



Lab Notes

January 2003

IUPUI ENVIRONMENTAL HEALTH AND SAFETY

UV Hazard – Is Blue Light Dangerous?

A first-semester freshman gained a part-time job working in a department with research laboratories. The 18-year old student's work did not involve working in the laboratory, but when a project came up that required a "clean" environment, a suggestion was made to use a biosafety cabinet. Biosafety cabinets have very clean air relative to airborne particles. The person in charge of a research lab containing a biosafety cabinet allowed use of the cabinet for the proposed project.



When the student was ready to begin the project, there was no one in the lab so she began her work in the designated biosafety cabinet. She wondered why there was blue light present in the cabinet but was not concerned by it. There are many things in a research lab that may seem strange to a first year undergraduate student, but they are sometimes reluctant to ask questions for fear of appearing ignorant.

After a while, she noticed that her eyes began burning and was unsure why this was happening. She left the area and reported the problem to her supervisor. After the exposure and subsequent trip to Employee Occupational Health Services, it was determined that she had relatively minor corneal burns. Pain in the eyes was present for several days but she recovered fully.

The biosafety cabinet had a light switch that indicated 'germicidal', but the student did not associate this with ultraviolet light. Since no training had been given concerning the use or operation of the biosafety cabinet, lights and light switches were unknown to the student. No personal protective equipment (safety glasses) was supplied to the student to protect her from 'unknown' hazards in the lab.

Lessons learned from this incident:

- ◆ Blue light can be dangerous!
- ◆ Biosafety cabinets should not be used with the UV light illuminated.
- ◆ Germicidal is another word for UV light in biosafety cabinets.
- ◆ Training must be provided on all lab equipment before it can be safely used.
- ◆ Safety glasses with polycarbonate lenses typically absorb over 99% of UV light and protect the eyes from injury.
- ◆ There are better ways to disinfect a biosafety cabinet other than UV light, such as liquid disinfectants. If the strength of disinfecting power of a UV lamp is not checked routinely, a false sense of security may be gained by it. Some UV lamps lose their illumination power rapidly.
- ◆ Notification of the use of UV light and the potential exposure issues that could result should be posted on or by the device.

Ethidium Bromide Waste Disposal

By Steve Bozinovski

IUPUI is committed to the ideals of best lab practices, prompting pollution prevention, and reducing risk to the environment. With those ideals in mind, the Department of Environmental Health and Safety (EHS) has developed a procedure for the disposal of ethidium bromide (EtBr) on campus. All unwanted EtBr gels and contaminated debris will be collected and disposed of through EHS. EtBr mixed with human materials (blood, serum, etc.) should be segregated from other biohazardous waste, placed in an appropriate biowaste container and disposed through EHS.

Ethidium bromide is a potent mutagen. EtBr gels have routinely been found to have a high concentration of EtBr. Refer EtBr-containing gels to EHS for collection and disposal through our hazardous waste program. EtBr buffer solutions used for 40 to 60 minutes in electrophoresis procedures have been found to have very low concentrations of EtBr, and can be discarded down a sink drain with copious amounts of water. EtBr solutions used for a longer period of time or other applications should be referred to and evaluated by EHS for disposal. Any debris such as paper towels, gloves, test tubes, etc., should be evaluated by the researcher. If you feel that they are heavily contaminated, include them with your EtBr gels. Any sharps, for instance pipette tips, contaminated by EtBr should be kept in a separate sharps container and disposed through EHS.

The Environmental Health and Safety department at IUPUI asks that researchers use leak proof containers to handle the EtBr gels. Ziploc makes an inexpensive and leak proof container (Figure 1) acceptable for storage and transportation of EtBr. It comes in a rectangular 9 1/2 cup container size shown in Figure 2. Any containers along these lines will be acceptable. Heavy gauge bags will not be accepted because they do not have an air tight seal and have a significant potential for leaking.



Figure 1



Large Rectangle
9 1/2 CUPS

Figure 2

There is an expressed concern for contamination of EtBr in lab work space. The method recommended by EHS for decontamination is as follows. Wash the equipment once with a paper towel soaked in a decontamination solution consisting of 4.2 g of sodium nitrite and 20 ml of hypophosphorus acid (50%) in 300 ml of water. This solution has a pH

of 1.8 and may be corrosive to some surfaces. Make up the decontamination solution just prior to use. Then wash five times with water-soaked paper towels, using a fresh towel each time. Soak all of the towels in decontamination solution for 1 hour. Check for completeness of surface decontamination by passing a UV light over the contaminated area while checking for illumination of EtBr. Glass, stainless steel, Formica, floor tile, and the filters of transilluminators have been successfully decontaminated using this technique. For information on recommended methods of EtBr disposal, contact IUPUI Environmental Health & Safety Department at 278-3328.

NEW EMPLOYEE TRAINING SCHEDULE	
Union Building Roof Lounge - 6th Floor	
General Safety -For all new employees. 10:00- 12:00 Noon	January 7, 14, 21, 28, 2003 February 4, 11, 18, 25, 2003 March 4, 11, 18, 25, 2003 April 1, 8, 15, 22, 29, 2003
Union Building (North) - Room 542	
Bloodborne Pathogens -For all employees who may be exposed to human blood, body fluids or tissue. Session held the 2nd & 4th Monday of every month from 8:30 - 9:30 A.M.	January 13 & 27, 2003 February 10 & 24, 2003 March 10 & 24, 2003 April 14 & 28, 2003
Biosafety Training -All employees who work with biohazardous materials are encouraged to attend. Session held the 4th Monday of every month from 9:30 - 10:30 A.M.	January 27, 2003 February 24, 2003 March 24, 2003 April 28, 2003
Chemical Lab Safety -For all employees who work with chemicals in laboratories. Sessions held the 2nd Monday of every month from 9:30 - 11:30 A.M.	January 13, 2003 February 10, 2003 March 10, 2003 April 14, 2003

Grant Proposal Safety Compliance Agreements

Recently, the Department of Environmental Health and Safety (EHS) has received more requests to "sign off" on proposals that state research investigators are following all governmental regulations and institutional policies regarding safety. During the past year, IUPUI/IUMC investigators submitted many grant applications to the U.S. Army which asked specific questions about compliance with OSHA regulations and required assurance of compliance by the University Health and Safety Officer. Needless to say, all investigators submitting proposals did not meet all regulatory requirements.

At this time, IUPUI does not require a statement of health and safety regulatory compliance for all research grants submitted. This is a requirement by certain granting agencies. There are other universities, however, that have tied the grant application process to safety performance.

In the past, EHS has signed safety compliance agreements with the promise from investigators to rectify their deficiencies. Since information on these requirements has not always been provided to lab personnel in a timely manner in the past, a review of regulations and policies is provided to insure that everyone is aware of them. With information from the Laboratory Safety Coordinator network and the *Lab Notes* newsletter, current safety requirements should be known to all investigators. EHS will not sign off on compliance requests in the future unless the lab facility and staff members are in current compliance. Keep in mind that these regulations and policies apply to all laboratories, not just those applying for research grants.

OSHA Laboratory Standard (as implemented at IUPUI)

- For all users of chemicals in labs
- Requires initial training session (updates recommended)
- Requires standard operating procedures for hazardous materials, equipment, and operations
- Requires an inventory of hazardous materials
- Requires correction of deficiencies listed as "required" during the annual Laboratory Safety Survey

OSHA Bloodborne Pathogens Standard (as implemented at IUPUI)

- For those exposed to human blood and body fluids or HIV/HBV infected media
- Requires initial and annual training sessions
- Requires customizing of the generic Exposure Control Plan
- Requires personal protective equipment use
- Requires proper disposal of biohazardous waste

State and Federal Hazardous Waste Regulations

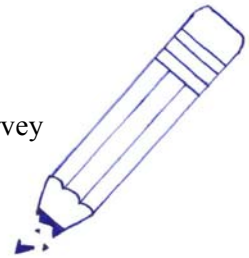
- For all producers of chemical waste
- Maintain in closed and labeled containers
- Requires that chemical wastes are handled according to EHS "Waste Disposal Guidelines"

IUPUI Policies for Laboratory Use

- Eye/Face Protection Policy
- Eating and Drinking Policy

Other Considerations

- For research involving recombinant DNA, proposal approval from the Institutional Biosafety Committee.
- For research involving experimental animal use, proposal approval by the appropriate Animal Care and Use Committee
- For use of radioisotopes, proposal approval from the Radionuclide Radiation Safety Committee



Some Half-Truths in Safety

Many issues involving lab safety are not as clear cut as we would all like to believe. Everyone involved in lab safety, the bench scientist, manager or safety officer has his own understanding about the roll he plays in providing a safe environment. Unfortunately, this understanding is not uniform, but varies by department and people within each department. As we examine some safety half-truths and realities, see if your beliefs have been rooted in reality.

Half-Truth: Environmental Health and Safety (EHS) is responsible for enforcing safety policies and regulations.

Reality: Department management is responsible for enforcement.

Those people who plan, lead, and control university teaching, research, and other services are also the same people who plan, lead, and control the safety function of the organization.

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Some Have-Truths in Safety

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EHS is the in-house advisor, facilitator, and consultant to departmental management who must make safety happen.

Half-Truth: Management commitment is the key to a good safety program.

Reality: Management action is the key to a good safety program.

Management can speak eloquently on safety but if they don't "walk-the-talk," the employees aren't likely to either. Real management commitment is action-planning, organizing, leading, and controlling health and safety.

Half-Truth: Complying with OSHA regulations assures a good safety program.

Reality: OSHA regulations are only part of a good safety program.

The OSHA standards are recognized as minimal requirements and often don't specifically cover issues where lab accidents occur. The keys to accident reduction include management action, employee training, insuring safe work conditions, and enforcement of safety rules. Too many managers place their emphasis only on complying with OSHA rules and not enough on recognizing, evaluating, and controlling the issues that could potentially hurt their employees.

Half-Truth: Safety is a cost control function.

Reality: Safety is a loss control function.

Many safety managers today have been placed in the position to reduce costs-worker's compensation, regulatory penalties and overhead. This is a long-term goal. Safety managers should recommend to management how to prevent employees from becoming injured or ill while on the job. Safety managers should also recommend ways to comply with regulations to limit health and environmental deterioration. These actions will cost money and management needs to understand that. Safety managers must educate management to understand that in the long run, loss control is a cost control function.

Adapted from UNCW - The Safety Newsletter

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Be Alert for Safety - Expect the Unexpected