and procedures established for activities involving BBPs, materials of human origin, and OPIM.
- Ensure that all policies, practices, and facilities meet regulatory, state, and University requirements.
- Review research protocols involving BBPs, materials of human origin, and OPIM.
- Approve or disapprove proposals based on risk assessment and review of research proposals.

F. Principal Investigators

PIs are responsible for conducting diagnostic and/or research activities in a manner which minimizes the risk of exposure to BBPs in the laboratory environment. PIs have the responsibility to:

- Obtain the required approval from the IBC for new research proposals as well as amend existing proposals (i.e. – addition of new agents, animals, etc.) for work with BBPs, materials of human origin, and OPIM.
- Complete and document risk assessments conducted for the purpose of determining level of risk and/or lowering the level of risk.
- Ensure that laboratory employees and support personnel who will work with these materials meet the following criteria prior to working in the laboratory:
 - Properly trained and show proficiency in standard microbiological practices at the appropriate biosafety level(s).
 - Aware of biohazards and precautions to be taken in conducting research activities.
 - Advised of the nature of recognized and potential hazards.
 - Informed of the indicators of accidental infections.
- Establish standard operating procedures (SOPs) for laboratory work.
- In collaboration with the BSO, ensure that the appropriate immunizations, serologic monitoring, post exposure prophylaxis, and other medical monitoring are provided to personnel.
- In collaboration with EHS and the BSO, develop procedures for dealing with accidental spills and accidental exposures among personnel.
- Report to the BSO and/or EHS issues pertaining to:
 - All accidents/incidents within the laboratory that may pose a risk.
 - Exposure of personnel to BBPs, materials of human origin, and OPIM.
 - Compromised biological or physical barriers.
 - Major equipment failures which could compromise safe operations in the laboratory.

- In conjunction with the BSO, correct procedures which may result in hazardous incidents or employee exposures.

G. Laboratory Managers/ Supervisors/Coordinators (LMs/LSs/LCs)

Laboratory managers (LMs), laboratory supervisors (LSs), and laboratory coordinators (LCs) must supervise the day-to-day operations in the laboratory. LM, LS, and LC responsibilities include:

- Oversee the activities of laboratory workers engaged in research involving BBPs, materials of human origin, and OPIM.
- In collaboration with the PI and BSO, ensure all staff complete BBP training annually.
- Ensure laboratory personnel demonstrate proficiency in standard and special microbiological practices before beginning work.
- Ensure all staff have been trained on the SOPs in the laboratory.
- In conjunction with the BSO, ensure physical containment systems, support equipment, waste disposal, and operation meet the safety guidelines.
- Perform regular checks and assessments of containment devices, equipment, and PPE.
- Notify the BSO or EHS of any incident or problem that compromises the safety of the staff or the integrity of the laboratory.

H. Department Managers/Supervisors

Department managers and department supervisors must supervise the day-to-day activities of the work area. Their responsibilities are as follows:

- Oversee the activities of employees and students engaged in activities where exposure to materials of human origin and OPIM is possible.
- Ensure all staff are properly trained for their assigned tasks.
- Ensure all operations meet the safety guidelines.
- Perform regular checks and assessments of containment devices, equipment, and PPE.
- Notify the BSO or EHS of any incidents or issues that compromise the safety of the staff or the work area.

I. Employees

All KSU employees have a right to be protected against potential exposure to workplace hazards but also have a shared responsibility for ensuring their own safety while performing their job duties.

Responsibilities for all employees under this ECP are as follows:

- Complete BBP training, departmental training, and any other job specific training offered for a specific work area.
- Conduct all activities in accordance with the university's policies, procedures, and guidelines, including the requirements in this ECP.
- Complete training on the SOPs, potential hazards associated with their work, and emergency procedures.
- Employ good housekeeping and regular disinfection practices to help maintain a safe work area.
- Complete all medical surveillance requirements.
- Report any medical restrictions, reportable illnesses, and any event that may be the result of an exposure to the PI, LM, or LS.
- Report irregular workplace conditions or accidents to the PI and EHS immediately.

3. Methods of Implementation and Control

A. Universal/Standard Precautions

All personnel who have the potential to be exposed to BBPs must observe universal/standard precautions. Under these precautions, all human blood, tissues, cells, cell lines, DNA, and OPIM must be treated as if they are known to contain BBPs (e.g., HIV, HBV, HCV, etc.). Therefore, the appropriate administrative controls, engineering controls, work practices, and PPE should be used to eliminate or minimize potential exposure to all agents that are suspected to be infected with BBPs.

Saliva, nasal secretions, sweat, tears, urine, emesis, and feces are not assumed to be contaminated with BBPs unless they are visibly contaminated with blood. In circumstances where it is difficult to tell, universal/standard precautions must apply.

B. General Work Practices

In addition to the application of universal/standard precautions, which is a methodical approach to infection control, the following general work practices must be observed and followed by all employees who have the potential to be exposed to BBPs, materials of human origin, or OPIM. Any specific hazards that are not addressed in the following work practices must be addressed by the development of department-specific SOPs.

- Only employees who have completed BBP training are allowed to conduct experiments or manipulate samples of BBPs, human blood, human bodily fluids, or OPIM.
- Only employees who have completed BBP training are allowed to disinfect/decontaminate surfaces contaminated with BBPs, human blood, human bodily fluids or OPIM.
- When decontaminating surfaces, use an appropriate disinfectant solution (e.g. – 10% bleach solution, 70% ethanol, or another EPA approved disinfectant). Always consider the type of surface to be disinfected/decontaminated when selecting a disinfectant.
- When decontaminating surfaces contaminated with BBPs, human blood, human bodily fluids, or OPIM, ensure that these procedures are performed in a manner as to minimize the formation of aerosols, splashes, and sprays.
- Always wear the appropriate PPE for the task being performed (e.g. – gloves, protective clothing, safety goggles, shoe covers, etc.).
- If breaks in the skin, such as cuts, lacerations, or dermatitis, are present, additional barriers of protection such as water-proof bandages should be worn under PPE until the condition is resolved.
- After completing decontamination/clean-up procedures, discard all waste materials, including the PPE used as biohazard waste, which must be collected by EHS.
- Never reach with your hands into areas where you cannot see.
- Do not compress waste in a garbage can or any other waste container by hand.
- Never pick up broken glass or sharp objects with your hands, but use a broom/dustpan, tongs, respectively.
- Reusable containers (e.g., garbage cans) which have a potential for becoming contaminated with BBPs, human blood, human bodily fluids, or OPIM must be inspected, cleaned, and decontaminated immediately after use, or as soon as possible upon visible contamination.

Decontamination of reusable containers must be performed in a manner to minimize exposure to BBPs, human blood, human bodily fluids, or OPIM.

If there is a risk for percutaneous injury to employees, reusable containers must not be opened, emptied, or cleaned manually or in any other manner.

Do not eat, drink, smoke, or apply cosmetics in work areas.

Never store food, drinks, containers meant for food and drinks, or eating utensils in areas where chemicals or potentially infectious materials are stored.

Always wash your hands with warm water and soap after handling materials contaminated with human blood or OPIM, even after removing gloves.

If a sink with soap and warm water is not immediately available, it is acceptable to use hand sanitizer or antiseptic towels until it is possible to wash at a sink.

C. Personal Protective Equipment

All employees who are anticipated to have occupational exposure to infectious materials must be provided adequate PPE, which must be worn while performing duties where exposure to these infectious agents is possible. This PPE must include, at minimum, gloves, and eye protection with side shields. Tight fitting splash goggles are strongly recommended when working with liquids or when there is a potential for splashing. Other forms of PPE may include face shields, shoe covers, and protective clothing such as lab coats, gowns, and aprons.

- Appropriate PPE will be provided by the employer (at no cost to employees) and will be selected based on the task(s) being performed.
- The employer must ensure that the appropriate PPE is readily available in the work area in a variety of sizes to properly outfit employees.
- The PPE will be considered appropriate only if it prevents human blood or OPIM from reaching the employee's clothing, skin, eyes, mouth, or mucous membranes under normal conditions, and for the entire time that it is worn.
- The wearing of PPE by employees will be enforced by the responsible party (PI, LS, etc.) in their respective work areas.

Note: PPE requirements will vary depending on the work area, the type of work being performed, or the anticipated exposure.

PPE must be removed prior to leaving the work area to prevent possible contamination of other areas.

Disposable PPE that has been contaminated with human blood or OPIM must be discarded as biohazard waste. Reusable PPE must be decontaminated after use.

1. Gloves

Gloves must be worn by employees for hand protection against infectious materials. Gloves must be worn when performing the following duties:

- Handling or working with human blood, human bodily fluids or OPIM.
- Working with items or containers that may contain human blood, human bodily fluids, or OPIM.
- Handling or working with materials or on surfaces that may be potentially contaminated with human blood or OPIM When decontaminating surfaces or equipment that may be contaminated with human blood or OPIM.

Other considerations for wearing gloves are as follows:

- Disposable gloves must not be used when visibly contaminated, torn, or the integrity is otherwise compromised.
- Disposable gloves must not be washed or decontaminated for reuse.

Considerations must be made for individuals with latex allergies, and alternatives to latex gloves must be provided.

2. Protective Clothing

Protective clothing must be worn when there is potential for contamination of employees' clothing or exposed skin by infectious materials.

Lab coats, aprons, or disposable gowns must be worn when there is potential for gross contamination of an employee's person or clothing, or when there is the likelihood of the generation of aerosols or splashes of human blood or OPIM.

When appropriate, head covers, shoe covers, and/or rubber boots must be worn.

Protective clothing must be removed prior to leaving the work area to prevent contamination of other areas.

Disposable protective clothing must be discarded as biohazard waste. Reusable, contaminated protective clothing must be laundered by a KSU approved vendor prior to reuse.

Protective clothing must not be laundered at a dry-cleaning service or in employees' homes.

3. Eye and Face Protection

Eye and face protection must be worn when there is potential for exposure to the eyes, mouth, or other mucous membranes through aerosols or splashes of human blood or OPIM.

At minimum, safety glasses with side shields must be worn when working with infectious materials.

Tight-fitting, splash-proof goggles must be worn when there is potential for exposure to the eyes through generation of splashes and/or aerosols.

Face shields must be worn in addition to eye protection when it is reasonably anticipated that an exposure could occur through splashes, sprays, aerosols, droplets, or splattering of human blood or OPIM.

D. Housekeeping

All employees who have the potential to be exposed to BBPs, human blood, human bodily fluids, OPIM, or any other infectious agents while performing work duties must adhere to the following general housekeeping requirements:

- All work surfaces and equipment that have the potential to be contaminated with infectious agents must be cleaned and disinfected regularly using an EPA approved disinfectant.
- Work surfaces where infectious agents will be used should be layered with a protective covering, such as absorbent bench paper or other absorbent materials to facilitate decontamination.
- After work with infectious materials has been completed, work surfaces and equipment must be contaminated immediately afterwards.
- Items which are intended for regular use with infectious materials (e.g. – waste receptacles, bins, tools, utensils, etc.) must be decontaminated regularly, and immediately when visible contamination is present.

- All spills of infectious agents must be addressed immediately using an appropriate disinfectant (e.g. – 10% bleach solution, 70% ethanol, or other EPA approved disinfectants).
- Individuals who decontaminate work surfaces and/or equipment contaminated with infectious agents must wear the appropriate PPE (i.e. – eye protection, gloves, lab coat/apron, lab appropriate attire, and closed toe shoes).

4. Additional Methods of Implementation and Control in Clinical, Research, and Teaching Laboratories

In addition to observing universal precautions and following general work practices, more specific methods of implementation and control are required in laboratory settings where exposure to BBPs, human blood, human bodily fluids, and OPIM are anticipated. The following controls and work practices must be in place for the protection of personnel who work in research, clinical, or teaching laboratories. Any specific hazards that are not addressed in the following work practices must be addressed by the development of department-specific SOPs.

A. Engineering Controls

Effective engineering controls must be employed to minimize or eliminate the potential for exposure to human blood, human bodily fluids, BBPs, OPIM, and other infectious materials. Engineering controls are designed to prevent employee exposure to workplace hazards by either removing the hazard from the worker or limiting employee access to the hazard. If engineering controls are proven to be ineffective or are not available, a hazard assessment will be conducted by EHS to determine what controls are necessary, and that they are implemented accordingly. Under this ECP, the following engineering controls must be used to minimize employee exposure to BBPs.

1. Hand Washing Facilities

Hand washing facilities must be available for individuals who have the potential to be exposed to BBPs, human blood, human bodily fluids, or OPIM.

Sinks are located in laboratories, laboratory support areas restrooms, and other locations on KSU's campuses.

Each hand washing facility must have running water with soap and paper towels.

If an area is not equipped with a sink, or if installation of a sink is not feasible, hand sanitizer or antiseptic towels must be provided as a temporary solution. In this instance, exposed individuals should locate the nearest sink and wash with soap and water as soon as possible.

2. Sharps Containers

During the use and disposal of sharp objects or tools, such as syringes, scalpels, razor blades, or Pasteur pipettes, great care must be taken to prevent injury or exposure via route of injection. When working with sharps are glass items that may contain or be contaminated with infectious materials, the potential exists for exposure through puncture wounds, cuts, and lacerations. Therefore, when working with sharps, sharps containers must be made available, and must meet the following criteria:

- Positioned as close to the point of use/disposal as feasible.
- Puncture resistant, leak proof, closable when not in use, and labeled with the universal biohazard symbol.
- Situated upright during use.

- Not be overfilled (i.e., should only be filled $\frac{3}{4}$ full).

3. Emergency Eyewash Stations

Emergency eyewash stations must be made available in areas where there is a potential for eye exposure to hazardous agents. Eyewash stations are available in laboratory areas near sinks or in hallways often coupled with emergency showers. Emergency eyewash stations must meet the following criteria:

- Double-ocular so that both eyes can be rinsed simultaneously.
- Hands-free operation once activated.
- The water flowing through the eyewash station must be tepid (between 60° – 100° F).
- Dust caps must be kept in place when not in use to prevent the settling of dust on the eye pieces (replacement caps can be ordered if not available).
- Must be free of obstructions.
- Must be tested at least monthly; those coupled with emergency showers must be tested monthly. Each test must be documented (signature of tester and the date of the test).

4. Biological Safety Cabinets

Laboratory work that could result in the creation of aerosols, droplets, splashes, and/or spills of infectious materials must be conducted inside of a containment device such as a biological safety cabinet (BSC). Using these materials on a benchtop or laminar flow hood without proper containment may increase the likelihood of an exposure. BSCs must meet the following criteria:

- Certified annually.
- Front grills must be free of obstructions to allow adequate ventilation.
- Prohibit the use of Bunsen burners inside.
- Be decontaminated after use.

For more information on the proper use and maintenance of BSCs, refer to the [BMBL](#).

All work in laboratories involving human blood, OPIM, or BBPs must be conducted at Biosafety Level 2 (BSL-2), as defined by the CDC in the [BMBL](#). For work involving the drawing of blood using syringes, see the section on the “Use of Sharps” below.

All work with human blood, OPIM, or BBPs must be performed in a manner as to minimize the formation of aerosols, splashes, and sprays.

Standard microbiological practices must be employed when manipulating infectious materials.

Engineering controls such as BSCs must be used as containment devices to minimize the potential for exposure.

B. Laboratory Work Practice Controls

- Mouth pipetting is prohibited.
- Eating, drinking, smoking, and the application of cosmetics is prohibited in all laboratory areas.
- Storage of food, drinks, containers meant for use with food and drinks, or eating utensils in refrigerators or areas where chemicals or potentially infectious agents is prohibited.
- Individuals must wear the appropriate lab attire and PPE (closed toe shoes, long pants, laboratory coat, task appropriate gloves, and eye protection with side shield protection) to

provide an additional barrier of protection when working with infectious materials, including BBPs.

- All hazard signs and postings must be observed and followed.

4. Use of Sharps

Avoid the use of sharps (e.g. – needles, syringes, razor blades, scalpels, etc.) where possible. When sharps must be used, they must not be recapped, bent, sheared, or discarded in regular trash.

After use, sharps must be immediately discarded into a hard-walled sharps container that is closable and is properly labeled with the universal biohazard symbol.

Where possible, needleless devices and safety devices (e.g. – retractable needles) should be used to reduce exposure potential to infectious materials.

Never reach into a sharps container to retrieve used sharps.

5. Reusable Containers

Reusable containers which have a potential for becoming contaminated with BBPs or OPIM must be inspected, cleaned, and decontaminated immediately after use, or as soon as possible upon visible contamination.

Decontamination of reusable containers must be performed in a manner to minimize exposure to BBPs or OPIM.

If there is a risk for percutaneous injury to employees, reusable containers must not be opened, emptied, or cleaned manually or in any other manner.

6. Biological Samples and Specimens

As prescribed by the CDC and NIH in the [BMBL](#), all processing or analyses of human blood, OPIM, or other infectious agents must be conducted under BSL-2 containment.

Any procedure involving the use of human blood, OPIM, or other infectious agents should be performed in a manner that minimizes splashing, aerosolization, and/or spraying of these materials.

All materials of human origin must be treated as though they are infectious unless appropriate screening has been conducted and the materials have been certified as free of BBPs.

When working with infectious materials, standard microbiological work practices must be used to minimize the spread of contamination and potential infection.

All samples of infectious materials must be placed in a container that prevents leaking during collection, handling, processing, storage, transport, or shipping.

The container must be labeled with the standard biohazard symbol and closed prior to being stored, transported, or shipped.

When samples are being transported, primary containers (vials, collection tubes, etc.) must be packed into a sturdy secondary container. Secondary containers must also be labeled with the standard biohazard symbol.

If it is possible for the primary container to puncture the secondary container, then the secondary container must be puncture resistant.

Note: Only KSU employees who have received the appropriate Department of Transportation (DOT)/International Air Transport Association (IATA) training are authorized to ship infectious agents or hazardous materials. If assistance is needed for shipping biological or infectious materials, contact EHS for assistance.

C. Laboratory Equipment

1. Centrifuge Use

Centrifuges are commonly used in laboratories as a means of separating materials according to size and density. If used inappropriately, centrifuges can cause exposure to the materials used in them. Consider the following when using centrifuges with infectious materials:

- Follow the manufacturer's instructions and appropriate lab SOPs for centrifuge use.
- Ensure that all tubes for use in the centrifuge are compatible.
- When loading samples, use centrifuge safety caps or sealed rotors to prevent spills and/or generation of aerosols.
- Do not attempt to operate the centrifuge while the door/lid is open.
- Before removing samples, wait 10 minutes before opening the centrifuge to allow any aerosols produced to settle.
- Always wear appropriate PPE when loading and removing samples from the centrifuge.
- Decontaminate all spills immediately using an appropriate EPA approved disinfectant.

2. Autoclave Use

Autoclaves and sterilizers use steam, extreme heat (sometimes more than 250 degrees Fahrenheit), and pressure as a means of decontaminating and/or sterilizing materials, including but not limited to metal instruments, liquids, and infectious waste materials. Consider the following when operating autoclaves/sterilizers:

- Anyone who will be authorized to use an autoclave must first be trained in its operation.
- Prior to using an autoclave, any items remaining inside should first be removed.
- When using the autoclave to deactivate infectious waste, ensure that the unit is validated using the spore test method; this ensures that the unit reaches the necessary temperature to deactivate pathogens.
- Follow the appropriate SOP for operating the autoclave.
- Autoclaves should never be overloaded.
- Wear appropriate PPE when removing materials from the autoclave (e.g., long thermal gloves, lab coat, eye protection, closed toe shoes), as not doing so may result in severe burns.
- When handling sharp instruments that have been autoclaved, use cut resistant gloves to prevent inadvertent incisions or lacerations.
- Never attempt to open an autoclave while it is in operation. Autoclaves are pressurized vessels and doing so could result in the release of steam, the ejection of the components or contents of the autoclave, and the sudden release of the autoclave door, all which could result in the severe injury or death.

Preventative maintenance must be performed on autoclave units periodically to prevent mechanical failure. Maintenance must be conducted according to the manufacturer's specifications, and by an individual trained in recognizing critical defects that could result in a mechanical failure. A maintenance history should be kept indicating all inspections, failures, and repairs.

5. Medical Waste and Decontamination Procedures

A. Biological/Infectious Waste

Biomedical/infectious waste, according to Georgia [Rule 391-3-4-.15](#), includes pathological waste, blood and blood products, cultures and stocks of infectious agents, contaminated animal carcasses, contaminated sharps, chemotherapy waste, and discarded medical equipment and parts. These materials must be handled and disposed of as follows:

- Biomedical/infectious waste must be collected in containers that are properly labeled (biohazard symbol with the word “Biohazard”), closeable, and leak proof.
- Containers must remain closed unless waste is being added to prevent leaking or spillage.
- In the event that the waste container becomes contaminated, it must be placed in a secondary container that is also closable, leak proof, and labeled appropriately.
- Must be segregated from all other waste materials at the point of origin.
- Liquid biomedical waste, including blood and blood products, exudates, secretions, suctionings, and other body fluids must not be discarded down the drain.
- Solid biomedical waste must not be discarded in the general waste stream.
- Contaminated sharps must be contained in leak proof, rigid, puncture resistant containers which are tightly lidded or taped closed to prevent spilling of contents during storage, transportation, treatment, and/or disposal.
- All biomedical/infectious waste must be decontaminated prior to disposal (autoclaving, chemical deactivation, etc.), or shipped by EHS to be incinerated through an appropriate vendor.

For more guidance on the handling of biomedical/infectious waste, reference [Rules and Regulations of the State of Georgia, Rule 391-3-4](#).

B. Protection of Vacuum Lines

Tissue culture work in laboratories generates liquid wastes that must not be discarded prior to treatment. Usually, vacuum systems are used to aspirate these wastes. According to the recommendations of the CDC and the NIH, the vacuum lines of these systems should be protected as follows:

- Vacuum lines should be equipped with high efficiency particulate air (HEPA) filters and liquid disinfectant traps to prevent contamination of the exhaust system or aerosolized pathogens.
- The filters must be checked regularly and replaced, as necessary.
- The HEPA filter, installed inline, will isolate, and confine infectious materials and prevent aerosol contamination of the vacuum pumps. This measure provides proper disinfection and disposal procedures for tissue culture wastes.

C. Chemical Decontamination

Work surfaces, reusable containers, and equipment used with human blood, OPIM, and other infectious materials must be decontaminated regularly to prevent the spread of contamination and infection. Certain chemicals can be used in the deactivation of infectious materials.

- Appropriate disinfectants such as bleach and other EPA registered disinfectants can be used for decontamination purposes.
- Household bleach (5% sodium hypochlorite) can be diluted to a 10% solution (one part household bleach, nine parts water), which is sufficient for the deactivation of BBPs.
- Diluted bleach solutions lose effectiveness over time; therefore, it is important to make fresh 10% bleach solutions daily to ensure effective decontamination of surfaces.
- 70% ethanol or isopropanol are also effective disinfectants and can be purchased at this concentration or diluted from concentrated materials.
- The US Environmental Protection Agency (EPA) has a [list of approved disinfectants](#) that can be used for chemical decontamination of surfaces.
- All chemical disinfectants are specific in their target organisms and should be selected based on the organism(s) the end user needs to eliminate.
- When using chemical disinfectants, the end-user must follow the manufacturer's instructions for method of application and contact time for effectiveness.

D. Laboratory Attire and Laundry

Laboratory coats or other protective attire such as gowns or aprons must be worn when working in laboratory areas where human blood, OPIM, and other infectious materials are manipulated/processed. Contaminated laboratory attire must be handled as follows:

- Disposable laboratory coats or other protective attire such as surgical masks, head covers, shoe covers, etc., that become contaminated with human blood, OPIM, or other infectious agents, must be disposed of as regulated medical waste.
- Reusable laboratory coats contaminated with human blood, OPIM, or other infectious materials must be placed in an appropriate container (e.g. – laundry bag, clothes hamper, etc.) labeled with the standard biohazard symbol (fluorescent orange or red with contrasting colors for symbols and print).
- Contaminated laboratory coats must be picked up, laundered, and returned by a vendor approved by the university.
- Contaminated laboratory coats, uniforms, or other protective attire must not be laundered at a dry-cleaning business or in employees' homes.

6. Medical Surveillance

A. Vaccinations

Employees with potential for exposure to BBPs and/or OPIM must be afforded the opportunity to receive Hepatitis B vaccination. The following accommodations must be made in accordance with OSHA [29 CFR 1910.1030](#) and the Hepatitis B vaccination will be offered to each employee with potential occupational exposure, unless one of the following conditions exists:

- The employee has previously had the full series of the vaccination and documentation can be provided to confirm.
- The employee has been tested for antibodies and immunity is confirmed.
- The employee cannot be administered the vaccination for medical reasons.
- If an employee declines the vaccination for any reason, they must sign a written statement confirming their declination.

- If an employee who has potential workplace exposure initially declines to have Hepatitis B vaccine, but later decides to accept the vaccination, the vaccination must be made available at that time.

B. Post Exposure Evaluation and Follow-Up

The following accommodations must be provided for any employee after they have reported an occupational exposure to human blood, OPIM, or other infectious materials. KSU will provide each exposed employee the opportunity to have a confidential medical evaluation and follow-up consultation which must include, but not be limited to, the following elements:

- The documentation of the routes of exposure and the circumstances under which the exposure incident occurred.
- Identification and documentation of the source or source individual, unless KSU can establish that identification is not possible, or is prohibited by state or local law.
- After consent has been given by the source individual, their blood must be tested as soon as possible to determine HBV, HCV, and HIV infectivity. If consent cannot be obtained, KSU must establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, their blood, if available, must be tested and the results must be documented.
- If the source individual is already known to be infected with HBV or HIV, then testing of their blood will not be required.
- The results of the source individual's tests must be made available to the exposed individual, and they must be informed of the applicable laws and regulations concerning disclosure of the identity and infectious state of the source individual.
- A sample of blood from the exposed individual will be collected as soon as possible after obtaining consent.
- Post-exposure prophylaxis, when medically indicated, will be provided as recommended by the US Public Health Service (USPHS).
- Counseling must be made available regarding reduction of risk and the risks and benefits of testing in accordance with state law.
- KSU will provide a copy of this ECP to the health care professional responsible for the Hepatitis B vaccination.

The health care professional who evaluates personnel after an exposure will be provided with the following:

- A description of the exposed employee's job responsibilities as they relate to the exposure event.
- Documentation of the routes of exposure and the circumstances under which the event occurred.
- The results of the source individuals blood tests (if available).
- All medical records relevant to the appropriate treatment of the employee, including vaccination status, maintained by KSU.

For each exposure evaluation, KSU must obtain and provide exposed individuals with a copy of the evaluating health care professional's written opinion within 15 working days. Healthcare professionals' written opinions must be as follows:

- Regarding Hepatitis B vaccination, whether vaccination is indicated for an employee, and if the employee has received the vaccination.
- For post exposure evaluation and follow-up, statements must include that the exposed employee has been informed of the results of the evaluation, and about any medical condition(s) that remain as a result of exposure to human blood or OPIM that require further evaluation or treatment.

All other information must be kept confidential, and not included in the statement, but will be available to the employee and their representative in accordance with Health Insurance Portability and Accountability Act (HIPAA) laws.

7. Information and Training

A. Training

All employees who have the potential for occupational exposure to BBPs, human blood, human bodily fluids, and OPIM must participate in the BBPs training program established by KSU, and must be trained in accordance with OSHA [29 CFR 1910.1030](#). Training must be provided for each qualifying employee as follows:

- At the time of initial assignment of job duties that have the potential for exposure to human blood and OPIM.
- Refresher training is required at least annually and must be provided within one year after initial training.
- Additional training must be provided as a result of modifications to work practices or the addition of new work practices that may affect employees' exposure potential.

Individuals who administer training on BBPs must be knowledgeable in all content presented in the training program as well as how it relates to the workplace environment. Training administrators must allow all personnel attending the training course to ask interactive questions on the subject matter.

Training may be provided using the following methods:

- Personal instruction (i.e., classroom model)
- Computer based training (i.e., online model)
- Training manuals
- Through media sources such as videos or newsletter articles published by EHS

B. Additional Training Requirements

For some work environments, such as clinical laboratories or research laboratories where personnel work with human blood, OPIM, or BBPs, additional laboratory specific training is required.

The PI or LS must ensure all personnel who have occupational exposure potential have prior experience working with human pathogens or tissue cultures.

Personnel must demonstrate proficiency in standard microbiological practices before working with HIV, HCV, or HBV.

The employee must not participate in work involving infectious agents until proficiency is demonstrated.

A training program must be provided to employees who have no prior experience in handling human pathogens. Initial work activities must not include the handling of infectious agents. A progression of work activities must be assigned as techniques are learned and proficiency is developed. The employer

must assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

C. Signage and Postings

All work areas where biological agents are used or stored must be posted with the appropriate biohazard warning labels. These areas include, but are not limited to, research laboratories, teaching laboratories, clinical laboratories, animal facilities, HIV/HBV research and production facilities ([29 CFR 1910.1030](#)), autoclave rooms, and biomedical waste storage areas. The following criteria must be met for the hazard/warning labels:

- Labels must be mostly fluorescent orange or red with symbols and lettering in contrasting color (usually black).
- The universal biohazard symbol must be present.

Biohazard warning labels must be affixed to the following:

- Containers of infectious waste.
- ***Infectious waste that has been decontaminated is exempt from this requirement.***
- Equipment used to manipulate or process infectious materials (e.g., centrifuges, BSCs, incubators, etc.).
- Equipment used to store infectious materials (e.g., refrigerators, freezers, liquid nitrogen dewars, etc.).
- Containers used to transport human blood, human bodily fluids, OPIM, or other infectious materials.
- Laundry bags used for collecting contaminated lab coats or other protective clothing.

Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical uses are exempted from the labeling requirements. Individual containers of human blood or OPIM that are placed in labeled containers during storage, transport, shipment, or disposal are also exempt.

Biohazard warning labels must be affixed to containers in a way that prevents loss or unintentional removal, either by adhesive, string, wire, or any other successful method.

Access doors to areas where human blood, OPIM, and other infectious agents are used under biosafety containment must be labeled with the standard biohazard symbol and the appropriate biosafety designation (i.e., BSL2).

8. Emergency Procedures

In the event of an emergency involving BBPs, human blood, human bodily fluids, or OPIM, remember that personal safety is paramount. Immediate emergency response may reduce the potential for human exposure and disease.

E. Exposure to Bloodborne Pathogens or Other Potentially Infectious Materials

When any employee is exposed to human blood, BBPs or OPIM, the following steps must be taken:

- Immediately wash the affected area
- For eye exposures, go to the nearest emergency eyewash station, activate the eyewash, hold open the eyelids, and wash the eyes for a minimum of 15 minutes.

- For percutaneous exposures such as needle sticks, cuts, lacerations, or other open wounds, go to the nearest sink and wash the affected area with soap and warm water for a minimum of 15 minutes.
- For exposure via intact skin, go to the nearest sink, remove clothing (if necessary), and wash the affected area with soap and water.
- If necessary, call or have someone call the KSU emergency number (KSU Police) at 470-578-6666 (ext. 6666) or 911 for emergency help, clearly stating the nature of the incident and the location where it occurred.

After immediate care has been administered, the exposed individual should follow up with a medical professional for post exposure follow-up.

F. Spill Procedures

The following procedures must be followed for all spills involving human blood, BBPs, or OPIM:

- All spills must be contained and cleaned by trained employees. If there are no trained employees available to clean the spill, contact EHS.
- Universal precautions must be observed. The appropriate PPE must be worn when cleaning spills (i.e., gloves, eye protection, protective clothing, etc.).
- All surfaces contaminated with infectious materials must be decontaminated using an appropriate disinfectant (e.g. – 10 % bleach, 70 % ethanol, or other EPA approved disinfectants).
- All spill materials, including contaminated PPE, must be discarded as biohazard waste in accordance with the KSU Hazardous Waste Program.

G. Incident Reporting

All incidents, including accidents, injuries, and near misses involving human blood, BBPs, or OPIM must be promptly reported to the individual's supervisor, to EHS, and via the university's [incident reporting procedure in Reliance](#). Prompt and thorough investigations of many of these incidents can identify their causes so that appropriate actions can be taken to prevent similar occurrences. The following procedures must be followed for reporting:

- All incidents must be reported in accordance with the university process for [Incident Reporting and Investigations](#). The incidents should be reported using the appropriate [Incident Reporting Form from the EHS website](#).
- All incidents must be reported to the PI/LS and to EHS as soon as possible.
- All KSU employees and contractors should report, as soon as possible, any of the following that occurs on campus, at a university-controlled workplace, or while engaged in any university sanctioned activity:
 - Incidents resulting in injury or illness.
 - Incidents or near misses with no injuries.
 - Incidents resulting in release of infectious materials to the environment (e.g., untreated biohazard waste released down the drain, in regular waste stream, etc.).
 - Any situation or condition observed on the job which has the potential for exposure to infectious agents or otherwise endangering human health.
 - Serious incidents or incidents requiring immediate medical attention should be reported immediately by calling the campus emergency number 470-578-6666 (Ext.6666) or 911. Serious accidents for this purpose are those which result in:

- Fatality
- Hospitalization or medical treatment (beyond first aid) for both KSU's and non-KSU personnel
- Fire
- Property damage exceeding \$1,000.00.

All other incidents must be reported in writing within 24 hours of becoming aware of the incident, injury, or illness.

9. Recordkeeping

A. Sharps Injury Log

KSU must maintain a sharps injury log of all percutaneous injuries associated with contaminated sharps in accordance with the OSHA Bloodborne Pathogens Standard ([29 CFR 1910.1030](#)). The sharps injury log must include at least the following elements:

- The type and brand of the device involved in the incident.
- The department or work area where the exposure incident occurred.
- An explanation of how the incident occurred.
- ***All information recorded in the sharps injury log must be kept in a manner as to maintain confidentiality.***

B. Medical Records

KSU, in accordance with [29 CFR 1910.1020](#), will establish and maintain accurate records for all employees who have had occupational exposure to BBPs or other infectious agents. These medical records include at least the following elements:

- Employee name and a designated identification number (e.g., employee number, student ID number, etc.).
- A copy of the employee's Hepatitis B vaccination status, including the dates of all Hepatitis B doses, and any medical records related to the employee's ability to receive the vaccination.
- A copy of all exam results, medical testing, and follow-up procedures.
- The employee's copy of the health care professional's written opinion.
- A copy of the employee's duties as they relate to the exposure incident, the route(s) of exposure and circumstances under which the exposure occurred, and the results of the source individual's blood tests.

KSU must ensure that all medical records are:

- Kept confidential.
- Not disclosed or reported without the employee's express written consent to any person outside the workplace except as required by the standard or by law.
- Maintained for at least the duration of employment plus 30 years.

C. Training Records

EHS will maintain records of BBP training while the PIs/LS/LM are responsible for maintaining operation/procedure specific and continuing education training for employees and students under their supervision.

Training records must be kept for 3 years from the date on which the training occurred.

D. Availability of Records

Records required to be maintained under this program will be made available through EHS in accordance with applicable policies, rules, and regulations.