Standard Operating Procedure (SOP) / Biosafety Protocol

Study Title:	
Principal Investigator:	
Investigational Product:	
Site:	

Table of Contents

Contents

1.0 Hazard Communication Statement

1.1 The Investigational Product:

Please provide a general description of the investigational product, including any genetic alterations:

1.2 Risk Associated with the Investigational Product:

Please provide a description of the risks associated with the investigational product, in regard to exposures to personnel or release into the environment:

2.0 Standard Biological Safety Practices

Investigators are recommended to follow prudent standard biological safety practices and precautions when handling infectious human specimens in clinical laboratories. The following precautions are adapted from the NIH and CDC publication, Biosafety in Microbiological and Biomedical Laboratories, 6th ed.,:

A) Good laboratory Practices:

1) Access to areas containing the investigational product is limited or restricted by the Principal Investigator.
2) Persons must wash their hands after working with potentially hazardous materials and before leaving the room where they are utilized.
3) Gloves should not be worn in hallways or common areas outside of laboratory designated for work.
4) Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption must not be permitted in areas containing the investigational product. Food must be stored outside of these areas in cabinets or refrigerators designated and used for that purpose.
5) Mouth pipetting is prohibited; mechanical pipetting devices must be used.
6) Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented. Whenever practical, supervisors should adopt improved engineering and work practice controls that reduce risk of sharps injuries. Precautions, including those listed below, must always be taken with sharp items. These include:
    a) Careful management of needles and other sharps are of primary importance. Needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal.
    b) Used disposable needles and syringes must be carefully placed in conveniently located puncture-resistant containers used for sharps disposal.

c) Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.

d) Broken glassware must not be handled directly. Instead, it must be removed using a brush and dustpan, tongs, or forceps. Plastic ware should be substituted for glassware whenever possible.

7) Perform all procedures to minimize the creation of splashes and/or aerosols.

8) Work surfaces should be covered with absorbent sheets to collect splashes and drips to minimize the spread of contamination.

9) Decontaminate work surfaces after completion of work and after any spill or splash of potentially infectious material with appropriate disinfectant.

10) Decontaminate all cultures, stocks, and other potentially infectious materials before disposal using an effective method. Depending on where the decontamination will be performed, the following methods should be used prior to transport:

a) Materials to be decontaminated outside of the immediate work area must be placed in a durable, leak proof container and secured for transport.

b) Materials to be removed from the facility for decontamination must be packed in accordance with applicable local, state, and federal regulations.

c) A sign incorporating the universal biohazard symbol must be posted at the entrance to the work area when infectious agents are present. Posted information must include: the biosafety level, supervisor's name (or other responsible personnel), telephone number, agent information should be posted in accordance with the institutional policy.

11) An effective integrated pest management program is required.

12) The supervisor must ensure that study personnel receive appropriate training regarding their duties, the necessary precautions to prevent exposures, and exposure evaluation procedures. Study personnel must receive annual updates or additional training when procedural or policy changes occur. Personal health status may impact an individual's susceptibility to infection, ability to receive immunizations or prophylactic interventions. Therefore, all study personnel and particularly women of childbearing age should be provided with information regarding immune competence and conditions that may predispose them to infection. Individuals having these conditions should be encouraged to self-identify to the institution's healthcare provider for appropriate counseling and guidance.

B. Special Practices (BSL2):

1) All persons entering the area containing the investigational product must be advised of the potential hazards and meet specific entry/exit requirements. BSL2 signage should be posted on laboratory door with information about the pathogen.

2) Study personnel must be provided medical surveillance, as appropriate, and offered available immunizations for agents handled or potentially present. For UAB campus employees, that surveillance is achieved through enrollment in Employee Health.

3) UAB currently does not collect and store serum samples from at-risk personnel involved in clinical trials.

4) A study specific biosafety manual (**this document**) must be prepared and adopted as policy. The biosafety manual must be available and accessible.

5) The supervisor must ensure that study personnel demonstrate proficiency in standard and special microbiological practices before working with BSL-2 agents.

6) Potentially infectious materials must be placed in a durable, leak proof container during collection, handling, processing, storage, or transport within a facility.

7) Potentially infectious substances should be labelled properly before storage.

8) Potentially infectious samples should be inactivated before moving out of facility for downstream processing.

9) Appropriate disinfectant to inactivate or decontaminate the biological agent should be prepared and used as per manufacturers recommendations.

10) Equipment should be routinely decontaminated, as well as, after spills, splashes, or other potential contamination.

    a) Spills involving infectious materials must be contained, decontaminated, and cleaned up by staff properly trained and equipped to work with infectious material.

    b) Equipment must be decontaminated before repair, maintenance, or removal from the work area.

11) Incidents that may result in exposure to infectious materials must be immediately evaluated and treated according to procedures described in the biosafety manual. All such incidents must be reported to the supervisor. Medical evaluation, surveillance, and treatment should be provided and appropriate records maintained.

12) Animal and plants not associated with the work being performed must not be permitted in the work area.

13) All procedures involving the manipulation of infectious materials that may generate an aerosol should be conducted within a biosafety cabinet (BSC) or other physical containment devices.

14) Investigators are recommended to keep a hard copy of SOP's that are used to manipulate infectious agent in the laboratory.

C. Safety Equipment (Primary Barriers and Personal Protective Equipment):

1) Properly maintained BSCs, other appropriate personal protective equipment, or other physical containment devices must be used whenever:

    a) Procedures with a potential for creating infectious aerosols or splashes are conducted. These may include pipetting, centrifuging, grinding, blending, shaking, mixing, sonicating, opening containers of infectious materials, inoculating animals intranasally, and harvesting infected tissues from animals or eggs.

    b) High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory using sealed rotor heads or centrifuge safety cups.

2) Protective laboratory coats, gowns, smocks, or uniforms designated for laboratory use must be worn while working with hazardous materials. Remove protective clothing before leaving the work area. Dispose of protective clothing appropriately, or deposit it for laundering by the institution. It is recommended that laboratory clothing not be taken home.

3) Eye and face protection (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials when the microorganisms must be handled outside the BSC or containment device. Eye and face protection must be disposed of with other contaminated waste or decontaminated before reuse. Persons who wear contact lenses in should also wear eye protection.

4) Gloves must be worn to protect hands from exposure to hazardous materials. Glove selection should be based on an appropriate risk assessment. Alternatives to latex gloves should be available. Gloves must not be worn outside the work area designated for infectious agents. In addition, BSL-2 workers should:

   a) Change gloves inside out when contaminated, glove integrity is compromised, or when otherwise necessary.

   b) Remove gloves and wash hands when work with hazardous materials has been completed and before leaving the work area.

   c) Do not wash or reuse disposable gloves. Dispose of used gloves with other contaminated waste. Hand washing protocols must be rigorously followed.

5) Respiratory Protection: Investigators should wear N-95 respirator to prevent exposure to infectious agents if recommended by regulations. Personnel must be medically evaluated, fit-tested, and trained prior to using respiratory protection. Contact Employee Health for more information.

D. Facilities (Secondary Barriers) Intended for Use with Infectious Agents

1) Doors should be self-closing and have locks in accordance with the institutional policies.

2) Work areas involving the investigational product must have a sink for hand washing. The sink may be manually, hands-free, or automatically operated. It should be located near the exit door.

3) The work area should be designed so that it can be easily cleaned and decontaminated. Carpets and rugs are not permitted in areas utilized in conjunction with infectious agents.

4) Furniture must be capable of supporting anticipated loads and uses. Spaces between benches, cabinets, and equipment should be accessible for cleaning.

   a) Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.

   b) Chairs in conjunction with infectious agents must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant.

5) Windows that open to the exterior are not recommended. However, if windows exist that open to the exterior, they must be fitted with screens.

6) BSCs must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. BSCs should be located away from doors, windows that can be opened, heavily traveled areas, and other possible airflow disruptions.

7) Vacuum lines should be protected with liquid disinfectant traps.

8) An eyewash station should be readily available. If an eye wash is not available, compensate with use of eye protection such as safety glasses or goggles when utilizing infectious agents.

9) There are no specific requirements for ventilation systems. However, planning of new facilities should consider mechanical ventilation systems that provide an inward flow of air without recirculation to spaces outside of the facility.

10) HEPA filtered exhaust air from a Class II BSC can be safely recirculation back into the facility if the cabinet is tested and certified at least annually and operated according to manufacturer ’s recommendations. BSCs can also be connected to the facility exhaust system by either a thimble (canopy) connection or directly exhausted to the outside through a hard connection. Provisions to assure proper safety cabinet performance and air system operation must be verified.

11) A method for decontaminating all wastes should be available in the facility (e.g., autoclave, chemical disinfection, incineration, or other validated decontamination method).

3.0 Safety Practices for Study Procedures

3.1 Receiving and storage:

Please describe how the IP will be stored:

- Building:
- Room:
- Fridge/Freezer/Cabinet:
- Primary containment (e.g., glass stoppered vials):
- Access Controls to IP (room / storage equipment):
- Signage: A biohazard placard will be displayed at the entrance to the rooms while the investigational product is stored, dispensed or administered. The placard will be provided by UAB Biosafety, if needed.
- PPE for unpacking:

3.2 Dispensing

The IP will be prepared and dispensed according to the protocol and Sponsor's instructions contained in the study Brochure and associated pharmacy SOPs.

Please describe how the IP will be dispensed:

- Building:
- Room:
- Signage: Biohazard (BSL-2)
- Describe dispensing methods:
  - PPE for dispensing
  - Biosafety Cabinet

3.3 Transport to Clinic Area

For transport, the IP will be packaged in a sealed, durable, leak-proof container with a biohazard label.

3.4 Administration

Please describe how the IP will be administered:

- Building:
- Room:
- Signage
- PPE for administration
- Signage: Biohazard (BSL-2)

3.5 Work Surface Disinfection

To disinfect surfaces, site specific procedures/protocols will be followed, or the surface will be wiped with a clean cloth dampened with an EPA-approved disinfectant/detergent or an approved germicidal wipe (such as 10% bleach).

Please describe the products used for routine surface disinfections, or in response to a spill:

Disinfectant used in pharmacy: Contact time:
Disinfectant used in clinic: Contact time:

3.6 Waste Disposal

The UAB Hospital Medical Waste Policy will be adhered to for all UAB-affiliated clinics. After the IP is administered, all contaminated items considered to be medical waste are stored in leak-proof red bags or sharps containers. Medical waste may also include unused IP. Sharps containers are disposable, leak-proof, and puncture resistance, and are located as near as feasible to all areas where contaminated needles and sharps are generated and may be found. The containers are red or labeled with biohazard symbol. Per UAB Biosafety policy, needles shall not be recapped, bent, sheared, broken, removed from disposable syringes or otherwise manipulated by hand prior to disposal.

Specify how the unused IP will be disposed:

Bags and containers of medical waste are closed prior to removal to prevent spillage during handling and transporting of waste. Disposal of all regulated waste is in accordance with State and Federal regulations. All hospital/clinical waste that has been designated for disposal in red bags will be collected by Stericycle and transported off site for processing.

Location for medical waste storage for Stericycle pick-up:

4.0 Incident Response Plan

Study personnel must be adequately trained to respond properly to potential incidents such as spills of the investigational product as well as occupational exposures (e.g. needle sticks) and environmental releases (spills outside the facility). Spills involving rDNA are of particular concern, not only from a safety standpoint, but from a regulatory standpoint. All spills shall be rectified, as discussed below, with the added procedure of reporting the incident to the Biosafety Officer (BSO).

4.1 Incident / Spill Response

Biohazard spills can potentially be a danger to human life. Therefore, taking the proper steps to contain and render the spill of harm is vital to preventing exposure. This section will discuss 3 types of spills.

1. Minor Spills Within the BSC (less than 10ml of infectious material)
2. Major Spills Within the BSC (more than 10ml of infectious material)
3. Spills Outside the BSC (any amount of infectious material)

MINOR SPILLS WITHIN THE BSC: If a spill occurs, while the BSC is running, double glove and decontaminate the spill with approved disinfectant (e.g. 10% bleach solution) allowing for a minimum 30-minute contact time. All absorbent material used to clean-up the spill will be discarded into a biohazard bag within the BSC and autoclaved.

MAJOR SPILLS WITHIN THE BSC: Aspirate the liquid using a pipette into a waste container within the BSC. Then follow the process of decontamination for minor spills. Contact EH&S Biosafety at biosafety@uab.edu for consultation or help with larger spills.

SPILLS OUTSIDE THE BSC (PRIMARY CONTAINMENT): Spills that occur outside primary containment are urgent, due to the risk of aerosols. Individuals are to notify all staff within the lab and evacuate immediately discarding contaminated PPE and/or clothes into a biohazard barrel (utilizing the emergency shower and eyewash station if necessary). Users will follow their incident response procedures and contact EHS for further instructions.

EXPOSURE RESPONSE: Incidents resulting in droplet exposure to mucous membranes (eyes, nose or mouth) or other areas of the body will be rinsed with water for 15 minutes using the appropriate washing station (e.g. lab sink, eyewash, safety shower). In the event of a stick and/or cut with contaminated sharps, personnel will wash the affected area with soap and water for 15 minutes.

4.2 Incident Reporting

All exposed (or potentially exposed) personnel will report the incident to the Principle Investigator (PI), Human Resources (OJI), and to the EH&S Biosafety Officer. Any exposures to human materials potentially contaminated with BBP should be followed up immediately to Employee Health. See “Table I Reporting Contacts,” below, and “Appendix I UAB Exposure Response Flowchart” at the end of this document for instructions and contact information.

Researchers must be made aware that all spills and accidents, even if relatively minor, require reporting. Any significant problems, violations, or any significant research-related accidents and illnesses must be also reported to the UAB Institutional Biosafety Committee (IBC) and the National Institutes of Health Office of Science Policy (NIH OSP) at NIHGuidelines@od.nih.gov within 30 days. Medical evaluation, surveillance, and treatment are provided, as appropriate, and written records are maintained. Spills and accidents which result in overt exposures to Risk group 2 or higher organisms, or organisms containing recombinant or synthetic DNA, must be immediately reported to the PI, the BSO, the IBC, and the OSP.

Table I. Reporting Contacts

Contact	Name	Primary	Secondary
Principal Investigator			
UAB EHS		205-934-2487	
UAB Dir-Research Safety	Justin Roth	205-934-7488	205-276-5063
UAB Responsible Official	Brian LaGory	205-996-0119	
UAB Employee Health (Bloodborne pathogen exposures)	Needlestick Team	205-934-3411 Ask for “needlestick team”	

5.0 Training Guidelines

The standards for performing research involving genetic engineering or gene therapy are codified in *NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules* (NIH Guidelines). NIH Guidelines are promulgated by the NIH Office of Science Policy (OSP) and call for oversight of genetic engineering and gene therapy research at the site level by Institutional Biosafety Committees (IBCs). NIH Guidelines places the responsibility for supervision of research personnel on the Principal Investigator. The PI is responsible for ensuring personnel are aware of the risks associated with the research as well as the pertinent safety practices for the safe conduct of research. The PI must ensure personnel have the appropriate training, personal protective equipment (PPE) and safety equipment. The PI is

responsible for ensuring research personnel are aware of how to respond to incidents such as exposures, spills or violations of NIH Guidelines and report them to the PI and the IBC.

Course Title:	Course ID in Campus LMS:	Frequency:
Basic Biosafety	ID: E-5VNQVM	Once
Bloodborne Pathogen Training	ID: E-E04XR0	Annually
Medical Waste Management for Labs	ID: E-7VR7VE	Every 3 yrs, or earlier, if regulations change
NIH Guidelines - Recombinant or Synthetic Nucleic Acid Molecules	ID: E-G0381J	Once
Shipping with Dry Ice	ID: E-P0WZ0J	Every 2 yrs, or earlier, if regulations change
Shipping Biological Substances, Category B • Includes Exempt Human Specimens	ID: E-E1LZV4	Every 2 yrs, or earlier, if regulations change
Shipping Infectious Substances, Category A	ID: E-71KDVJ	Every 2 yrs, or earlier, if regulations change

6.0 References

Provide any references cited in the safety protocol / SOP such as the study protocol, safety data sheets or medical journal articles.

Laboratory Biosafety Level Criteria, Biosafety in Microbiological and Biomedical Laboratories, Ed. 6th., Centers for Disease Control and Prevention and the National Institutes of Health

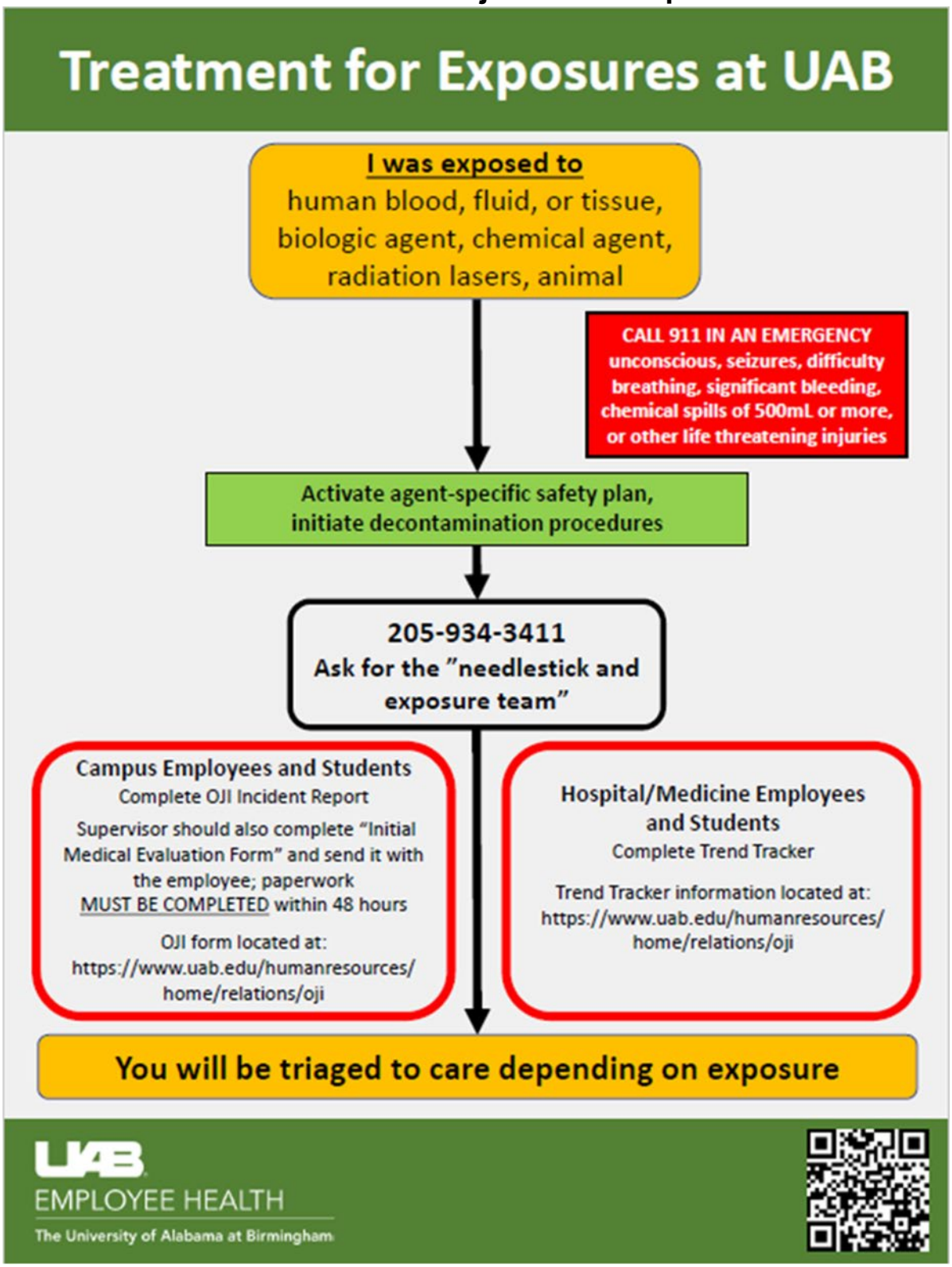
NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules. National Institutes of Health

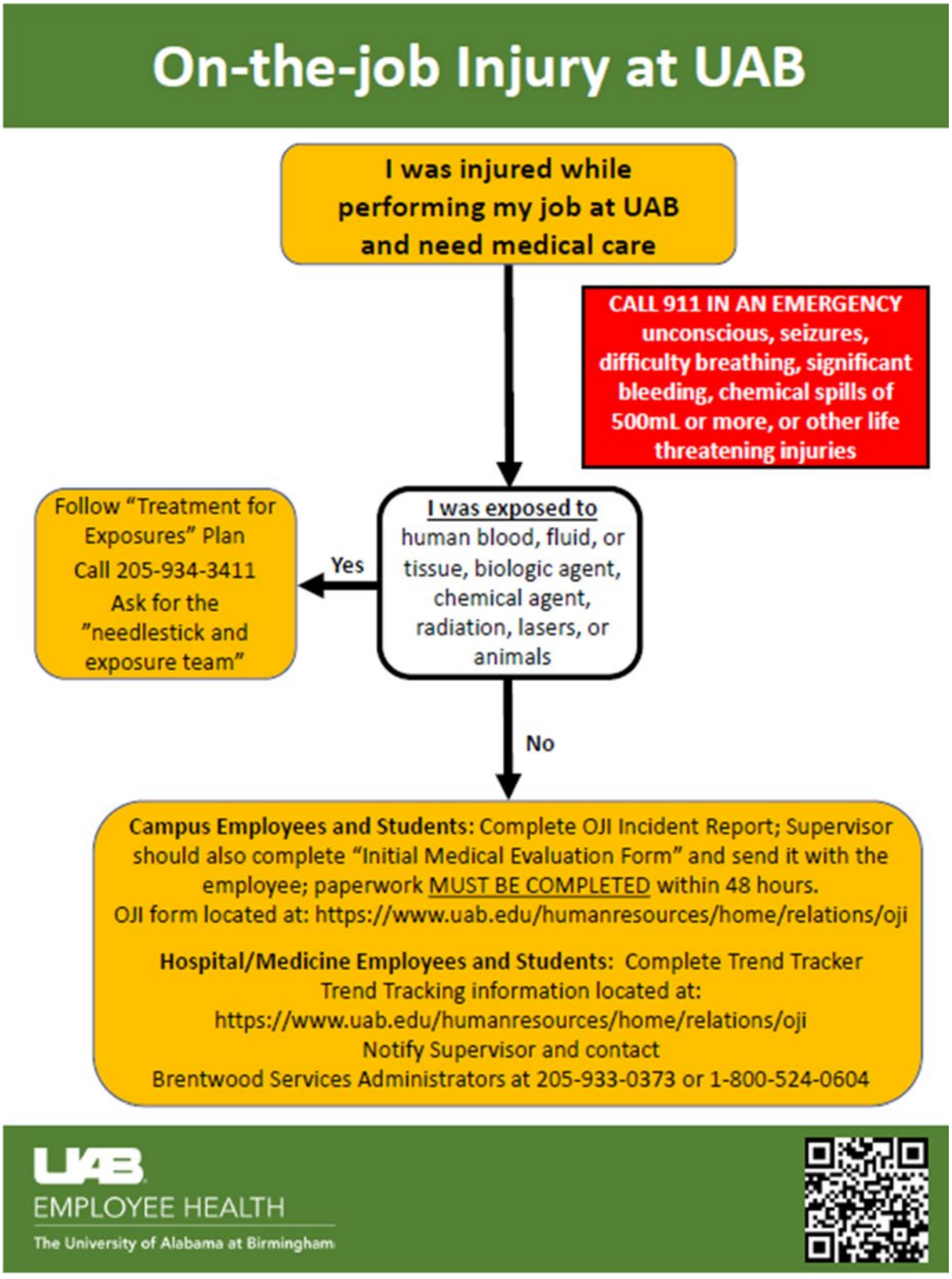
7.0 Signatures of Study Personnel

The study personnel signing below attest to having read the safety protocol, completed the listed training, and will follow the precautions described therein. This includes study personnel who handle, transport, administer or dispose of the investigational product.

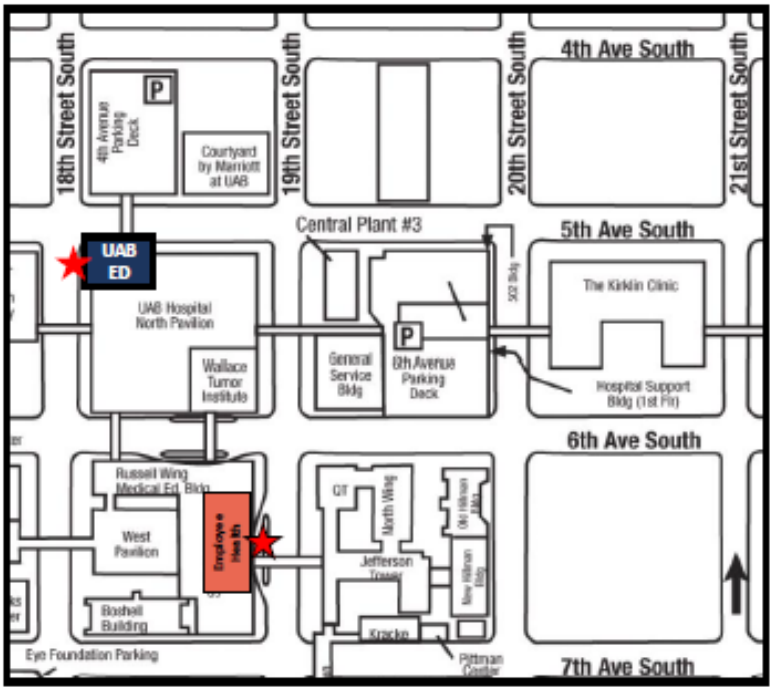
NAME	SIGNATURE	DATE

Treatment Providers for Injuries and Exposures at UAB




On-the-job Injury at UAB
I was injured while performing my job at UAB and need medical care
CALL 911 IN AN EMERGENCY unconscious, seizures, difficulty breathing, significant bleeding, chemical spills of 500mL or more, or other life threatening injuries
I was exposed to human blood, fluid, or tissue, biologic agent, chemical agent, radiation, lasers, or animals
Yes
Follow "Treatment for Exposures" Plan
Call 205-934-3411
Ask for the "needlestick and exposure team"
No
Campus Employees and Students: Complete OJI Incident Report; Supervisor should also complete "Initial Medical Evaluation Form" and send it with the employee; paperwork MUST BE COMPLETED within 48 hours.
OJI form located at: https://www.uab.edu/humanresources/home/relations/oji
Hospital/Medicine Employees and Students: Complete Trend Tracker
Trend Tracking information located at:
https://www.uab.edu/humanresources/home/relations/oji
Notify Supervisor and contact
Brentwood Services Administrators at 205-933-0373 or 1-800-524-0604
UAB
EMPLOYEE HEALTH
The University of Alabama at Birmingham

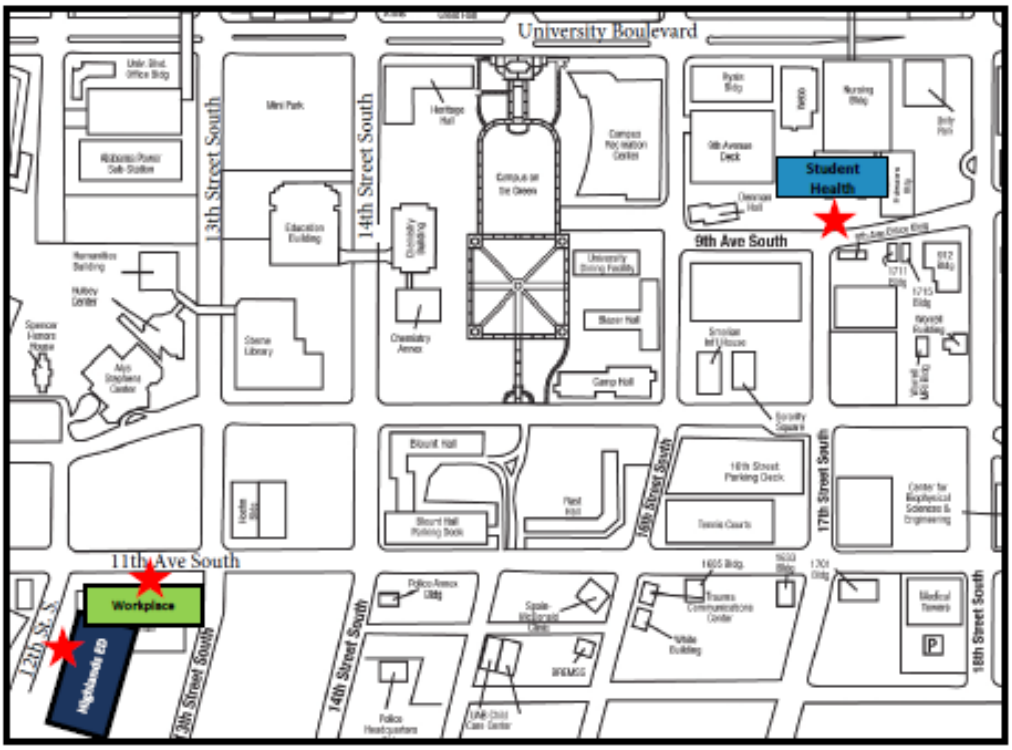
Treatment Provider Locations for Injuries and Exposures at UAB



University ED:
Highlands ED: 1201 11th Ave S
*enter on 12th St S
(205)934-3411

Employee Health:
Spain Wallace SW123
620 19th St. S.
6:30am-5pm: (205)934-3675

Rapid Response Team:
(after hours/weekends)
(205)934-4011
Ask for Employee Health nurse on call



Highlands ED:
Highlands ED: 1201 11th Ave S
*enter on 12th St S
(205)934-3411

Workplace Clinic:
1201 11th Ave S
7:30am-4pm
(205)930-7007

Student Health
1714 9th Ave S
M-F, 8am-5pm (205)934-3580
After hours: (205)934-3411
Ask for on-call provider

BIOHAZARD

BSL-2 LABORATORY

AGENTS IN USE:
ENTRY REQUIREMENTS: