About this program. . .

- This training program was prepared by Brandy Nelson, Sr. Biological Safety Specialist and Marcia Finucane, M.S., Biological Safety Officer, University of Kentucky
- Rush University Medical Center is using these materials by permission of Ms. Finucane.
- Questions? Contact Ed R. Blazek, Ph.D., Biological Safety Officer (312-942-5222; Ed_R_Blazek@rush.edu).





Biological Safety Training



- Module 1: Basics of Biosafety
- Module 2: Risk Assessment
- Module 3: Working with Infectious Agents
- Module 4: The Biosafety Levels
- Module 5: The Biosafety Audit



Biosafety Training

- Basics of Biosafety at UK
 - -Gaining Project Approval
 - Basic Tools of Biological Safety in the Lab



Red Tape!

All Labs at the University of Kentucky using rDNA, infectious material, or other potential biohazards must contact the Department of Biological Safety before beginning work







Approval Process for Beginning a Research Project at the University of Kentucky

What approval do I need for my project?

Working with Radioactive Materials?

Approval needed from Radiation Safety.

Working with Human Subjects or Specimens?

Approval needed from Institutional Review Board (IRB)

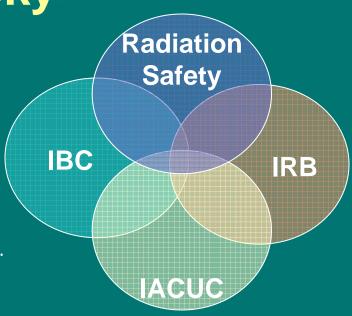
Working with Infectious Agents, Recombinant DNA, Potential Biohazards?

Approval needed from Institutional Biosafety Committee (IBC)

Working with Research Animals?

Approval needed from Institutional Animal Care and Use Committee (IACUC)





How to Gain Approval for Your Project

- Registration Form
 - Available from Department of Biological Safety or on-line
 - <u>http://ehs.uky.edu/biosafety/forms.html</u>
 - Complete and e-mail back to Department of Biological Safety
 - Send any other hard-copy documents required via campus mail
- Perform biological safety audit with Department of Biological Safety

Basic Tools of Biological Safety

- Biological Safety Cabinet (BSC)
- Personal Protective Equipment (PPE)
 - -Face Shields
 - -Disposable Lab Gowns or Lab Coats
 - -Gloves
 - -Respirators



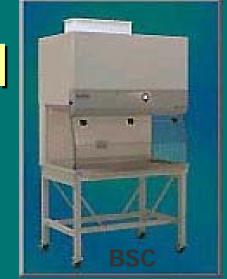


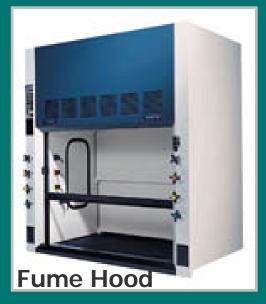
BSC vs Fume Hood

Biological Safety Cabinets (BSC) provide:

Protection for the user and the product

HEPA filtration of air into cabinet and exhaust air





Fume hoods provide:

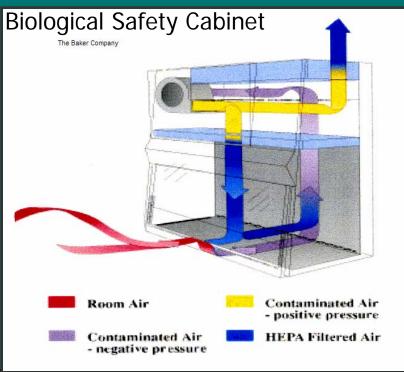
Removal of contaminated air

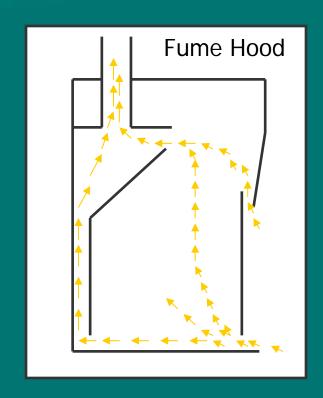
Protection for the user from chemicals



BSC vs Fume Hood

Biological Safety Cabinets provide user and product protection via HEPA filtered air circulation.





Fume Hoods provide user protection via removal of contaminated air to an external exhaust.



Biological Safety Cabinets



- Must be properly maintained and regularly serviced
- Must be certified annually and when new, moved, or repaired
- Must be used in conjunction with good microbiological techniques
- Provide protection for personnel, product, and environment





Biological Safety Cabinets



- Most commonly used primary containment device for microbiological laboratories
- Most common type used in biomedical research on University of Kentucky campus is Class II Type A
- The Department of Biological Safety can assist laboratories with selection of a BSC

Types of Biological Safety Cabinets

Choose the correct Biological Safety Cabinet for your experiments.

Contact the Department of Biological Safety before purchasing a new cabinet or beginning a new project for help in selecting the appropriate cabinet.

Туре	Face Velocity (fpm)	Airflow Pattern	Radionuclides or	Biosafety Levels	Product Protection
			Toxic Chemicals		
		Intake at front of cabinet,			
Class I Open Front	75	Exhaust rear and top	No	2,3	No
		through HEPA filter			
Class II Type A	75	70% recirculated through	No	2,3	Yes
		HEPA, Exhaust through			
		HEPA			
Class II Type B1	100	30% recirculated through	Yes (low levels/volatility)	2,3	Yes
		HEPA, exhaust via			
		HEPA and hard ducted			
Class II Type B2	100	No recirculation, Total	Yes	2,3	Yes
		exhaust via HEPA and			
		hard ducted			
Class II Type B3	100	Same as IIA but plena	Yes	2,3	Yes
		under negative pressure			
		to room and exhaust air			
		is ducted			
Class III (Glovebox)	N/A	Supply air inlets and	Yes	3,4	Yes
		exhaust through dual			
		HEPA filters			
Riosafety in Microbiologics	al and Riomedical Laborato	ries http://www.cdc.gov/od/ohs/bio	sftv/hmhl4/hmhl4toc htm		



Want More Training on BSCs?

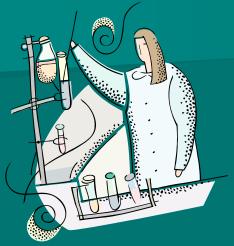


The Department of Biological Safety has an on-line training program for biological safety cabinets.

http://ehs.uky.edu/classes/bsc/welcome.html



Personal Protective Equipment







- Clothing and other work accessories designed to create a barrier against biological hazards
- Often used in combination with BSCs and other containment devices
- Can provide primary barrier if work cannot be accomplished in a BSC

Face Protection From Splashes

Utilize when there is a potential for exposure to splashes of biological material

■ Safety glasses should be used when there

is a risk of impact injury

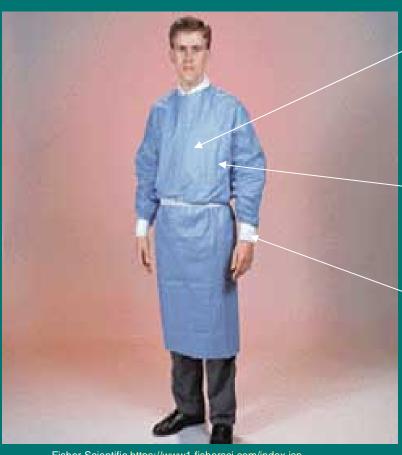






isher Scientific https://www1.fishersci.com/index.isp.

Disposable Lab Gowns



Solid front No Opening Water resistant

Fastens in Back No Snaps in Front

Knit Cuffs Meets requirements for OSHA blood-borne pathogens standard





Types of Gloves



Fisher Scientific https://www1.fishersci.com/index.jsp

Nitrile

- No Allergens
- Different Grades
- Puncture Resistant
- Preferred over latex for durability and lack of allergens
- Some are tested for: chemical resistance viral penetration



Types of Gloves



Fisher Scientific https://www1.fishersci.com/index.jsp

Latex

- Allergens
- Powdered/Powder Free
- Less Expensive
- Some tested for:

 chemical resistance
 viral penetration



Glove Use and Hand Care

- Glove use and handwashing can lead to dry, cracked, chapped hands
- Dry, cracked skin is not a good barrier against infectious agents





Glove Use and Hand Care



- Moisturize hands routinely after washing
 - Use only nonpetroleum based, lab approved moisturizers if you wear latex gloves
 - Common hand lotions will degrade latex



Hand Sanitizers

- Alcohol-based hand sanitizers offer an alternative to handwashing
- Efficacy against common hospital microbes
- Efficacy against other microbes has not been fully tested
- Handwashing is still preferred and should be utilized when there is gross contamination of hands



Respiratory Protection Devices



Utilize respiratory protection when there is a high probability of generating infectious aerosols Respiratory Protection Devices:

N-95 Respirator

PAPR (Powered Air Purifying Respirator)

Must have medical clearance and/or fit-testing to wear

Laboratory must have a respiratory protection program in place to utilize

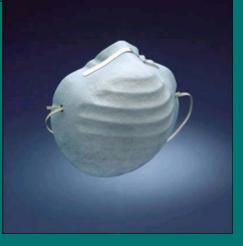
Optional use for any laboratory employee working in an environment that does not require respiratory protection



Surgical Masks



Surgical Masks do not provide respiratory protection to the wearer only splash protection.



Surgical masks protect patients and products from the wearer.

