

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, involving 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, appropriate equipment, proper facilities and awareness, all operations can be handled safely, without undue risk to KSU's employees, students, properties or the environment.

The responsibility of ensuring a safe work environment at KSU is a shared responsibility between employees, administrators and 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 OSHA Bloodborne Pathogens Standard ([29 CFR 1910.1030](#)), and is provided to all faculty, staff, employees, and students in an effort to minimize or eliminate the potential for exposure to bloodborne pathogens (BBPs) in the work and or learning environment. This ECP includes the following elements:

- Employee exposure determination
- Exposure control methods
  - Universal Precautions
  - Engineering controls
  - Work practice controls
  - Personal Protective Equipment (PPE)
  - Housekeeping
- Vaccination recommendations (Hepatitis B)
- Post-Exposure evaluation and follow-up
- Training
- Record keeping
- Incident Reporting

The PIs and laboratory supervisors/managers should supplement the ECP with task-specific instructions and guidance regarding specific practices and procedures unique to the work being done, where potential for exposure to blood-borne pathogen exist. 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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Information on bloodborne pathogens and other infectious agents; Biohazard information; Laboratory spills or accidents involving biohazards or chemicals; Biological safety cabinets; Recombinant DNA guidelines; Chemical hygiene plan	Rodrick Esaw, Laboratory Safety Manager and Biosafety Officer (470) 578-4803
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Ventilation (HVAC) problems; Fume hood operation; Laboratory safety design	Plant Operations/HVAC Shop Tel: (470) 578-6224 Web: <a href="http://web.kennesaw.edu/plantops/">web.kennesaw.edu/plantops/</a>
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**\*For the most current contact information, access the EHS website at [www.kennesaw.edu/ehs/](http://www.kennesaw.edu/ehs/).**

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## SCOPE AND APPLICATION

### 1) Purpose

The purpose of the Exposure Control Program (ECP) is to outline the regulatory requirements and effective control measures to minimize potential for exposure to BBPs, including but not limited to Hepatitis B (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV). The information provided is based on the Occupational Health and Safety Administration (OSHA) Bloodborne Pathogen (BBP) Standard (29 CFR 1910.1030), and the best practices outlined by the Center for Disease Control's (CDC) - Biosafety in Medical and Biomedical Laboratories, 5th Edition (BMBL).

### 2) Scope

The ECP applies to activities in all facilities owned, leased or operated by KSU, where KSU employees and students have the potential to be exposed to BBPs while performing their work duties or in their learning environment. The exposure determination in Section 3 highlight the various job classifications that are covered under this ECP based on their potential for exposure to human blood, human blood components, BBPs, or other potentially infectious materials (OPIM).

## ROLES AND RESPONSIBILITIES

### 1) 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:

- Ensuring appropriate training is provided to personnel who have the potential to be exposed to BBPs while performing their job duties.
- Providing appropriate personal protective equipment (PPE) for employees.
- Making available to all affected employees the necessary vaccinations (specifically, the Hepatitis B vaccine) at no cost, and to obtain a declination form from all individuals who decline to receive the vaccine.
- Establishing and implementing policies for safe conduct during research activities involving work with materials of human origin and BBPs.
- Providing adequately designed facilities and containment devices for work with biological agents.
- Establishing and maintaining a health surveillance program for personnel.
- Reporting any significant problems, violations, or significant research-related accidents or illnesses to the NIH Office of Biotechnology Activities (OBA) within 30 days.

## 2) Deans

- Creating vision, enforce policy, set performance expectations, and ensure timely availability of resources that support the ECP.
- Providing leadership to ensure effective implementation of the ECP and ensure the College's compliance with governing laws, regulations, and policies. To this end, Deans may designate a safety officer(s) within the College/School.
- Reviewing laboratory and safety-related assessment reports as a means to assess and direct actions necessary to continually improve safety at the College/School.

## 3) Department/School Chairpersons

- Setting performance expectations, managing biosafety risks, and ensuring the Department's compliance with this program and other Environmental and Occupational Safety (EOS) governing laws, regulation and policies.
- Effectively implementing KSU's ECP and its requirements within their respective units and laboratories.
- As appropriate, incorporating the ECP requirements and responsibilities into employee job descriptions and addressing performance related to the same.
- Ensuring that individuals under their supervision, including but not limited to supervisors, regular and temporary employees, contractors, and other affected personnel, obtain required BBP training.
- Developing a process to maintain incident/illness prevention and environmental protection programs within the department.
- Ensuring prompt reporting and appropriate investigations of incidents/accidents within the unit, in accordance with the University's Incident Reporting and Investigation requirements (EOSMS-108).
- Ensuring development and implementation of a process for conducting hazard/risk assessments within their respective unit or laboratory inclusive of periodic safety inspections of work areas and/or facilities and ensuring non-compliance items are corrected with follow-up and closure.
- Ensuring assessment of the environmental and occupational safety impact of BBPs, processes and equipment, and incorporating appropriate controls.

## 4) Environmental Health & Safety (EHS)/Biosafety Officer (BSO)

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

- Developing, implementing, and maintaining the university's ECP.
- Developing protocols and procedures to address exposure concerns.
- Providing training in the safe use and practices for those working with BBPs, materials of human origin, and OPIM.

- Providing technical advice to PIs, supervisors, the Institutional Animal Care and Use Committee (IACUC), and Institutional Biosafety Committee (IBC) on research safety procedures.
- Consulting with researchers on issues of animal care, biosafety, and the safe use of biological materials in the laboratory.
- Performing periodic inspections to ensure that standard operating procedures are being followed and regulatory requirements are being met.
- Providing guidance to researchers on laboratory security.
- Providing guidance to researchers on proper waste disposal methods in accordance with federal and state regulations.
- Assisting in the development of emergency plans for handling accidental spills and personnel contamination.
- Investigating accidents involving BBPs, materials of human origin, and OPIM.

## 5) Institutional Biosafety Committee (IBC)

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

- Providing guidance and support in the development of policies and procedures established for activities involving BBPs, materials of human origin, and OPIM.
- Ensuring that all policies, practices and facilities meet regulatory, state, and University requirements.
- Reviewing and approving risk assessments.
- Reviewing research proposals involving BBPs, materials of human origin, and OPIM.
- Based on risk assessment and review of research proposals, approving or disapproving proposals based on level of risk.

## 6) Principal Investigators (PIs)

PIs are responsible for conducting diagnostic and/or research activities in a manner which minimizes the risk in the laboratory environment. These responsibilities include, but are not limited to:

- Obtaining the required approval from the IBC for new research proposals as well as amended existing proposals (i.e. – addition of new agents, animals, etc.) prior to the commencement of such work with BBPs, materials of human origin, and OPIM.
- Completing and documenting risk assessments conducted for the purpose of determining level of risk and/or lowering the level of risk.
- Ensuring that lab employees and support personnel who will work with these materials are: (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 recognized and potential hazards
  - Informed of the indicators of accidental infections
- Establishing standard operating procedures (SOPs) for laboratory work.
  - In collaboration with the BSO, ensuring that the appropriate immunizations, serologic monitoring, post exposure prophylaxis, and other medical monitoring are provided to personnel.
  - In collaboration with EHS and the BSO, developing procedures for dealing with accidental spills and accidental exposures among personnel.
  - Reporting to the BSO and/or EHS issues pertaining to:
    - All accidents/incidents within the lab that may pose a risk
    - Exposure of personnel to BBPs, materials of human origin, and OPIM
    - Compromise of biological or physical barriers
    - Major equipment failure which could compromise safe operations in the laboratory
  - In conjunction with the BSO, correcting procedures, which may result in hazardous incidents or employee exposures

## 7) Laboratory Managers/Laboratory Supervisors (LMs/LSs)

LMs/LSs shall supervise the day-to-day operations lab. Their responsibilities include but are not limited to:

- Overseeing the activities of laboratory employees and students engaged in research involving BBPs, materials of human origin, and OPIM.
- In collaboration with the PI and BSO, ensuring that new staff and/or visiting scientists (e.g. – volunteer workers, high school students, etc.) are properly trained for their assigned tasks.
- Ensuring that lab personnel demonstrate proficiency in standard and special microbiological practices before beginning work.
- Training employees and students on the SOPs in the lab.
- In conjunction with the BSO, ensuring that physical containment systems, support equipment, waste disposal and operation meet the safety guidelines.
- Performing regular checks/assessments of containment devices, equipment, and PPE.
- Notifying the BSO and/or EHS of any incident or problem that compromises the safety of the staff or the integrity of the lab.

## 8) Department Managers/Supervisors (DMs/DSs)

DMs and DSs shall supervise the day-to-day of the work area. Their responsibilities include but are not limited to:

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

## 9) 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 include, but are not limited to:

- Completing BBP Awareness training, departmental training, and any other job specific training offered in a specific work area.
- Conducting all activities in accordance with the University's policies, procedures and guidelines, including the standards in this ECP.
- Familiarizing themselves with the SOPs and potential hazards associated with their work, and emergency procedures.
- Employing good housekeeping practices to help maintain the work area in good condition.
- Completing all medical surveillance requirements.
- Reporting any medical restrictions, reportable illnesses, and any event that may be the result of an exposure to the PI and Lab Manager/Supervisor.
- Reporting irregular workplace conditions or accidents to the PI and EHS immediately.

## EMPLOYEE EXPOSURE DETERMINATION

This ECP applies to all KSU employees and students who have the potential to be exposed to human blood or OPIM while performing their work duties. In accordance with [29 CFR 1910.1030](#), an employee exposure determination has been made. The following is a list of all job classifications at KSU in which **all** employees have occupational exposure.



**NOTE: These individuals are a part of the WellStar Health System, and therefore are not covered under the KSU ECP.**

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

The following is a list of all job classifications in which **some** employees at KSU have occupational exposure. Included are anticipated tasks and/or procedures by which occupational exposure may occur for these individuals:

Job Title	Department (s)	Task/Procedure
Principal Investigator/Faculty	Molecular/Cellular Biology Chemistry and Biochemistry Ecology, Evolution, Behavior, & Organismal Biology (EEOB) Psychology	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Principal Investigator/Faculty	Nursing	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Principal Investigator/Faculty	Exercise and Sports Management	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Laboratory Coordinators	All Departments in College of Science and Math	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.

Laboratory Personnel (managers, technicians, grad students, TAs, etc.)	Molecular/Cellular Biology  Chemistry and Biochemistry  Ecology, Evolution, Behavior, & Organismal Biology (EEOB)	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Registered Nurses	Nursing	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Laboratory Personnel (managers, technicians, clinical students, TAs, etc.)	Nursing	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Laboratory Personnel (managers, technicians, grad students, TAs, etc.)	Exercise and Sports Management	Research and or manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Registered Nurses	Continuing Education (Phlebotomy Program, Healthcare Assistance Program)	Blood draws, manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Laboratory Personnel (instructors, technicians, etc.)	Continuing Education (Phlebotomy Program, Healthcare Assistance Program)	Blood draws, manipulations involving materials of human origin, including blood, cells, tissues, DNA, BBPs, and etc.
Biosafety Officer	Department of EHS	Biohazard spill response, laboratory inspections, etc.
Chemical Safety Officer  Chemical Safety Coordinator	Department of EHS	Handling and storing packages of medical waste
Fire Safety Officer	Department of EHS	Assisting with or administering first aid
KSU Police	Department of Public Safety	Assisting with or administering first aid
Athletic Trainers	NCAA  Sports and Recreation  Intramural Sports	Assisting with or administering first aid, or treatment of athletic injuries

Custodial/Building Services Staff	Department of Plant Operations	Cleaning of laboratory, clinical, or residential areas where human blood or OPIM may be found
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## METHODS OF IMPLEMENTATION AND CONTROL

### 1) Universal Precautions

All personnel who have the potential to be exposed to BBPs shall observe Universal Precautions. Under Universal Precautions, all human blood, tissues, cells, cell lines, DNA, and OPIM are treated as if they are known to be infected with BBPs (e.g.- HIV, HBV, HCV, etc.). OPIM refers to other human bodily fluids including but not limited to cerebrospinal fluid, vaginal secretions, semen, and pleural fluid. 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.

***Note: Saliva, nasal secretions, sweat, tears, urine, emesis, and feces are not assumed to be contaminated with BBPs unless the blood is visible. In circumstances where it is difficult to tell, universal precautions apply.***

### 2) General Work Practices

In addition to Universal Precautions, which is an 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 standard operating procedures (SOPs).

- Only employees who have been trained shall clean up surfaces contaminated with human blood or OPIM.
- When decontaminating surfaces, use an appropriate disinfectant solution (e.g. – 10 % bleach, or another EPA approved disinfectant).
- When decontaminating surfaces contaminated with human blood or BBP, 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/glasses, 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.
- Never reach into areas where you cannot see.
- Do not compress waste in a garbage can 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 or OPIM shall 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.
- 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 agents are stored
- Always wash your hands with warm water and soap after handling materials contaminated with human blood or OPIM, even after removing gloves.
- In the event that 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.

### 3) Personal Protective Equipment (PPE)

All employees who are anticipated to have occupational exposure to infectious agents shall be provided adequate PPE, which must be worn while performing duties where exposure to these infectious agents is possible. This PPE shall include, at minimum, gloves and eye protection with side shields. Other forms of PPE will include splash goggles, face shields, 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 shall ensure that the appropriate PPE is readily available in the work area in a variety of sizes in order 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 condition, and for the entire time that it is worn.
- The wearing of PPE by employees will be enforced by the responsible party (PI, Supervisor, 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.

#### ***a. 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 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 shall not be used when visibly contaminated, torn, or the integrity is otherwise compromised.
- Disposable gloves shall not be washed or decontaminated for reuse.
- Considerations must be made for individuals with latex allergies, and alternatives to latex gloves must be provided.

#### ***b. 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 shall be worn when there is potential for gross contamination of employees' persons 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 shall be worn.
- Protective clothing shall be removed prior to leaving the work area.
- Disposable protective clothing shall be discarded as biohazard waste. Reusable, contaminated protective clothing shall 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.

#### ***c. Eye and Face Protection***

Eye and face protection shall 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 shall be worn when working with infectious materials.
- Splash proof goggles shall be worn when there is potential for exposure to the eyes through generation of splashes and/or aerosols.
- Surgical masks and/or face shields shall 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.

#### 4) Housekeeping

All employees who have the potential to be exposed to BBPs, 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.
- Work surfaces where infectious agents will be used should be layered with a protective covering, such as bench paper or other absorbent materials to facilitate decontamination.
- After work with infectious agents has been completed, work surfaces and equipment shall be contaminated immediately afterwards.
- Items which are intended for regular use with infectious agents (e.g. – waste receptacles, bins, etc.) must be decontaminated regularly, and immediately when visible contamination is present.
- All spills of infectious agents must be cleaned 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 shall wear the appropriate PPE (i.e. – eye protection, gloves, lab coat/apron, lab appropriate attire, and closed toe shoes.)

### **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 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.

## 1) Engineering Controls

Effective engineering controls must be employed to minimize or completely eliminate the potential for exposure to BBPs and materials infected with them. 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 determine what controls are necessary, and that they are implemented accordingly. Under ECP, the following engineering controls must be used to minimize employee exposure to BBPs:

### *e.a. Hand Washing Facilities*

- Hand washing facilities are available for individuals who have the potential to be exposed to BBPs
- Sinks are located in laboratories, restrooms, and other locations on KSU's campus.
- Each hand washing facility must be maintained with running water, soap, and paper towels.
- In the event that an area is not equipped with a sink or installation is not feasible, hand sanitizer or antiseptic towels must be provided as a temporary solution (i.e. – exposed individuals should locate the nearest sink and wash with soap and water as soon as possible).

### *d.b. 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. When used with materials potentially infected with BBPs, 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
- Must remain upright during use
- Must not be overfilled (i.e. – should only be filled  $\frac{3}{4}$  full)

### *e.c. 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
- 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)
- Eyewash stations must be free of obstructions
- Eyewash stations at the sinks must be tested weekly; those coupled with emergency showers must be tested monthly. Each test must be documented (signature of tester and the date of the test).

#### *f.d. Biological Safety Cabinets (BSCs)*

Laboratory work that could result in the creating of aerosols, droplets, splashes, and/or spills of infectious materials (including BBPs) must be conducted inside of a containment device such as a BSC (Class I or Class II). Using these materials on a benchtop or laminar flow hood without proper containment may increase the likelihood of an exposure. Biosafety cabinets must meet the following criteria:

- Biosafety cabinets must be certified annually.
- Front grills must be free of obstructions to allow adequate ventilation.
- The use of Bunsen burners inside a BSC is prohibited.
- BSCs must be decontaminated after use.

For more information on the proper use and maintenance of BSCs, refer to [Appendix A of 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 Centers for Disease Control and Prevention (CDC) in the [Biosafety in Microbiological and Biomedical Laboratories](#) publication. 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.
- Engineering controls such as BSCs must be used as containment devices to minimize the potential for exposure.



## 2) Laboratory Work Practice Controls

### *a. General Laboratory Work Practices*

- 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 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 personal protective equipment (PPE) (closed toe shoes, long pants, lab 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.

### *b. 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 BBPs and OPIM.
- Never reach into a sharps container to retrieve used sharps.

### *c. Reusable Containers*

- Reusable containers which have a potential for becoming contaminated with BBPs or OPIM shall 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.

### *d. 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 should 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.
- Human materials such as cell lines and DNA must be treated as OPIM, unless appropriate screening has been conducted and the materials have been certified as free of BBPs.
- When working with any such materials, standard microbiological work practices must be used to minimize the spread of contamination and potential infection.
- All samples of blood or OPIM 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 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. DOT and IATA training is currently offered by EHS. If assistance is needed for shipping of specimens, contact EHS.***

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### 3) Laboratory Equipment

#### *a. Centrifuge Use*

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

- Follow the appropriate 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.
- Do not attempt to operate the centrifuge while the door/lid is open.
- Before removing samples (particularly those that are infectious or potentially infectious), 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 disinfectant.

### ***b. Autoclave Use***

Autoclaves and sterilizers use steam, extreme heat (sometimes in excess of 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 on its operation.
- Prior to using an autoclave, any remaining items should 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.
- Autoclaves should never be overloaded.
- Follow the appropriate SOP for operating the autoclave.
- 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 will result in severe burns.
- If 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 of an individual.
- 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 to indicate all inspections, failures, and repairs.

## **MEDICAL WASTE AND DECONTAMINATION PROCEDURES**

### **1) 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 [Georgia Rule 391-3-4](#).***

## **2) 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 Centers for Disease Control (CDC) and the National Institutes of Health (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 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 update provides proper disinfection and disposal procedures for tissue culture wastes.

### 3) Chemical Decontamination

Work surfaces, reusable containers, and equipment used with human blood, OPIM, and other infectious agents 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 (1/10) with water, which is sufficient for the deactivation of BBPs.
- Household bleach loses its effectiveness over time; therefore it is important to make fresh 1/10 bleach solutions at least monthly ensure effective decontamination of surfaces. Preparing a fresh 1/10 solution is recommended to be used in the event of a spill of biohazardous materials.

**Note:** There are various [EPA registered disinfectants](#) that are effective against the most common pathogens.

### 4) Lab Attire and Laundry

Lab 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 agents are manipulated/processed. Contaminated laboratory attire must be handled as follows:

- Disposable lab 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.
- Lab coats contaminated with human blood, OPIM, or other infectious agents 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 lab coats shall be picked up, laundered, and returned by a vendor approved by the University.
- Contaminated lab coats, uniforms, or other protective attire must not be laundered at a dry cleaning business or in employees' homes.

## MEDICAL SURVEILLANCE

### 1) Vaccinations

Employees with potential for exposure to BBPs and/or OPIM will be afforded the opportunity to receive Hepatitis B vaccination. The following accommodations shall be made in accordance with OSHA [29 CFR 1910.1030](#):

- 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 cannot be administered the vaccination for medical reasons
  - The employee has been tested for antibodies and immunity is confirmed
- In the event that an employee declines the vaccination for any reason, s/he must sign a written statement confirming her/his declination.
- In the event that an employee who has potential workplace exposure initially declines to have Hepatitis B vaccine, but later decides to accept the vaccination, the vaccination shall be made available at that time.

### 2) Post Exposure Evaluation and Follow-Up

The following accommodations shall be provided for any employee after s/he has reported an occupational exposure to human blood, or OPIM:

- KSU will provide each exposed employee the opportunity to have a confidential medical evaluation and follow-up consultation which shall 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 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, his/her blood shall be tested as soon as possible to determine HBV and HIV infectivity. If consent cannot be obtained, KSU shall establish that

legally required consent cannot be obtained. When the source individual's consent is not required by law, his/her blood, if available, shall be tested and the results shall be documented.

- If the source individual is already known to be infected with HBV or HIV, then testing of his/her blood will not be required.
- The results of the source individual's tests shall be made available to the exposed individual, and he/she shall 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 United States Public Health Service (USPHS).
- Counseling shall be made available regarding reduction of risk and the risks and benefits of HIV 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), and
  - All medical records relevant to the appropriate treatment of the employee, including vaccination status, maintained by KSU.
- For each exposure evaluation, KSU shall obtain and provide exposed individuals with a copy of the evaluating health care professional's written opinion within 15 working days. The written opinion will be limited to the following information:
- Healthcare professionals' written opinions shall 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 shall be kept confidential, and not included in the statement, but will be available to the employee and/or his representative in accordance with HIPAA laws.

## INFORMATION AND TRAINING

### 1) Training

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

- Training will be provided 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 shall be provided as a result of modifications to work practices and/or 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 (classroom model)
  - Computer based training (online model)
  - Training manuals
  - Through media sources such as videos or newsletter articles published by EHS



## 2) 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 Laboratory Supervisor must ensure that 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 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.

## 3) Signage and Postings

All work areas where biological agents are used or stored must be posted with the appropriate hazard/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, etc.),
  - Containers used to transport human blood, OPIM, and/or other infectious materials
  - Laundry bags used for collecting contaminated lab coats or other protective clothing.

**Note: Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use 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 (BSL1, BSL2, etc.)

## EMERGENCY PROCEDURE

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

### 1) Exposure to BBPs or OPIM

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

- Immediately wash the affected area
  - For ocular 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.
- 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 has occurred.
- After immediate care has been administered, the exposed individual should follow up with a medical professional for post exposure follow-up.

### 2) Spill Procedures

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

- All spills must be immediately contained and cleaned by trained employees.
- 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.

### 3) Incident Reporting

All incidents, including accidents, injuries, and near misses involving human blood, BBPs, or OPIM must be promptly reported to the Laboratory Safety Manager. 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 shall be reported in accordance with the University process for [Incident Reporting and Investigating](#) (EOSM-108). The incidents should be reported using the appropriate [incident reporting form from the EHS website](#).
- All incidents must be reported to the PI/Lab Supervisor and to the Director of EHS or the Biosafety officer 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.

## RECORD KEEPING

### 1) Sharps Injury Log

KSU shall 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 shall 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, and
- An explanation of how the incident occurred

***Note: All information recorded in the sharps injury log shall be kept in a manner as to maintain confidentiality.***

### 2) 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. – social security number, 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, and
- 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, in accordance with this same standard, shall 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, and
- Maintained for at least the duration of employment plus 30 years

### 3) Training Records

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

***Note: Training records shall be kept for 3 years from the date on which the training occurred.***

### 4) 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.

### Revision History

Version #	Implemented By	Revision Date	Approved By	Approval Date	Summary of Changes
2.0	Rodrick Esaw	10/18/2016	EHS	10/18/2016	Revision to scope and work practices to include all affected KSU employees, addition of employee exposure determination, removal of appendix forms, removal of transportation section, formatting changes.

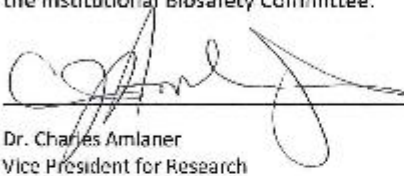


The University Office of Research

**Bloodborne Pathogens Exposure Control Plan**

**EOSMS-215 Rev 3.0 effective date 2/1/17**

By signing below, I hereby certify that the above document has been reviewed and approved by the Institutional Biosafety Committee.

  
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Dr. Charles Amlaner  
Vice President for Research

1/17/17  
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Date

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