

# BioSide Lines

April 2002

The Newsletter of the UW Office of Biological Safety

## Select Agents

The recent bioterrorism mailings of anthrax spores have focused the spotlight on biological materials that have potential to be used as weapons. Through the biosafety protocol registration process, the Office of Biological Safety (OBS) maintains oversight of the use of these materials in research at UW-Madison. The criteria for submission of a protocol have always included pathogens and toxins. Recently, the list of criteria was expanded to specifically include select agents. What is a select agent and what regulatory requirements are triggered by their use?

Current federal oversight of potential biological weapons lies with the Select Agent Rule (42 CFR 72.6) under the authority of the Centers for Disease Control and Prevention (CDC). Part of this rule is the Select Agent List (Appendix A), which includes microbes and toxins deemed to be a threat to public health and safety. The list, too long to reproduce here, is accessible electronically at [http://www.cdc.gov/od/ohs/lrsat/42cfr72.htm#Appendix A](http://www.cdc.gov/od/ohs/lrsat/42cfr72.htm#AppendixA). This list is controversial but nonetheless, provides the basis for regulatory compliance.

The current Select Agent Rule pertains only to shipping and receiving these materials; use and possession currently are not regulated. A facility that is subject to the rule must register with CDC, a process that is coordinated by OBS for this campus. A permit, called an EA101, accompanies every shipment. Select agent users must meet federal standards for biosafety and security, specified in Biosafety in Microbiological and Biomedical Laboratories, a document published jointly by CDC and NIH. Additional recent regulation of select agents under the USA Patriot Act prohibits possession by "restricted persons."

Several state and federal regulatory proposals that would further restrict possession and use of hazardous materials are under consideration. OBS, in its role of facilitating compliance, will alert you to changes when they become effective. In all likelihood, the regulations will be extended to encompass registration of research facilities for possession. Please contact Jan Klein (263-9026) if you have questions about oversight of select agents.

## The "Hood"

In common laboratory (not street) usage, the term "hood" can refer to several different devices: the fume hood, the biological safety cabinet, and the laminar flow clean air bench. Just to add to the confusion some people also refer to a clean area of a laboratory bench as the "clean bench." The three containment devices provide very different types of protection.

Fume hoods draw air from the room over the work surface, diluting chemical vapors and exhausting the air directly outdoors. Although the work surface is "dirty," the worker is protected. Sash height and face velocity are critical parameters for proper operation of a fume hood. Fume hoods provide personal protection by controlling hazardous airborne materials.

Biological safety cabinets (BSCs) provide a near-sterile work environment and are suitable for handling pathogens. Air within the cabinet passes through two high efficiency particulate air (HEPA) filters, which trap particles as small as viruses, but are ineffective against chemical vapors. Limited amounts of chemicals may be used in BSCs that are hard ducted and exhaust the air directly outside the building. It is also acceptable to work with small amounts of many chemicals in BSCs that recirculate air back into the room. Chemicals that release toxic or flammable vapors, however, should not be handled in a BSC. BSCs control biological materials while providing personal, product and environmental protection.

Like BSCs, clean air devices/benches (CADs) use HEPA filtration to provide a clean work surface. The air that passes across the work surface of the cabinet is directed at the worker, exposing him/her and other nearby staff to any materials picked up by the air currents. A CAD should never be used for work with hazardous chemical or biological agents. We strongly discourage the use of CADs since they provide no personal or environmental protection.

While it is important to recognize the benefits and limitations of each of these containment devices, it also is critical to understand that the equipment alone cannot protect you if it is used improperly. None provide protect against contact hazards. Since these devices all depend on airflow, disturbances in the vicinity of the opening, like people walking past, can wash out the air stream and compromise containment. The certification process ensures that the device is functioning correctly and maintained properly.

The campus offers certification and maintenance of BSCs and CADs through the Environmental Health Program (262-1809). Fume hoods are tested annually by the Safety Department (Rhonda Lenerz, 262-1072) and maintained by Physical Plant (CARS, 263-3333). For proper selection of a containment device contact the Safety Department (Darren Berger, 263-2187).

Web-based training for fume hoods, BSCs and CADs will be available soon through the Safety Department website.

## **Bunsen Burners and BSCs**

The Bunsen burner is a tool of the trade for the classical microbiologist. Flaming flasks, tubes, and loops prevent contamination of microbial cultures when working on an open bench and satisfies the pyromaniac urge that lies deep within us. An open flame in a biological safety cabinet (BSC), however, rarely is needed and could lead to disaster. Some institutions have policies that ban gas line installations in BSCs. We strongly discourage their use.

A properly functioning BSC depends on laminar airflow to achieve a near-sterile work environment. A flame creates air turbulence and disrupts the air supply pattern, actually compromising the integrity of the containment. The heat, if allowed to build up, could damage the cabinet. A BSC can be terminally damaged by a spill of alcohol that catches on fire or an explosion resulting from a leak of natural gas. More importantly, personnel can be injured.

Several solutions are available. Having a supply of pre-sterilized inoculating loops and needles on hand eliminates the problems caused by a heat source in the BSC. If deemed absolutely necessary, sterilizing devices that don't provide a continuous open flame are preferable. Burners are available that have a pilot light and provide a flame only on demand. Small electric furnaces can be used to sterilize loops, needles, and culture tube mouths. Check your laboratory supply catalog for more information about these products. For example, Fisher Scientific sells disposable loops and needles, the Bacti-Cinerator® oven, and Touch-O-Matic® Bunsen burner.

## **Useful Resources on Hazardous Chemicals**

Hazardous chemicals often are integral components of biological research. Important information is included in the material safety data sheet (MSDS) provided by the vendor. The MSDS, however, tends to focus on the direct hazards of the substance and may fall short of providing relevant information in the research setting. Here are additional resources that you may find helpful.

National Toxicology Program - Chemical Health & Safety Information

*[ntp-server.niehs.nih.gov/Main\\_Pages/Chem-HS.html](http://ntp-server.niehs.nih.gov/Main_Pages/Chem-HS.html)*

National Toxicology Program - Report on Carcinogens

*[ntp-server.niehs.nih.gov/NewHomeRoc/AboutRoc.html](http://ntp-server.niehs.nih.gov/NewHomeRoc/AboutRoc.html)*

ToxNet *[toxnet.nlm.nih.gov/](http://toxnet.nlm.nih.gov/)*

Also, be sure to check the numerous links available through the UW System Chemical Safety Resources, [msds.uwsa.edu/](http://msds.uwsa.edu/)

## Shipping Infectious Substances and Other Biological Materials

The Office of Biological Safety will provide training and certification for shipping infectious substances 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, April 9, 2002

Union South 1:00 to 3:00 p.m.

Refreshments will be served.

### **Registration is required.**

Contact Margy Lambert at 3-9013 or [mlambert@fpm.wisc.edu](mailto:mlambert@fpm.wisc.edu).

Staff approaching their two-year expiration for certification will receive a notice in advance of that date. All staff are welcome to attend the class. Computer-based training is now available as an alternative, but only for those who have attended the class for their original certification.