BIOSAFETY LEVEL 2 (BSL-2) LABORATORY MANUAL

Contact Information

Name	Role(s)	Office number	Cell number
(add PI here)	XX	XX	XX
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Tom Schultz	Biosafety Officer	989-774-3279	989 330-4660

Table of Contents

1. Introduction

What is Biosafety?

Measures used when handling biohazardous materials to avoid harm to oneself or the environment.

What is a Biohazard?

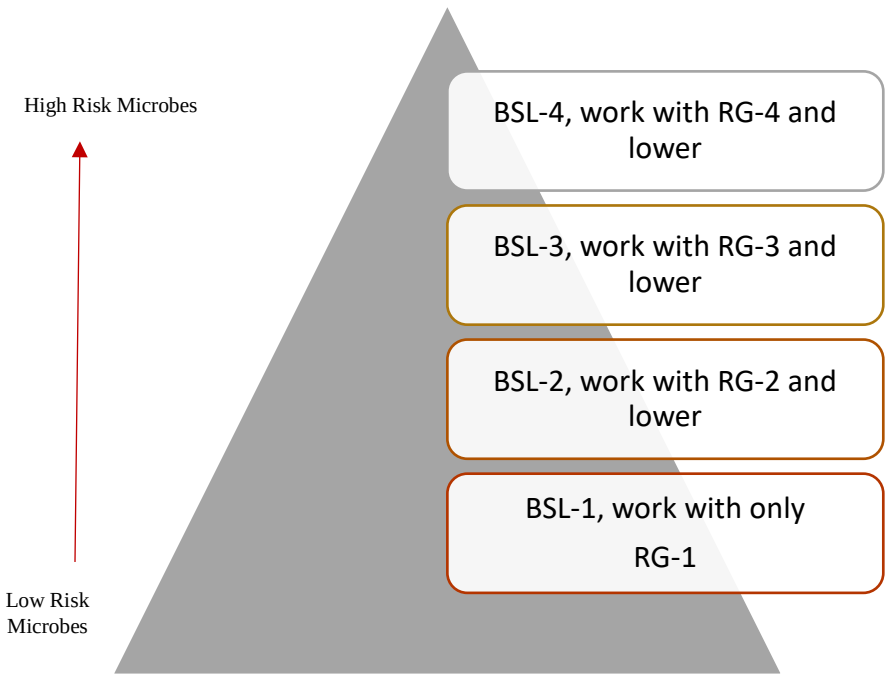
A potential hazard to humans, animals or the environment caused by a biological organism or by material produced by such an organism

Examples:

- Viruses, bacteria, fungi, parasites and their toxins/allergens
- Blood and body fluids, cell lines and tissues from humans and animals
- Organisms that have been genetically modified

Risk Groups (RG) - 4 levels

Defines the agent in use and may be a starting point for risk assessment and assignment of Biosafety Levels (BSL).



RG-1- **Are not associated** with disease in healthy adult humans or animals.

RG-2- **Are associated** with diseases that are rarely serious and for which preventatives or therapeutics are often available.

RG-3- **Are associated** with serious or lethal human disease for which preventatives or therapeutics may be available.

RG-4 **-Are associated** with potentially lethal human disease for which preventatives or therapeutics are not readily available.

*Exceptions may be made based on risk assessment

Biosafety Levels (BSL) - 4 levels

Biosafety level defines lab requirements, protective clothing and work practices based on a risk assessment and the agent in use.

BSL-1 Basic	**BSL-2 Basic**	**BSL-3 Containment**	**BSL-4 Maximum Containment**
Practices unlikely to cause disease in healthy human adults.	Practices are of moderate potential to cause human disease or environmental damage.	Work with exotic or indigenous agents that may cause serious harm or potentially lethal disease if exposed.	Work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections and life-threatening disease.
• No eating or drinking • No special design features • Work can be done on open benchtop • Safe handling of sharps • Decontamination of work surfaces • Decontaminating material before disposal • Washing hands before leaving	Requires BSL1 requirements plus: • Biological safety cabinet (BSC) if any potential for generation of aerosols exists • Standard operating procedures for handling spills and potential exposures • Controlled access to lab when in use • Written biosafety/emergency procedures • Personnel made aware of hazards	Requires: BSL 2 requirements plus: • Specialized containment laboratory • HEPA filtration recommended • Equipment redundancy • Specialized training/Respiratory Protection • Autoclave in lab for sterilizing waste • All procedures with active agents in BSC • Directional airflow	Requires: BSL3 Requirements Plus • Class III biosafety cabinets (glove boxes) (not a requirement to have a class III cabinet in a BSL-4 suit lab) • Autoclave in lab • Decontamination shower/change rooms • Airlocks/Anteroom • HEPA filtered single pass lab facility
PPE: Lab coat, gloves, eye protection when hazard exists	**PPE:** Protective lab coats, eye and face protection if splash or spray hazard exist, gloves and respiratory protection if determined by risk assessment	**PPE:** Solid front protective lab clothing, eye and face protection if potential for splash or spray, gloves and respiratory protection if inhalation hazard exist	**PPE:** Positive pressure suits (“moon suits”)
Examples: K-12 *E. coli* strains, yeast, *Bacillus subtilis*	**Examples:** Salmonella, Hepatitis, Herpes simplex, Clinical, research and teaching laboratories with RG2 agents, human cell culture work, recombinant DNA work, viral vectors	**Examples:** *Mycobacterium tuberculosis, Hantaviruses, H5N1 strains, prions*	**Examples:** Ebola, Marburg, Lassa, other hemorrhagic fever viruses

2. Standard Microbiological Practices

Reminder! BIOSAFETY LEVEL vs RISK GROUP

NOTES: Risk groups (RG) relate to but do not equate to the biosafety level (BSL) of laboratories designed to work with organisms in each RG.

- Access to the laboratory is limited or restricted at the discretion of the Facility Director when experiments are in progress.
- Persons wash their hands after handling infectious materials and animals, after removing gloves, and when they leave the laboratory.
- Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in the laboratory. Persons who wear contact lenses in laboratories should also wear goggles or a face shield. Food is stored outside the work area in cabinets or refrigerators designated for this purpose only.
- Mouth pipetting is prohibited; mechanical pipetting devices are used.
- Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented. Whenever practical, laboratory 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:
- 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.
- Used disposable needles and syringes must be carefully placed in conveniently located puncture-resistant containers used for sharps disposal.
- Non-disposable sharps must be placed in a hard walled container for transport to a processing area for decontamination, preferably by autoclaving.
- 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.
- All procedures are performed carefully to minimize the creation of aerosols.
- Work surfaces are decontaminated at least once a day and after any spill of viable material.
- All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method, such as autoclaving. Materials to be decontaminated outside of the immediate laboratory are to be placed in a durable, leak-proof container and closed for transport from the laboratory. Materials to be decontaminated off-site from the laboratory are packaged in accordance with applicable local, state, and federal regulations, before removal from the facility.
- When infectious materials are present in the laboratory or containment module, a hazard warning sign, incorporating the universal biohazard symbol, is posted on all laboratory access doors. The hazard warning sign lists the name and telephone

number of the Facility Director or other responsible person(s), and indicates any special requirements for entering the laboratory, such as the need for immunizations, respirators, or other personal protective measures.

- An insect and rodent control program is in effect.
- Laboratory personnel receive appropriate training on the potential hazards associated with the work involved, the necessary precautions to prevent exposures, and the exposure evaluation procedures. Personnel receive annual updates, or additional training as necessary for procedural changes.

3. Exposure Control

a) Administration

- Principal Investigator and Biosafety officer performs a risk assessment prior to operations
- Register work with: Office of Research Compliance
  - https://www.cmich.edu/office_provost/ORGS/ComplianceandResearchIntegrity/InstitutionalBiosafetyCommittee/Pages/default.aspx
- Biosafety Manual/Standard Operating Procedures
- Safety Data Sheets available
- CITI training for BSL2 or higher practices
  - https://www.cmich.edu/office_provost/ORGS/ComplianceandResearchIntegrity/Pages/IRB-Training.aspx
- BBP training required for human tissues, cell lines, blood, bodily fluids, or other potentially pathogenic materials.
  - https://www.cmich.edu/fas/fsr/rm/EHS/Training/Pages/Online-Training.aspx#BBP
- Biosafety Training document required for all personnel See Appendix B

b) Primary Containment

- Approved lab facility/directional airflow
- Biosafety Cabinet (BSC) (See Appendix A)
  - Primary containment for biological agents/aerosols
  - Do not restrict the airflow of the cabinet
  - Do not use volatile chemicals unless ducted outside the lab
  - Do not use flames in the BSC
  - Training Exam Required See Appendix A
  - Procedures with a potential for creating infectious aerosols or splashes must be conducted in the BSC

a) Practices and procedures

- No food or drink in any lab
- Appropriate attire and behavior
- Aseptic techniques

- Good laboratory practices
- Sharps Protocols
- Labeling/safety data sheets
- Knowledge/training/SOPs

a) Personal Protective Equipment

- Nitrile gloves
- Lab coat/apron
- Eye protection
- Closed Toe Shoes
- Heat gloves for autoclave

4. Biohazards

a) Bloodborne Pathogens (BBP)

Pathogenic microorganisms that may be present in human blood, fluids, tissues and cells and can cause disease in humans. Examples of Potential Pathogens: Hepatitis B and C, HIV.	**Protection**: • BBP training/exposure control/sharps • Vaccination option if available • Aseptic technique & good lab practices • PPE/Barriers • Hand washing

b) Cell Culture/Recombinant DNA/Viral Vectors

Genetic engineering routinely involves in vitro incorporation of non-native genetic material into cells that may be of human origin. Adenovirus, herpes virus, retrovirus, lentiviruses transgenes, cell lines.	**Protection**: • Aseptic techniques/GLP/aerosol control • BSC use for viruses and human cell lines • Disinfection of surfaces • Sharps protocols/safety sharps if available • PPE/Barriers • Hand Hygiene: o Upon entering and leaving the lab o Before and after cell culture work o Before touching an unprotected part of your body o As needed

5. Sharps

Includes needles, syringes, razor blades, cover slips, slides, scalpels, glass, broken plastic & glassware or other devices capable of cutting or piercing skin.

- Glass or Pasteur pipettes are considered glass sharps and should be placed be placed in a cardboard box or suitable rigid container.
- Approved plastic biohazard sharps container must be used for needles, syringes, razor blades, & scalpel blades
- Waste must be discarded within 90 days.

6. Biohazard Waste

TWO TYPES OF BIOLOGICAL WASTE

SOLID WASTE

Contain waste in an autoclave bag and place in an autoclavable tub.

Use indicator tape or biological indicators periodically to validate waste cycles.

Waste should be autoclaved for at least 45 minutes.

LIQUID WASTE

Treat with 10% bleach for 30 minutes or use other validated decontamination procedures.

Dispose to sanitary sewer as long as no heavy metals, solvents, alcohols or chemotherapeutics, or any other hazardous waste is in use.

Once appropriately autoclaved, biohazard waste is no longer considered hazardous and can be disposed of in the dumpster or liquids in the sanitary sewer.

- All decontaminated red biohazard bags are placed in a black trash bag prior to disposal.
- Animal carcasses and pathological waste must be removed by a licensed waste hauler and incinerated.
- Waste must be stored so it does not putrefy.
- Biohazard waste containers must be closed when not in use.
- Dispose of noninfectious waste in regular trash.

7. Autoclave

Uses: Sterilize glassware, equipment and media. Decontamination of used cultures, stocks and media, laboratory and regulated medical waste. • Get proper training from PI. • Watch ASU video and take exam • Wear heat resistant PPE and eye protection • Use only approved autoclave bags • Do not overfill bags • Do not autoclave bleach, volatiles, solvents or corrosives	**Protection**: • Awareness of scalding liquids and hot surfaces • Stand back and open door slowly • Do not agitate liquids • Wear PPE

8. Other:

- **Be Smart, Be Safe!**
- Carefully plan out all procedures and experiments
- Notify other users of unsafe practices before they hurt themselves or others
- Contact a facility manager if there is a dangerous situation
- Don’t be afraid to ask for help

In case of life threatening emergency:

Call 911

Other Emergencies

Call emergency contact numbers listed on door signs or the biosafety manual.

Reporting

In the event of any accidents, incidents or spills please let lab supervisors, the Office of Research Compliance or the BSO know immediately

Appendices

Appendix A Standard Operating Procedures

Standard Operating Procedure-
Spill Response and Clean-up Outside Biosafety Cabinet

BIOLOGICAL SPILL KIT

In a 5 gallon bucket with lid, place the following items:

- Spill response and cleanup procedures (SOP)
- 1 Notepad
- 1 Pen
- 1 Permanent marker
- 1 trash bag
- 6 Biohazard stickers
- 1 roll duct tape
- 1 roll/pack absorbent paper towels
- 4 Absorbent pads (each holds 500ml)
- 1 Small sharps container
- 4 Biohazard waste bags and closures
- 1 hand broom with dustpan
- 1 squeegee
- 1 pair tongs
- Antibacterial soap
- Hand sanitizer
- 250 ml concentrated bleach less than 1 year old
- 1 Spray bottle with distilled water to mix bleach solution
- 6 pair nitrile gloves
- 2 Disposable waterproof apron
- 3 pair disposable shoe covers
- Splash goggles
- 2 N-95 respirators
    - (NOTE: medical clearance & fit-testing required for respirator use)*

Assemble the materials listed above in the biological spill kit before taking action. After the 30 minute evacuation period clean up the spill as soon as possible.

RESPONSE

- REMAIN CALM!
- Alert people who are in the immediate area there has been a spill
- Remove contaminated clothing as you leave the area (evacuate)
- Also try to isolate the spill as much as possible by closing doors, etc., if it does not delay your evacuation.
- Immediately wash your hands and any exposed areas with soap and warm water
- Post a “DO NOT ENTER” sign outside the spill area and restrict access
- Allow aerosols to settle (~30 minutes)
- Evaluate the agent’s specific hazards
- Contact emergency services and the Biological Safety Officer for assistance
- Seek medical treatment if warranted*

SPILL CLEAN-UP

- Assess the extent of the spill and formulate a plan for decontamination
- Assemble a spill response kit and clean-up team
- Put on gowns, gloves (double if needed), shoe covers, and appropriate personal protective equipment from spill kit.
- Starting at the perimeter of the spill and working toward the center, cover the spill with paper towels or other absorbent material.
- Slowly pour disinfectant over the absorbent material being careful to avoid splashing and spill starting around the edges and working toward the center. Saturate the area with the disinfectant.
- Allow sufficient contact time for the disinfectant to inactivate biohazardous agents; typically 15-20 minutes, but double the contact time for viscous materials or body fluid.
- Use a squeegee and paper towels to wipe up the spill, working from the edges to the center.
- Use tongs/forceps/dust pan to pick up sharp objects (broken glass, etc.) that may puncture gloves.
- Discard absorbent material used to clean-up the spill in biohazard waste bag. Use a bucket for large sharp objects or saturated absorbent materials.
- Clean the the spill area again using with fresh paper towels soaked in disinfectant. Thoroughly wet the spill area and allow to disinfect for approximately 15-20 minutes.
- Discard cleanup materials in biohazard bag, along with any contaminated PPE.
- Any re-useable and autoclavable materials that are contaminated sould be placed in a separate bag or autoclavable container for sterilization.
- Close and secure bag, then place bag in second biohazard bag. Secure outer bag and disinfect by autoclaving (steam sterilization).

Standard Operating Procedure-
Spill Response and Clean-up Outside Biosafety Cabinet

DO NOT TURN OFF THE BSC!

Have a complete biological spill kit ready to go before you start the clean-up. Initiate clean-up as soon as possible. Allow cabinet to operate during clean-up.

RESPONSE

- REMAIN CALM!
- Alert people in the immediate area of spill
- Remove contaminated clothing
- Identify the agent's specific hazards

SPILL CLEAN-UP ROUTINE PROCEDURES

- Use tongs/forceps to pick up sharp objects (broken glass, etc.) that may puncture gloves.

- Starting at the perimeter and working toward the center of the spill, cover the spill with paper towels or other absorbent material.

- Carefully pour disinfectant over the absorbent material and spill starting around the edges and working toward the center. Saturate the area with the disinfectant.

- Allow sufficient contact time typically 15-20 minutes and double the contact time for body fluids or viscous substances.

- Wipe up spill with a squeegee and/or paper towels, working from edge to center.

- Re-disinfect the spill area with fresh paper towels soaked in appropriate disinfectant. Wipe down all reachable cabinet surfaces with disinfectant.

- Place disposable contaminated materials into a biohazard bag and autoclave.

- Place contaminated reusable items in biohazard bags or heat resistant pans or containers with lids before autoclaving and further clean-up.

- Expose non-autoclavable materials to disinfectant, 20 minutes contact time, before
  removing them from the BSC.

- Remove protective clothing used during clean-up and place in biohazard bag for autoclaving.

- The cabinet should be run 15 minutes after clean-up before resuming work or turning off the cabinet.

- Inform all users of the BSC as well as the laboratory supervisor/principal investigator about the spill and successful clean-up as soon as possible.

Notes: Medical evaluation, surveillance, and treatment are provided as appropriate, and written records are maintained.

BIOLOGICAL SPILL KIT

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- 1 pair tongs
- Antibacterial soap
- Hand sanitizer
- 250 ml concentrated bleach less than 1 year old
- 1 Spray bottle with distilled water to mix bleach solution
- 6 pair nitrile gloves
- 2 Disposable waterproof apron
- 3 pair disposable shoe covers
- Splash goggles
- 2 N-95 respirators
    - (NOTE: medical clearance & fit-testing required for respirator use)*

Standard Operating Procedure
Processing Biohazardous Regulated Medical Waste in Biosciences

Things not processed in BC1037:

Chemical waste, Radioactive Waste, Animal Waste, Sharps. These materials are picked up and disposed of through a licensed waste disposal vendor.

Autoclave training
https://www.youtube.com/watch?v=rM_JTgLSKXk&feature=youtu.be

Complete Biosafety training form signed by your supervisor and give to the BSO

Supply List: (please return all used items this room)

- Biohazard Waste Bin
- Autoclaved Waste Cart
- Auxiliary Biohazard Bin
- Large Nalgene Autoclavable Tubs (6)
- Small Nalgene Autoclavable Tubs (6)
- Supply Cart
- Supply Shelf
- Biohazard Bags/twist ties
- Waste Tags and Wires
- Autoclave Gloves
- Waterproof Gloves
- Nitrile Gloves (M-L)
- Disposable aprons
- Safety glasses

- Autoclave tape
- Sharpies
- Black Opaque Trash Bags
- Disinfecting wipes
- Disinfectant spray
- Bleach
- Paper towel
- Plunger
- Spatula
- Dust pan/Broom
- Squeegee
- Logbook and pen

Wear Appropriate Personal Protective Equipment (PPE)

For unsterilized waste:

Lab Coat/Apron

Eye protection

Nitrile gloves

Shoes

For Autoclaved waste:

Lab Coat/Apron + long sleeves

Eye protection

Heat resistant gloves

LabelingLaboratory RegulatedMedicalWaste

Fill out the Biohazard waste tag with a Sharpie and secure to the bag with a twist tie or wire. The label should include:

- Your Name
- Lab room #
- Date
- Description of waste
- Cycle number

(Refer to the example provided)

Processing Biohazard Waste

- Place tagged and unsterilized waste in the Red Biohazard Waste bin to be sterilized or the auxiliary biohazard bin (small bin with no wheels) if the large wheeled bin is full.

- If the red bins are full please run a waste cycle if you have been trained on using the autoclave and processing the waste or please report full waste bins to Tom Schultz (Biosafety Officer (BSO)) @ 989 774-3279, schul1te@cmich.edu.

- The autoclave cycle for waste will run for 45 minutes and tested periodically with biological indicators by the BSO to validate removal of viable agents.

- Be sure the waste bag is contained in a Nalgene autoclave tub before placing it in the autoclave.

- If the majority of the waste material is “dry”, be sure to not seal the bag tightly or add ½ liter of water to the bag before sealing to assure steam penetration/generation.

- Tubs are to be placed on the large rolling autoclave rack. Roll the rack to the front of the autoclave and be sure the pins align with the slots inside the autoclave. The rack with the tubs can then be rolled into the autoclave.

- Close the door, start the waste cycle and fill out the logbook provided.

- After the cycle is complete and wearing heat protective PPE, roll out the autoclave rack, place a “STERILE & HOT” sign on the tubs and allow the bags to cool. Released agar will solidify in the Nalgene tub and will quickly grow microbes so be sure discard as soon as it has cooled.

- Write the cycle number on all the waste tags for the sterilized waste.

- After the waste cools, place the sterilized red bag inside a black opaque garbage bag. Any agar that has solidified should be scooped out of the tub using a dust pan or spatula and placed into the black trash bag with the waste bag. Place the sealed black bags in the rolling cube truck to go to the dumpster.

- Rinse the spatula, dust pans and autoclave tubs thoroughly and store so they will dry. Molten agar in the sink must be flushed by running hot water in the drain a minimum of 5 minutes so it does not solidify in the drains.

- Remember the processed materials often contain nutrients that grow bacteria and fungi. If they have water they will rapidly putrefy.

- CLEAN UP! Thank you.

Appendix B-
Biosafety Training Autoclave Safety

Autoclave Training 20 Minute Video from Arizona State University

https://www.youtube.com/watch?v=rM_JTgLSKXk&feature=youtu.be

Circle the best response

1. **T or F** Skin and eye protection are required due generation of high pressure and steam.

2. **T or F** Most plastic materials can be safely autoclaved.

3. **T or F** Glass with liquids should be tightly capped for sterilization.

4. **T or F** It is important to quickly remove liquids once the autoclave is opened

5. **T or F** When sterilizing red bag waste is best to place the bag directly on the rack to assure sterilization

6. **T or F** Waste bags should be loosely closed especially if the waste are mostly dry goods

7. T or F Liquid cycles use slow exhaust cycles to slowly release pressure to keep liquids from boiling out

8. **T or F** Heat gloves always protect your hands even when wet

9. **T or F** You should keep your face away and behind the door when you open the door

10. **T or F** All materials will be sterile after a 15 minute cycle at 121 degrees C

Please keep a copy of the quiz in the laboratory biosafety manual for a staff using the autoclaves. The Principal investigator or Biosafety Officer should sign the form.

Signed_____ Date_____

PI or BSO_____

Appendix B- Biosafety Training

Biological Safety Cabinet (BSC) Checklist/Training Quiz

General information

- BSC used for bacteria, viruses, or potentially infectious substances
- Primary barrier especially to reduce exposure to infectious aerosols and respiratory transmission of infectious agents
- Required for BSL2 work/aerosol generating activities of RG2 agents or higher
- BSC certified annually, when moved, or malfunction/repair occurs, ANSI/NSF STD. 49 or manufacturers specifications.
- BSC should not be placed near doors fume hoods, windows, ductwork. etc.
- Only one person should use the BSC at any given time
- Avoid rapid movements in and out of BSC

Types of BSCs and Usage

- Class II A2 (Class II Type A/B3) air in from sash, HEPA, exhaust into room, limit chemicals test tube quantities
- Class II B1 air in from sash, HEPA, 30% recirculated, 70% ducted, small volumes of chemicals
- Class II B2 air from above unit/outside fully ducted, but **not** a chemical hood
- UV light use requires eye/skin protection and a closed sash.
- Do **not** use open flames in BSC

Operation of BSC

1. Turn blower on unit and run 5-10 minutes prior to use to stabilize and purge
2. Assure sash is in the proper position (check with alarm)
3. Be sure certification is current
4. Check magnehelic meter with current certification + or – 10%
5. Purge for 2 minutes after use.
6. Never use if in alarm mode

Procedures

1. Proper PPE with gloves, lab coat, eye protection
2. Disinfect inside of hood with adequate contact time for agent being used
3. Rinse with sterile water or 70% ethanol if bleach disinfectant is used
4. Use good aseptic technique/avoid generation of aerosols
5. Plan your work, disinfect materials before placing in BSC
6. Avoid tall and bulky items, minimal amounts of materials in BSC
7. Designate a clean area, work area, and contaminated area and work clean to dirty.
8. Slow and deliberate movements. Move arms straight in and out
9. Do not block grates, work 4-6” back from grate in center of surface
10. Bag and secure waste inside BSC before disposal outside of BSC
11. Leave BSC blower on if a spill occurs, cover with absorbent, add disinfectant, 15-30 minute contact, wipe area, discard outside gloves
12. Disinfect items as removed
13. Disinfect the cabinet, discard PPE
14. Wash hands and forearms with antibacterial soap

Training Exam- Biological Safety Cabinet (BSC) True or False

1. Use of pathogens in the BSC can begin as soon as the blower is turned on. T or F

2. You should move slowly and deliberately while working in the BSC. T or F

3. Aseptic technique is not needed in the BSC. T or F

4. The interior of the BSC should be disinfected before and after use. T or F

5. The operation of the BSC is improved if placed near a doorway. T or F

6. The BSC is a primary barrier for aerosolized potentially infectious materials. T or F

7. It is best to place commonly used supplies on the grate for easy access. T or F

8. Using large volumes of flammables is okay in a Class II B2 BSC T or F

9. If you spill a pathogen in a BSC, immediately shut off the blower. T or F

10. The BSC requires certification annually. T or F

Sign_____ Print_____ Date_____

Appendix B- Biosafety Training

Laboratory Specific Personnel Training Form

Name of Laboratory Personnel_____

Laboratory Location: Building_____ Room # _____

Principal Investigator _____

Biohazardous Agent(s) or Other Potentially Infectious Material (OPIM)_____

Do you know the location of the Emergency Information/Equipment listed below?

Emergency Contact Numbers	Yes	No
Nearest Telephone	Yes	No
Fire Extinguisher	Yes	No
Eyewash Station/Shower	Yes	No
Disinfectant/Spill Kit/Dust pan for broken glass	Yes	No
Applicable Safety Data Sheets (SDS)	Yes	No

Have you completed lab specific safety training?
Yes No

Have you been trained in control of exposure to blood borne pathogens?
Yes No

Have you read the Standard Operating Procedures (SOP) for the hazardous materials?
Yes No

Have instructions been given on what to do in case of a spill or emergency?
Yes No

Are working alone policies in place for your lab?
Yes No

Do you have experience with aseptic technique and universal precautions?
Yes No

Do you know how to properly segregate the biohazardous & other types of lab waste?
Yes No

Are there sharps protocols in place?
Yes No

Is Personal Protective Equipment (PPE) required and available?
Yes No

Do you know the procedures to minimize the generation of aerosols?
Yes No

Does the work require use of a Biological Safety Cabinet (BSC)?
Yes No

Have you been trained on the safe use the BSC and other specialized equipment?
Yes No

Does the lab generate waste requiring autoclaving?
Yes No

Have you been trained on how to autoclave/disinfect waste materials for disposal?
Yes No

Please sign and date this sheet and keep in a folder in your laboratory.

Employee Signature _____Date of Training _____

PI or BSO Signature_____ Date_____

Appendix C-
Laboratory Biosafety Manual

This document along with other applicable information can serve as a biological safety manual which is required by the Centers for Disease Control (CDC) for work with biohazardous materials.

Include as appropriate:

- This CMU BSL-2 manual
- Biosafety Training Forms
- BSC Training Forms
- Autoclave Training Forms
- CITI Training Completion Documents
- BBP Completion Documents
- Autoclave Training Documents
- Committee approvals (IBC, IRB, IACUC)
- Safety Data Sheets
- BSC Certification Documents
- Standard Operating Procedures
- National Institute of Health Biosafety Guidelines
- Biosafety in Microbiological and Biomedical Laboratories (5th edition)
- ASM Guidelines for Biosafety in Teaching Laboratories
- OSHA Blood Borne Pathogen Standard
- Pathogen Safety Data Sheet (see link below)

Pathogen Safety Data Sheet

(add the sheet from this site https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment.html that covers the microorganisms you are working with in this lab)

Appendix D- Injuries

On-the-job injuries of Central Michigan University Employees/Student employees, based on severity of the injury, are either immediate attention emergencies or non-emergencies. **Call 911 and seek medical attention immediately in the event of an emergency.**

All injuries that occur at work should be reported as soon as possible (preferably within 24 hours) to the Workers' Compensation office at 774-7177. Faculty, staff and student employees requiring medical treatment for work-related injuries/illnesses should seek treatment at one of the following CMU designated medical providers:

COMP - Occupational Medicine

1523 S. Mission (next to Rally's)

773-2339

Monday - Friday, 8am - 4pm

Closed Saturday and Sunday

Ready Care - Use this facility when COMP is closed (*except for bloodborne pathogen exposures and emergencies*).

1523 S. Mission (next to Rally's)

773-1166

Monday - Friday, 4-7 p.m.

Saturday & Sunday, 8 am- 7pm

Emergency Facility - Use this facility for critical emergencies or when Ready Care is closed.

McLaren - Central Michigan Fast Track or Emergency Department

1221 South Drive

Follow-up visits must be scheduled at COMP.

Note: If an injured employee/student employee chooses to see his/her own medical provider or seek treatment at facilities other than those listed above, the employee may be responsible for any incurred expense.

Appendix E-Biohazard Incident Report Form

BIOHAZARD INCIDENT REPORT FORM

Instructions: This form should be completed by lab supervisors, principal investigators (PIs), lab instructors, or the person involved in the incident. Complete the appropriate information below and provide the Biosafety Officer at schul1te@cmich.edu. Please forward this information as soon as possible and preferably within 24 hours of the incident.

General Information

Your Name:

Email:
Phone number:

Report Date:

Incident Information

Name of person in incident:

Role: (employee, student, visitor, etc.)

Lab Location: (building and room)

Witness Names_____

_____

Lab Information: (check all that apply)

☐BSL1 ☐Research Lab ☐Controlled access

☐BSL2 ☐Academic lab ☐Hand washing sink

☐BSL3 ☐ Insectary ☐Biosafety cabinet in use

☐Eyewash ☐Animal room ☐Safety shower

☐SOPs ☐Training Documents ☐Sharps protocols

☐Signage ☐Emergency contact info. ☐Lab Manual

☐Other_______(specify)

Nature of Incident (check all that apply)

☐Needle stick ☐Puncture wound ☐Laceration

☐Aerosol exposure ☐Animal bite ☐Animal scratch

☐Spill ☐Environmental release outside of lab

☐Splash to: eyes nose mouth (circle)

☒Unknown exposure_____(specify)

Agents Involved (check all that apply)

☐Human Derived Materials

☐Bloodborne pathogens

☐Recombinant DNA

☐Viral Vectors

☐Biological toxin

☐Infectious or Pathogenic Agent

Other_____(specify)

Personal Protective Equipment Used

☐Nitrile Gloves ☐Lab coat ☐Shoe/Head covers

☐Safety Glasses ☐Safety Goggles ☐Face shield

☐Respiratory Protection_____(specify)

☐Other_____ (specify)

Description of Incident: (Use separate page if needed)

(What happened, immediate response/first aid measures taken, medical treatment provided, cause of incident if known, etc. (include dates and times if possible)

Signature Date

Biosafety Program Use Only:

Date Received_____

Reviewed by_____

Follow-up:_____

Reported to:__

Attached Documents: