

POSTERS WANTED!

BE Undergraduate Research Symposium

Present your undergraduate research to **faculty, research scientists, and peers** at a *lively poster session* with **FREE FOOD**. Posters on **group/ class/ extracurricular projects** are welcome!

Friday, April 19th
1-4pm
Koch Lobby
(bldg 76)

Win prizes!
Learn more!

NEXT STEPS?

1. Talk to your research advisor
2. Sign up here



MIT BE
BIOLOGICAL ENGINEERING

MIT Massachusetts
Institute of
Technology

printed for **FREE!**

Lab-Specific Biosafety Training for 20.109

Why do we start with **safety**?

- This lab space contains a number of chemical and biological **hazards**
- Risk of **injury** and infection for anyone work in or visiting the lab space
- Risk of producing and releasing **environmentally dangerous** material
- Improper use and containment of hazards can also **contaminate** lab stock material and ongoing experiments

Hazards are categorized by biosafety level



- Biosafety level always posted at the door of the lab
- A combination of:
 - lab practice / technique
 - safety equipment
 - facility design
- Based on concept of “containment”
- For protection of:
 - personnel
 - lab
 - environment

B L 2

What does BL2 mean?

- Suitable for work involving agents that pose **moderate hazards** to personnel and the environment.
- Organisms associated with disease that is rarely serious and often **treatable**

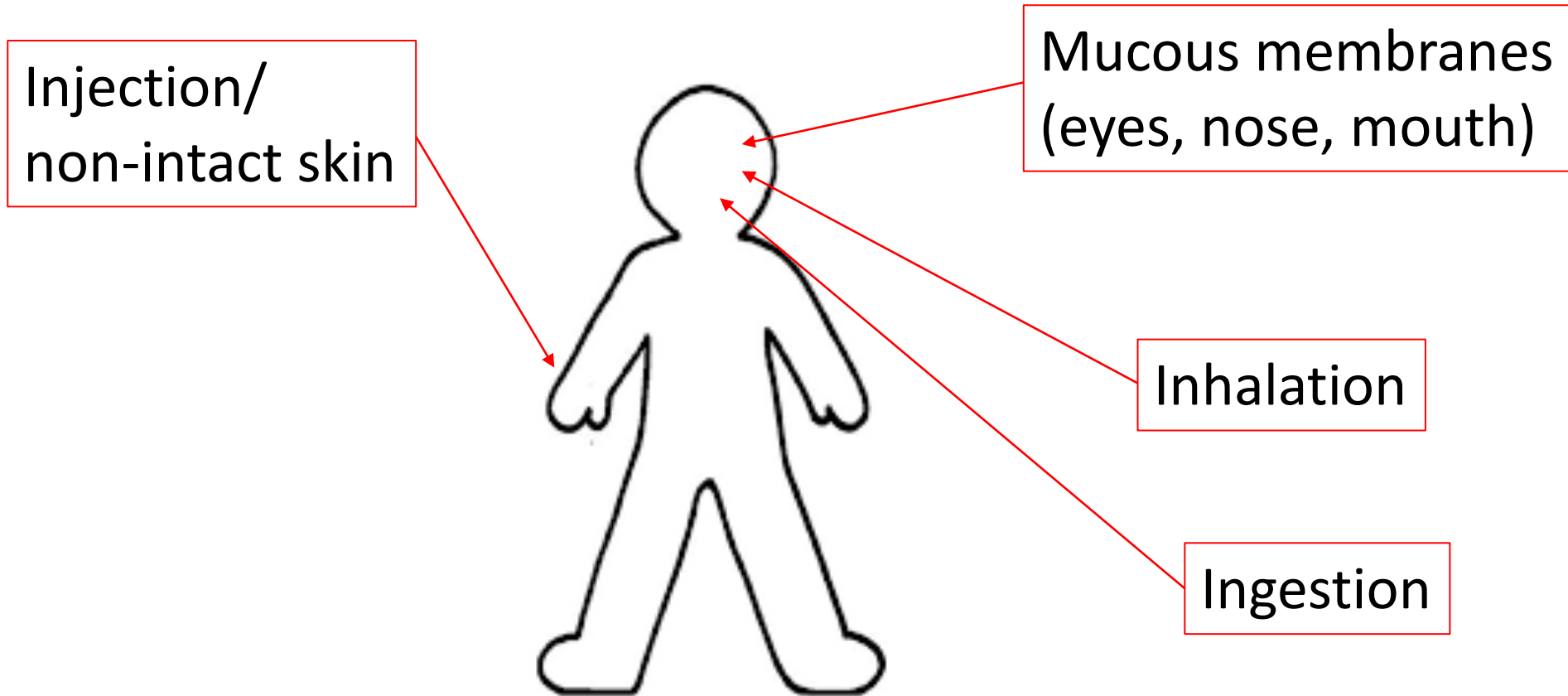
Why are we BL2?

- Work with **human derived material** including established and primary human cell lines/culture.
- **Viral Vectors**: lentiviral vector, Adenoviral vector

What factors determine your risk when working in a BL2 space?

- **Infectivity**
- **Pathogenicity**
- Availability of **prophylaxis**
 - Before exposure (e.g. vaccination)
 - After exposure but before infection (e.g. antibiotics, antivirals)
- Your **health status**
 - Consult with MIT Occupational Health or your personal physician about your research activities

Routes of exposure and transmissibility



Minimizing exposure when working with BL2 materials

Standard Microbiological Procedures

- Restrict or limit access to space
- Wear PPE
- Wash your hands!
- Disinfect containers and surfaces



Prohibited activities

- Eating (chewing gum)
- Drinking
- Smoking / vaping
- Applying cosmetics, i.e. lip balm
- Handling contact lenses
- Avoid touching face or biting your nails



No food or drink can be stored in the lab

- In bag in cubby is fine
- Not at bench
- Must eat and drink outside the lab door



Personal Protective Equipment (PPE)

DO wear:

- Lab coat
- Gloves



DO NOT wear:

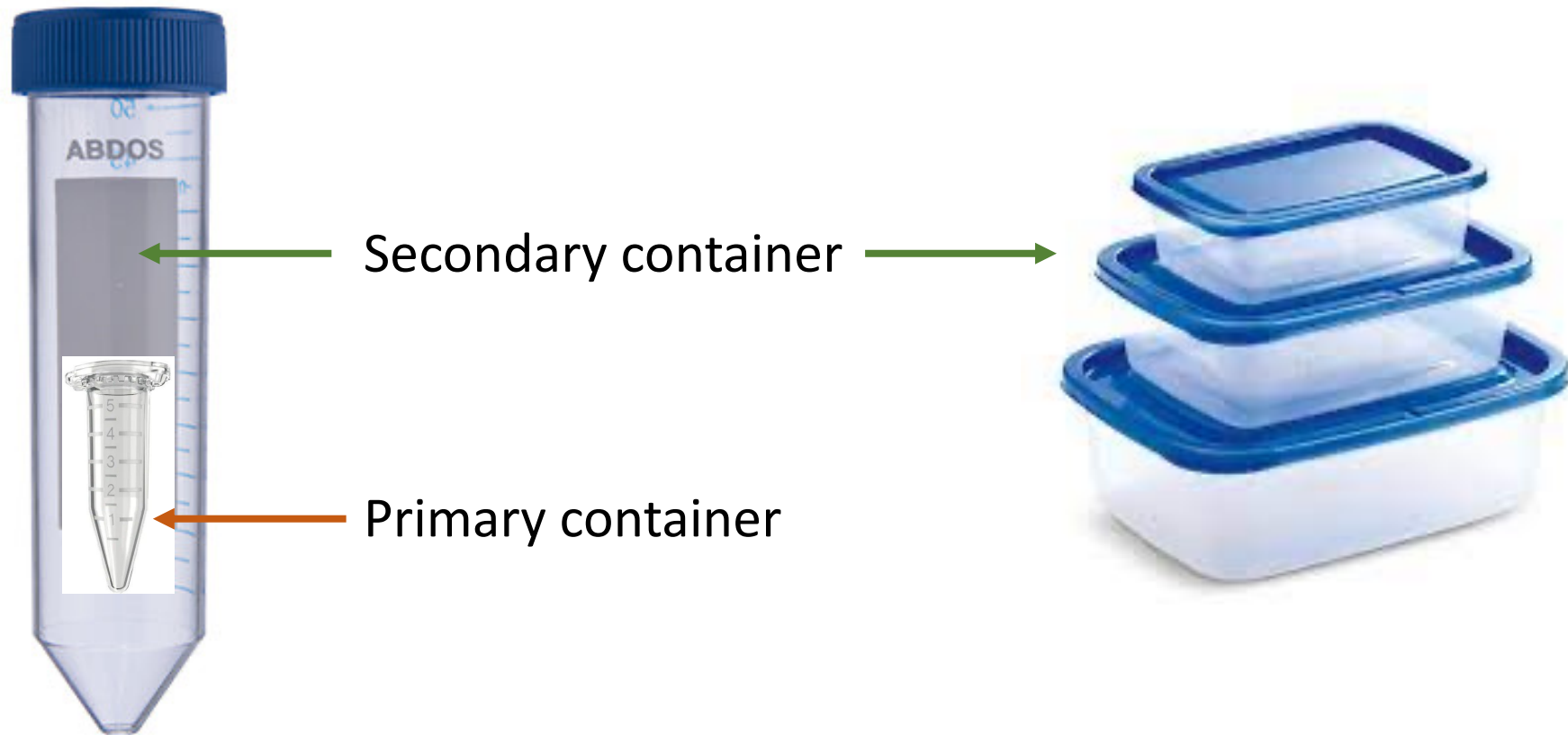
- Skirts/shorts without additional leg coverings
- Open-toed shoes



PPE should remain in the research area

- **Lab coats** should be left in the lab when leaving the room
 - To an auxiliary space to use equipment
 - To go to the TC room
- **Gloves** should not be worn when touching:
 - Phones
 - Door handles
 - Elevator buttons
- Use the “One glove rule” when carrying samples outside the lab

Carry samples in a secondary container



Safe disposal of hazardous materials in the lab

Disposing of biohazardous waste

- Researcher has responsibility for management of research material from “cradle to grave”

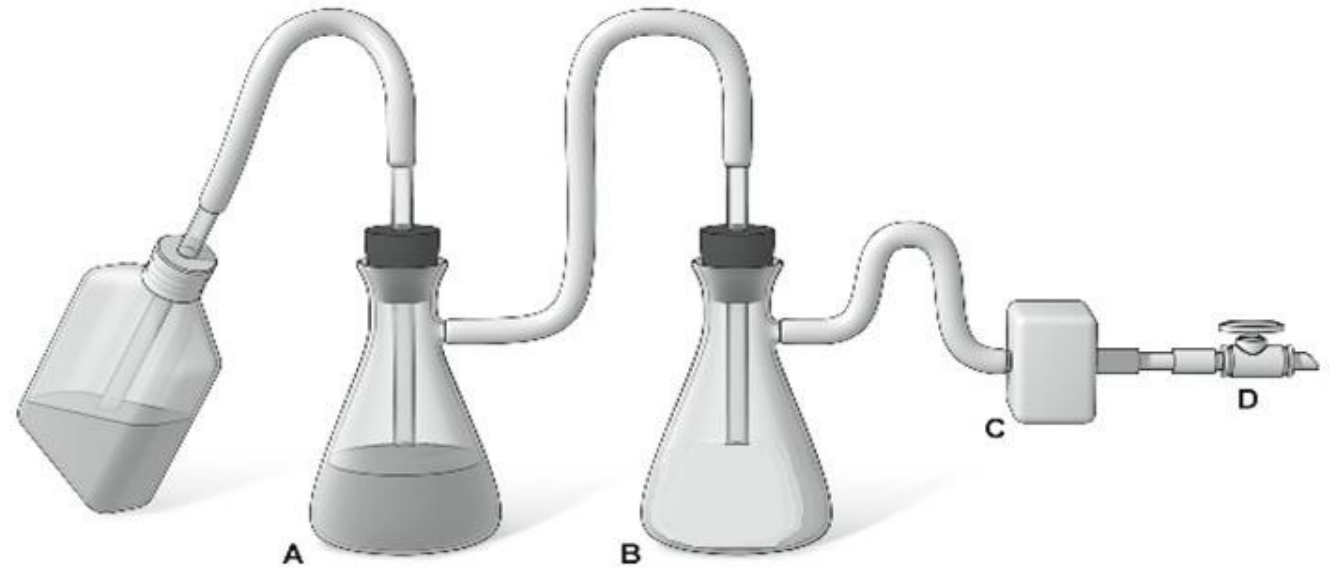
- Types of biological waste:

- Liquids
- Solids
- Sharps



Liquid biological waste collection

- Liquid biological waste (cell media) can be aspirated into a collection flask using a vacuum pump
- These are for biological waste only
- Chemical waste is collected in jugs and disposed of separately



A = primary collection flask with disinfectant
B = overflow flask with disinfectant
C = hydrophobic or HEPA filter
D = to vacuum pump

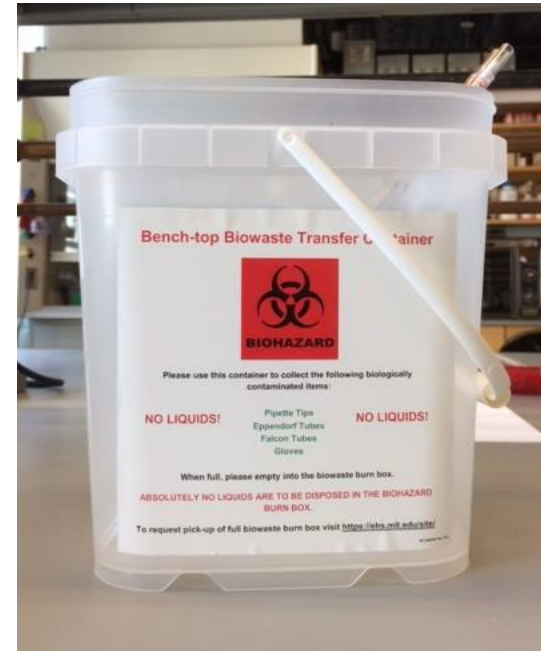
Neutralizing liquid biological waste

- Instructors perform this task– notify us if the waste level is high
- Use chemical disinfectant
 - Clorox bleach (1:10 final volume)
 - Let sit for at least twenty minutes
 - Pour down the drain and flush with water
- Because aspirator waste is mixed with a **reactive chemical** and **disposed down the drain**, it is important not to mix in chemical waste

Solid biohazard waste

- Solid biohazard waste should be collected at the bench in biowaste transfer containers
- This includes:
 - Tubes (conical and microcentrifuge)
 - Serological pipets
 - Pipet tips
 - ALL GLOVES
- At the end of lab, transfer the contents of the transfer container to the burn box at the front of the room

Biowaste Transfer Container

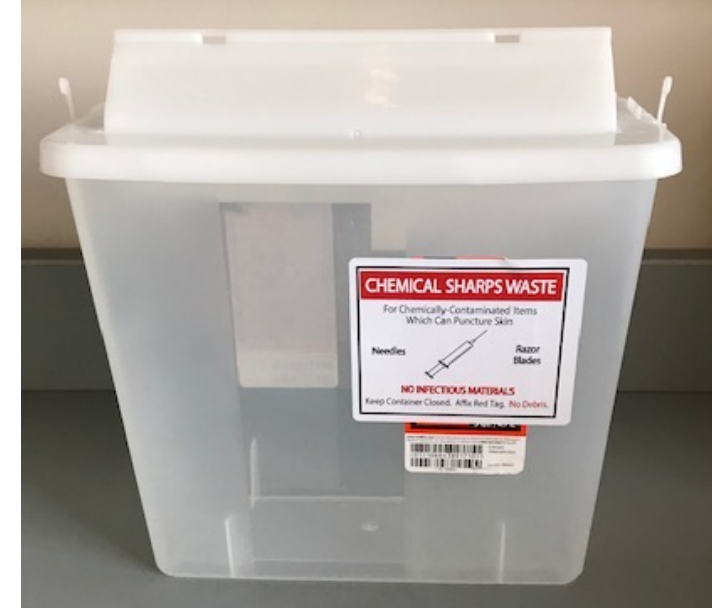


“Burn Box”



Sharps disposal

- Anything that can puncture or cut the skin
 - Pasteur pipettes
 - Glass vials, slides
 - Glass culture tubes
- Dispose of **biological sharps** in red sharps bins at bench or in hood
- Dispose of **chemical sharps** in clear sharps bins (provided when needed)
- Notify instructors when bins are full



What if something goes wrong?

What if you are exposed to a biological hazard?

- If direct contact to your face or skin or if stuck by a needle or sharp
 - Immediately, wash the area with soap and water for 10-15 minutes
 - If it's in your eyes, nose or mouth, flush with water for 15 minutes
 - Tell the Instructors or TA immediately
- Go to the Medical Department (E23)
- Instructor must submit an incident report



Cleaning up biohazardous spills



- Alert instructors, put on appropriate PPE, gather spill kit and appropriate equipment
 - **Remove** any broken glass or sharps
 - **Cover** the spill with paper towels
 - **Disinfect** the spill: Saturate paper towels with disinfectant, let sit for 20 minutes
 - **Clean** up the spill and dispose of spill materials in bio box
 - **Repeat** steps 2-5 as needed

Emergencies

- MIT Alert
<http://emergency.mit.edu/mitalert/>
- **617-253-1212** (fire/ injury/ police 24/7)
- Dial **100** from lab phone
- Use emergency response guide posted in the lab

MIT Massachusetts Institute of Technology **Emergency Response Guide**

EMERGENCY NUMBERS

Fire/Medical/Police call MIT Police **100 or 617-253-1212**
Facilities Operations Emergency Service Request **FIXIT 617-253-4948**
EHS After Hrs Emergency **617-253-4948** 8-5 Business Hrs **617-452-3477**

STAY CALM AND FOLLOW INSTRUCTIONS

FIRE Immediate Action <ul style="list-style-type: none">PULL FIRE ALARMAlert OthersEvacuateCall MIT Police from a safe location. Additional Information <ul style="list-style-type: none">Do NOT use elevators.Close Doors as you leave.Feel Doors with the back of your hand. Do NOT open doors that hot. <p>Wait for Emergency Personnel at the Department's (Emergency Preparedness Plan) designated Waiting and Meeting Area to provide any useful information.</p> <ul style="list-style-type: none">Fire Location,What happened,If there are injuries, andYour name, location, and telephone number.	Medical Emergency FOR LIFE THREATENING SITUATIONS OR MENTAL HEALTH EMERGENCIES Call MIT Police Examples of life threatening emergencies: <ul style="list-style-type: none">Serious injuries or burnsPoisoningUnconsciousnessShock <ul style="list-style-type: none">For non-life threatening situations dial MIT Urgent Care: 617-253-4481 - 24 hours/dayUrgent care walk in service 7a.m. – 11 p.m. E23 HAZMAT Spill MAJOR SPILL - Major hazardous material and waste spills CALL Police(100 or 617-253-1212) and also report incident to your supervisor. MINOR SPILL - Minor hazardous materials or waste spills that present no immediate threat to personal safety, health, or the environment. Call EHS (617-252-3477)	Active Shooter Silence Cell Phone RUN (Pursue the area if safe to do so) if the sound of gun shots are far away and you can safely access an exit <ul style="list-style-type: none">GET OUT! Leave immediately and get away from the MIT CampusNotify MIT PoliceGet updates from www.emergency.mit.edu HIDE (Take immediate refuge) if you feel the shooter is close to you and you cannot safely exit the building <ul style="list-style-type: none">Look down, use door stops, bar door with desks, turn off lights.Search for objects that can be used as weaponsCall Police via land lineMIT Police can trace where you are. FIGHT (Attack the shooter) if the shooter has entered the room you are in <ul style="list-style-type: none">Obtain improvised weapons (axis/axe, letter opener, fire extinguisher)Immediately attack shooter, direct your attack at his/her head/faceDo not attempt to plead or bargain with the shooter
Facilities Operations Emergency EMERGENCY SERVICE REQUESTS DIAL FIXIT (3-4948) from any campus telephones. Press "1" to speak with someone immediately. <ul style="list-style-type: none">After Hours HAZMAT incidentsGas or Burning OdorSuspect PipeElevator EntrapmentLoss of utilities, such as:<ul style="list-style-type: none">ElectricalChilled waterAny situation that may pose an immediate threat of serious injury to personnel or damage to property.	Do You Know <ul style="list-style-type: none">emergency exit locations?fire alarm locations?blue light phone locations?assembly area locations?emergency and safety shower locations?Your DLC's Emergency Preparedness Plan?  <p>SCAN</p> <p>OG pure</p>	Threats The person who receives the call/package/threat should remain in the area to talk to the MIT Police officers when they arrive. SUSPICIOUS PACKAGES <ul style="list-style-type: none">Do not touch or disturb objectMove to a safe location and contact MIT PoliceUse a landline / NO CELL PHONE USE.Tell MIT Police what makes it suspicious to you.If told to evacuate, look around for anything else suspicious and report. PHONE THREATS <ul style="list-style-type: none">Remain calm and try to obtain as much information as possible from callerObtain an accurate description of what the caller said and try to obtain as much information as possible. (Where, When, What, Who, distinctive speech, accent, sex, background noise)Record the number indicated in caller IDContact MIT Police

See Something - Say Something

Revision 1, Date: 5/19/2013