



LabNotes

No. 85

SAFETY NEWS FOR UC SAN DIEGO RESEARCHERS

SPRING 2009

Ethidium Bromide Alternatives

Ethidium bromide, long used as an inexpensive, sensitive, and stable dye for staining nucleic acids, is a potent mutagen, possible carcinogen and reproductive toxin with significant health risks for researchers.

Ethidium bromide accounts for many decontamination and cleanup efforts by researchers and EH&S staff. UC San Diego generates about 16,000 pounds of solid waste and about 1,300 gallons of liquid waste containing ethidium bromide annually.

These disadvantages make safe and effective alternatives attractive for users.

Two alternatives, GelRed[®] and GelGreen[®] from Biotium, Inc., are safe for both the user and the environment. A safety report from Biotium states:

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Nanotechnology: Guidelines for Safe Research

University of California Lab Safety Work Group, a subcommittee of the UC Industrial Hygienists and Safety Steering Committee, has published an environmental, health, and safety information fact sheet for researchers working with engineered nanoparticles:

<http://ucih.ucdavis.edu/docs/NanoFactSheet.pdf>



UC's Lab Safety Work Group recommends incorporating the fact sheet as a standard operating procedure in each lab's chemical hygiene plan.

Choose Non-fabric Chairs for Labs

UC San Diego laboratories using biological materials, including biosafety level 1 (BSL-1) areas, must follow the lab furniture guidelines specified in the 5th edition of the CDC/NIH "Biosafety in Microbiological and Biomedical Laboratories" (BMBL5) manual (<http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm>).

The BMBL5 guidelines for biosafety levels 1 through 3 state that:

"Chairs used in laboratory work must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant."

This new requirement for BSL-1 facilities is already required in BSL-2 and BSL-3 labs (cloth-covered chairs are not allowed in these rooms). To ease the transition for BSL-1 labs, existing cloth-covered chairs may be grandfathered in if they are covered with non-porous material (a plastic slip cover will work). New chairs purchased for labs using biological materials must be made of non-porous material.

Questions? Contact ehsbio@ucsd.edu.

UV Lamps in Biosafety Cabinets?

Did you know that ultraviolet (UV) lamps are not permitted in biosafety cabinets (BSCs) at the National Institutes of Health? Centers for Disease Control and Prevention, National Science Foundation/ANSI, and the American Biological Safety Association agree that UV lamps are not recommended or necessary for decontamination in BSC's (also known as tissue culture hoods).

EH&S does not recommend using UV lamps for decontamination in UC San Diego biosafety cabinets.

Significant safety hazards and the germicidal limitations of UV light are compelling reasons to use safer, more effective decontamination methods. Safety hazards associated with UV light exposure include cornea burns and skin cancer. (An employee was recently exposed to UV light in a BSC resulting in burns requiring medical care.) Many factors adversely affect the germicidal activity of UV light, such as dust on the lamp bulb and hours of use.

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Voluntary N-95 Respiratory Protection Program

A campus department was recently asked by Cal/OSHA to show training records for employees who voluntarily use N-95 respirators, also known as filtering facepieces (see image).

Blink's Respiratory Protective Equipment Training page provides supervisors with tools for training and documenting voluntary N-95 use, including a PowerPoint presentation describing use and limitations, and N-95 standard operating procedures for UC San Diego personnel.



Note: This training applies only to voluntary N-95 use for respiratory protection against nuisance large-size particulates. If your use is mandatory, additional regulatory requirements such as hazard analysis and fit-testing must be completed.

See <http://blink.ucsd.edu/go/respirator> to learn more about respiratory protection at UC San Diego.

Questions? Contact EH&S Occupational Health & Hygiene at ehsih@ucsd.edu.

Safety Training: Enrollment Central

<http://enrollmentcentral.ucsd.edu>

Browse "EH&S—Safety" under Course Topics for schedules and registration. Learn more about safety training resources at <http://blink.ucsd.edu/menu/safetytraining>.



Please post or circulate

Ethidium Bromide Alternatives ... continued

"GelRed and GelGreen are a new generation of nucleic acid gel stains. They possess novel chemical features designed to minimize the chance for the dyes to interact with nucleic acids in living cells. Test results confirm that the dyes are impenetrable to both latex gloves and cell membranes. The dyes are noncytotoxic and nonmutagenic at concentrations well above the working concentrations used in gel staining. Furthermore, GelRed and GelGreen have successfully passed environmental safety tests in compliance with CCR Title 22 Hazardous Waste Characterization. As a result, GelRed and GelGreen are not classified as hazardous waste, thus can be safely disposed of down the drain or as regular trash, providing convenience and reducing cost in waste disposal."

If these products are acceptable alternatives in your research, EH&S encourages you to phase out ethidium bromide. You'll save important research time, reduce hazardous waste costs, and help make UC San Diego a safer and more sustainable campus.

Questions? Contact your Research Assistance Program specialist: <http://blink.ucsd.edu/go/rap/>.

Incompatible Wastes

A recent incident at another research institution involving the mixture of incompatible wastes had the potential to cause serious injury. Fortunately, nobody was present in the room when a 4-liter glass bottle of waste aqua regia (nitric and hydrochloric acids) violently exploded, destroying the bottle and the secondary containment, damaging other waste containers, shattering the fume hood sash, and scattering glass and acid mist throughout the room.

A researcher had poured waste isopropyl alcohol into the acid waste and closed the cap. Over the next 30 minutes the nitric acid oxidized the alcohol and pressure built up in the bottle until it exploded. Organic waste containers were stored in the same secondary containment as the oxidizing acid waste—a recipe for a fire. Fortunately, the red flammable liquid cans were not punctured and a fire was avoided.

Accidents involving inadvertent mixture of a strong oxidizer (nitric acid) and a fuel (isopropyl alcohol) are predictable and avoidable. Take steps to prevent it in your lab:

- Ensure personnel handling hazardous materials and generating waste receive appropriate, documented training.
- Use less hazardous materials if possible.
- Properly label and store incompatible chemicals separately.
- Inspect each waste container in your lab for gas generation potential.
- Include a safety step in your experimental protocols to quench any reactions, either by neutralization or dilution.

See <http://blink.ucsd.edu/menu/lab> on Blink for general chemical safety guidelines and hazardous waste handling procedures.

Questions? Contact your Research Assistance Program specialist: <http://blink.ucsd.edu/go/rap/>.



Properly labeled, capped waste in secondary containment.

UV in BSCs

... continued

A more effective strategy to reduce or eliminate contamination in BSCs includes careful microbiological procedures, good aseptic techniques, standard operational procedures for working in BSCs, and thorough decontamination procedures with a Cal/EPA registered disinfectant before and after BSC use.

EH&S Biosafety recommends using 10% household Clorox bleach (or other Cal/EPA registered disinfectant). Note: 70% ethanol is not a Cal/EPA approved disinfectant. It can be used as a cleaner, but not a disinfectant.

Reconsider the use of UV light in your BSC for safety reasons, cost savings, and to help make UC San Diego a more sustainable campus:

- Eliminate the expense of replacing UV lamp bulbs
- Save energy by not turning on the UV lamp in the BSC
- Reduce hazardous waste disposal costs (mercury content in UV bulbs makes them a universal hazardous waste)

Learn more about biosafety cabinet use on Blink's Biosafety page: <http://blink.ucsd.edu/menu/bio/>.

Questions? Contact EH&S Biosafety at ehsbio@ucsd.edu.

Win a Free Ergo Chair!

Rajeswari Pichika of Orthopedic Surgery and Joseph Tafur of Psychiatry are winners!

You could be next. Log in to Enrollment Central at <http://enrollmentcentral.ucsd.edu> and complete the Evaluating Your Computer Workstation for Comfort and Productivity Web-based training program. A winner is randomly drawn each month from a list of employees who have successfully completed the training during that month.

* Chairs awarded through this program are the property of the winner's UC San Diego department.