

BioSide Lines

October 2004

The Newsletter of the Office of Biological Safety, UW-Madison Safety Department
www.fpm.wisc.edu/biosafety

Biosafety Concerns for Handling Immunocompromised Animals

Animals that have been treated with infectious agents clearly need to be handled with heightened precautions. In most cases, animals that have been administered risk group 2 (RG2) agents will be handled at animal biosafety level 2 (ABSL-2) and animals that have been administered RG3 agents will be handled at ABSL-3. But what about when animals are administered potentially-infectious material such as human or monkey cells?

Cultured tissues and cells from humans and some monkeys (Old World, e.g., macaques) are commonly thought to be a lesser hazard than cultures of infectious agents. Primary and established cells from these sources, however, should be handled as potentially infectious material. Human pathogens may be present; it is feasible to test for a few but not all of them. Furthermore, cells in culture may become contaminated during repetitive handling. Researchers typically use a biological safety cabinet when handling these cells for the purpose of preventing contamination; this precaution also serves to protect the researcher from exposure to pathogens that might be present. Biosafety Level 2 containment and precautions are warranted.

Animals can be immunocompromised due to genetic or environmental factors, including some chemicals/drugs and radiation. Immunocompromised animals pose an increased occupational risk compared to immunocompetent animals when they are exposed to infectious or potentially-infectious materials. Immunocompromised animals are more likely to allow an infectious agent to propagate and more likely to pass that infection on to other animals, animal handlers, and other personnel.

For these reasons, immunocompromised animals that have been administered potentially-infectious material must be handled with ABSL2 containment and precautions. ABSL-2 precautions include the following measures.

- Wear appropriate personal protective equipment – at minimum, gloves, lab coat, and protective eyewear.
- Use containment equipment for cage changes of small animals and for necropsy.
- Autoclave animal bedding prior to disposal.
- Avoid generating aerosols and splashes.

Additional recommended precautions for various biosafety levels can be obtained from our website.

PPE – What to Wear and Where to Wear It

You already know the importance of choosing the appropriate personal protective equipment (PPE) for the type of laboratory activity you are performing. But what about where to wear it and for how long? What do you do with it at break time, when you're going to talk to your friend in the lab downstairs or at the end of the day or week? What if it's visibly dirty or you know it's clean?

Where should you wear your PPE? You should wear PPE in the laboratory, animal care facility, or anywhere you are working with agents that could affect your health or the health of others. Think not only of yourself, but also how it could impact those working around you, some of whom might be immunocompromised and therefore more susceptible to diseases. Make sure everyone is aware of all agents in use in a laboratory at all times, so they have the choice to protect themselves.

If you are leaving the laboratory, leave your PPE in the lab as well, whether it's visibly contaminated or clean. The general perception is that it is contaminated. You may know that you just took those gloves out of the box and put them on, but the person in the hallway has no idea as to what you have been up to, and is especially concerned when you reach around them with your gloved hand and press the elevator button or turn the door knob. They may be thinking, "If you need to wear PPE to protect yourself, why aren't you protecting me, also?"

If you need to transport materials outside of your lab, do so by placing the material in a secondary container, which has been surface decontaminated to prevent exposure to yourself or anyone else during transport. Using a cart is an additional precaution that can be taken. Carry a clean pair of gloves with you to use, and then dispose of them prior to returning to the common corridor or elevator. After removing your gloves, be sure to wash your hands as well. And what about all those people you see wearing lab coats, in the hallways, office areas, rest rooms, even the cafeteria? Just think about it for a moment, do you really want to eat your lunch wearing the same lab coat you wore to inoculate bacterial plates or inject animals? Probably not. The same common sense goes for NOT wearing a lab coat. Do you really want to take those agents home to your family or friends on your street clothes? This is why we recommend wearing gloves and lab coats in the lab and leaving them there when not in use.

How long should you wear PPE and what should you do when it's dirty? We all know a person who wears the same dirty lab coat for weeks or even months or someone who wears the same pair of gloves all day or even all week to save money. OSHA requires that employers provide their employees with appropriate PPE and ensure that PPE is properly discarded, or, if reusable, that the employer provides the means for proper cleaning or laundering, repair and storage after use. It is important to note that lab coats should be sent to the laundering service periodically or when visibly soiled, but disposable gloves should never be washed and reused.

Washing gloves does not necessarily make them safe for reuse and can make gloves more susceptible to leaking and tearing. Also, wearing gloves for prolonged periods of time can cause them to develop leaks or small holes, which make them less effective at protecting the user. Once contaminated, gloves can become a means for spreading infectious or hazardous agents to yourself or others. How many times have you seen someone adjust their glasses, rub their nose or pick up the phone with gloves on, while working in the lab?

In summary, the intended purpose of PPE is to protect the worker from agents that may cause them harm. It also has the potential to spread these agents inadvertently to objects or people, both inside and outside the laboratory. Gloves and lab coats are perceived as contaminated and should be worn only in the appropriate areas. Proper use of PPE will protect you and others from the needless spread of laboratory contamination.

Negative Air Pressure in Laboratories

Air may become contaminated with volatile hazardous agents while traversing through a laboratory. Building ventilation systems are designed to direct the air from areas of low hazard through higher hazard areas and then to release the air outdoors without further recirculation. It is acceptable for air from offices and common areas like the corridor or break room to flow into a laboratory, but not vice versa. This negative pressure will assist in preventing laboratory contaminants from dispersing into public areas.

The air pressure in a building is balanced with the laboratory doors closed and it is critical that the doors be kept closed to maintain the negative pressure. Smoke tests demonstrate that pedestrians passing an open doorway will draw air out of the laboratory into the corridor.

The importance of air balance is commensurate with the hazard posed by the materials in use. In many labs, the room air exhausts directly from the highest hazard area (fume hood or biological safety cabinet) to the outside. A small piece of tissue paper taped to the fume hood sash can serve as a simple indicator that air is flowing into the hood. For the high risk biological laboratories, air pressure monitoring gauges and controls are installed so that it is easy for personnel to monitor and maintain this criterion.

Laboratories with biosafety cabinets or fume hoods are tested annually and those without inward directional airflow are reported to the building manager. Odor problems and excessive drafts are other indicators of an air balance situation that needs attention. Air balance problems should be reported to the building manager or CARS (3-3333) to generate a work order with the Sheetmetal Shop to have the situation rectified.

OBS Website (www.fpm.wisc.edu/biosafety)

The OBS website has recently undergone revisions to make it more compliant with accessibility standards. All of the documents that previously were available on the website are still there, but some of the URLs have changed. Please update your bookmarks.

Shipping Infectious Substance and Other Biological Materials

The Office of Biological Safety will provide training and certification for shipping Infectious Substance and other biological materials, with a focus on safety and regulatory compliance for research laboratories. The Department of Transportation requires that persons involved in shipping hazardous materials in commerce be trained and certified in proper handling of these materials.

Tuesday, October 12, 2004

Union South 1:30 – 3:30 p.m.

Refreshments will be served.

Registration is required. Contact OBS at 263-2037 or biosafety@fpm.wisc.edu.

All staff are welcome to attend this class for initial training or re-certification. Staff approaching their two-year expiration for certification will receive a notice in advance of that date. Computer-based training is available only for those who attended the class for their initial certification.

Basic Biosafety Class Offered

This class will give an overview of basic biological safety. Topics include: biosafety levels and biohazard containment, good microbiological techniques, waste disposal, risk assessment, and emergency preparedness. It is intended primarily for students and staff who are new to this institution and/or new to working with biological materials in a laboratory. Everyone is welcome to attend.

Wednesday, October 13, 2004

Union South 1:30 – 3:30 p.m.

Registration is required. Contact OBS at 263-2037 or biosafety@fpm.wisc.edu.

Contacts

General Contact	263-2037	biosafety@fpm.wisc.edu
Jan Klein	263-9026	jklein@fpm.wisc.edu
Margy Lambert	263-9013	mlambert@fpm.wisc.edu
Darren Berger	263-2187	dberger@fpm.wisc.edu
Colleen Urben	262-6670	curben@fpm.wisc.edu
Nancy Schensky	263-2037	nschensky@fpm.wisc.edu
Tom Kenney	263-2177	tkenney@fpm.wisc.edu