

Biosafety in Teaching Laboratories

A. Safety standards and guidelines

Hazards Communication Standard: 29 CFR 1910.1200 (83) (1990) Occupational Exposures to Hazardous Chemicals in Laboratories: 29 CFR 1910. 1450
Bloodborne Pathogens Standard: 29 CFR 1900. 1030 (1991)

B. These standards require that employers

(Are we employers? Yes. We employ lab assistants, teaching assistants and student workers.)

1. set up a plan that addresses the standards: " Exposure Control Plan"
2. implement the plan
3. monitor compliance with the plan and standard

C. In detail:

1. set up plan to eliminate or minimize exposure
 - a. assess circumstances and procedures of risk in the laboratory
 - b. identify individuals exposed to risk
 - c. determine the procedures and equipment necessary to eliminate or minimize those risks
2. implement the plan
 - a. devise training program for exposed individuals to aid them as to :
 - 1) identification of exposure incident
 - 2) response to exposure
 - b. written documentation necessary
 - c. work procedure changes
 - c. personal protective equipment (PPE)
 - d. HBV vaccination and follow-up
 - e. appropriate signage in the laboratories- language issues
 - f. housekeeping issues - limited access areas
3. training of individuals (1/year) must include:
 - a. access to copy of regulatory text and explanation of contents
 - b. explanation of exposure contingency plan
 - c. recognition of tasks with risk
 - d. safe work practices
 - e. PPE use and disposal
 - f. emergency procedures
 - g. exposure incident report
 - h. training must include a question and discussion period
 - i. HBV vaccination - mandated for all employees who have occupational exposure to blood
 - j. documentation of training (must be kept 3 years)

D. Interpretation of the Standards Relative to Students

1. Risk assessment with culture selection -BSL 1 and BSL 2
 - a. interpretation of the standards
 - b. institutional and departmental policy formation
2. Personal protection equipment
 - a. lab coats
 - b. eyewear
 - c. gloves
3. Limited or restricted access to laboratories

D. Good Teaching Practices - the emphasis on biosafety

- 1.Documentation
- 2.Procedures of special note.

E. Things to think about

- Using appropriate precautions for the BSL level organisms you are using
- Making sure students and TAs wear appropriate protective gear
- Making sure students and TAs use and dispose of protective gear correctly
- Lab coats in back packs going home every day
- How to properly take off gloves
- Wearing goggles when aerosols are possible
- Properly disposing of infectious waste
- Making sure students and TAs follow guidelines for proper disposal of infectious wastes
- Properly disposing of stains, and fixatives
- Working with environmental isolates

F. References

1. Safety Standards:

OSHA Regulations (Standards-29CFR) Hazard Communication.1910.1200
<www.osha.gov/od/ohs/manual/chemical/chmsaf2.htm>

OSHA Regulations (Standards-29-CRF) Bloodborne Pathogens. 1910.1030.
www.ohha.gov/od/ohs/biosafety/bmb1

CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition

<http://www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm>

CDC/NIH: Biosafety in Microbiology and Biomedical Laboratories

<http://www.cdc.gov/od/ohn/biosfty/bmb14/bmb14toc.htm>

Fleming,D.O. and D.L. Hunt(ed). 2000. Biological Safety, Principles and Practice .3rd ed. ASM Press, Washington, D.C.

The environmental protection agency's Microbiology resources
<http://www.epa.gov/nerlcwww/>

Association for Biological Safety
<http://www.absa.org/>

World Health Org
http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Recombinant DNA
<http://www.absa.org/tt/GuidetoGuidelinesPIResponsibilities.doc>

USEPA Manual of Methods Manual of Methods for Virology: Chapter 2 – Cleansing Laboratory Ware and Equipment⁰⁴⁻⁰⁷⁻²⁰¹⁰

"This is the electronic text form of Chapter 2 from the USEPA Manual of Methods for Virology."
<http://www.epa.gov/nerlcwww/chap2.pdf> (PDF)

2. Appropriate Culture Selection:

www.atcc.org

www.cdc.gov/od/ohs

www.dsmz.de/strains/teaching.htm

The CDC's BSL-1 and BSL-2 2003 recommendations are included below, and more information can be obtained at:

www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm

<http://www.cdc.gov/OD/OHS/biosfty/biosfty.htm>