




# Environmental Health & Safety

## Safety Matters

### Red is the New Green-Reusable Sharps Containers

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In January 2009, EH&S took another big step toward reducing the environmental footprint of one more of the University's waste disposal programs. EH&S in partnership with CUMC Facilities and BioSystems, the University's vendor for sharps disposal, began the phased implementation of reusable regulated medical waste (RMW) sharps containers. Under the new program, reusable containers are retrieved from the laboratory by a BioSystems technician, transported to an off-site management facility where they are robotically emptied, sanitized, and returned to use. The new containers are sturdier than the single-use version and can be reused up to 500 times, eliminating a significant volume of plastic from the nation's already stressed landfills.

Since the program's inception at Morningside and the Hammer Health Sciences Center at CUMC, 1,600 pounds of plastic and 80 pounds of cardboard have been kept out of landfills. We have prevented the emission of 928 pound of CO<sub>2</sub>, the amount generated by burning fifty gallons of gasoline or using eighteen propane barbeque tanks.

### Reminder – recombinant DNA

The NIH Guidelines require that *all* work (regardless of funding support source) with recombinant DNA (rDNA), including *in vitro*-only projects, must be described in a submittal for review to the University's Institutional Biosafety Committee (IBC). To submit your lab's rDNA work: Go <https://www.rascal.columbia.edu>.

- ◆ Select 'Hazardous Materials' from the menu on the left side of the welcome screen
- ◆ Log in with your CU UNI and password
- ◆ Select and then complete **and save** "Recombinant DNA (Appendix A)" which can then **either** be attached to an IACUC protocol **or** submitted directly to EH&S for *in vitro*-only activities using rDNA.

### Follow the Yellow Bin Road- CTS Benchtop Yellow Bins

To ensure the effective function of the ChemTracker program at Morningside, all empty bar-coded containers must be deposited in the large yellow ChemTracker bins so they can be properly scanned out of active inventory. To assist labs with the efficient handling of small, empty bar-coded containers, before depositing them into the large yellow bins, EH&S offers small two gallon yellow bins that can be kept on the bench to collect multiple small containers. If interested in one of these smaller containers, please submit a chemical waste pick up request (<http://vesta.cumc.columbia.edu/ehs/wastepickup/>) and note in the comment section the number of containers needed.

#### ENVIRONMENTAL HEALTH & SAFETY

WEBSITE:

[HTTP://EHS.COLUMBIA.EDU/](http://ehs.columbia.edu/)

#### MEDICAL CENTER

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#### MORNINGSIDE CAMPUS

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## Lessons Learned – Fume Hood Fire

### EPA AUDIT

THE HAZARDOUS WASTE MANAGEMENT PROGRAM ON THE MORNINGSIDE CAMPUS WAS RECENTLY SUBJECT TO AN UNANNOUNCED EPA AUDIT. NOT ONLY WERE NO VIOLATIONS ISSUED-A RARITY FOR SUCH VISITS-BUT THE PROGRAM WAS RATED 'EXCELLENT' BY THE AUDITOR. WE WOULD LIKE TO EXPRESS OUR APPRECIATION TO ALL PARTIES WHO PLAY AN IMPORTANT ROLE IN THE DAY-TO-DAY OPERATIONS OF THIS PROGRAM, ESPECIALLY THOSE OF YOU WHO HAVE DIRECT RESPONSIBILITY FOR INITIATING THE PROCESS ON THE LABORATORY BENCH LEVEL.

A small fire in one of our laboratories involving the pyrophoric reagent, lithium aluminum hydride, in an ethyl ether solution, was quickly extinguished without any injuries. A student was using a three-neck flask under a nitrogen gas line to slowly add powdered tiglic acid, which produces an exothermic reaction. Under normal circumstances, the very gradual addition of the tiglic acid will not cause the release of an excessive amount of energy. However, the tiglic acid had not been thoroughly homogenized and a large clump fell into the flask. Releasing much of the pyrophoric solution over the interior of the fume hood, where it quickly caught fire.

Rapid response by the student prevented this small fire from becoming a major incident. When it quickly became evident that the fire was too large to simply smother, the researcher grabbed one of the lab's fire extinguishers and promptly quenched the flames. The lab then contacted EH &S to report the incident. This near-miss highlights the importance of:

- ◆ Knowing the hazards associated with substances you are working with.
- ◆ Taking extra precaution when using air-reactive or pyrophoric reagents, especially when performing a procedure that involves an exothermic reaction.
- ◆ Taking extra care to ensure that the procedure is carefully controlled, especially when performing any experiment that involves any heating of a flammable substance.
- ◆ Knowing the location of safety equipment, such as the fire extinguisher, and how to use it.
- ◆ Working with the buddy system-never work alone with hazardous materials.
- ◆ Attending Laboratory Safety and Fire Life Safety training before working in the laboratory (<http://ehs.columbia.edu/Training.html>).

## Happy Anniversary!

### 665 gallons of acetone recycled and reused in the past year

During the first year of the acetone recycling program in the Department of Chemistry at Morningside, EH&S recycled and returned to use 655 gallons to participating labs. This successful program has saved the University thousands of dollars on new purchases and waste disposal, and reduced its environmental footprint by diverting the equivalent of twelve 55 gallon drums of acetone waste from traditional incineration disposal. The next twelve months seems even more promising as we are on a pace to recycle and reuse close to 1,000 gallons.

We hope to build on this success and the 8-plus years of successful xylene and ethanol recycling in CUMC's Pathology and Dermatopathology laboratories, where more than 3,000 gallons are recycled and reused each year, by investigating additional recycling opportunities for other Recycling website for information on other initiatives: <http://ehs.columbia.edu/Recycling.html>.



For Lab Fire Safety Prevention tips, check out: FDN(wh)Y Me @ <http://ehs.columbia.edu/FDNYMe.html>

## Personal Protective Equipment

Every year, on-the-job lab injuries occur that often could have been prevented with the use of appropriate personal protective equipment (PPE).

Start with the clothing choices you make at home; personal clothing can provide a measure of protection against hazardous materials. Closed-toe shoes protect against chemical splashes, sharp objects, hot materials, and falling objects. On warmer days, people are inclined to wear shorts, t-shirts, and flip flops but any clothing that leaves large areas of skin exposed is inappropriate. Long hair, dangling jewelry, and loose fitting clothing should be also protected or removed while in the lab.

Lab coats, gloves, and safety eyewear constitute basic lab PPE. A buttoned lab coat must be worn whenever chemicals or biological materials are handled. It must be replaced if ripped or torn, and cleaned regularly.

Gloves must be worn whenever handling any quantity of hazardous materials. No chemical resistant glove protects against all chemicals. Read the Material Safety Data Sheet (MSDS) for guidance on glove selection, or consult with lab supply distributors for information on the chemical resistance of glove materials. See <http://msds.chem.ox.ac.uk/glovesbymaterial.html> for one such resistance guide.

Eye protection is the most under-utilized type of PPE, but considering that your eyes are your most sensitive 'exposed skin', safety glasses or goggles must be used for work with ANY hazardous materials regardless of the physical state or quantity. Face shields provide additional protection for work with larger volumes of material or cryogenics such as liquid nitrogen.

Remove all PPE before leaving the laboratory area. For Columbia University laboratories - PPE Requirements can be found in your CU Health & Safety Manual or online at <http://ehs.columbia.edu/LabSafety.pdf> and can be used and supplemented as appropriate.

### SAFETY TRAINING

SEE [HTTP://WWW.EHS.COLUMBIA.EDU/TRAINING.HTML](http://www.ehs.columbia.edu/training.html) FOR SCHEDULES OF LAB-BASED TRAININGS, PARTICULARLY **NOW** WHEN MANY STUDENTS AND RESEARCHERS ARE BEGINNING WORK IN COLUMBIA LABS.

## Oxygen Sensor Update

You may have started to see these small boxes mounted in some laboratories around campus. "What are they?" you ask. They are Oxygen Sensors! The NYC Fire Department Fire Code requires that where there are sixty gallons or more of cryogenic liquids are used or stored, including in dewars, an oxygen sensor be installed. As we know, cryogenic liquids can rapidly displace oxygen if the container should leak, causing an unsafe atmosphere.

- ◆ Normally the unit will read 20.5% indicating a safe level of oxygen in the area. If the reading should go below 19.5% or above 23.5 %, the unit's alarm will sound, warning that the area should be evacuated due to unsafe levels of oxygen.
- ◆ **Do not enter any area where the alarm has activated.**
- ◆ Contact Public Safety and wait in a safe area for their arrival or instructions. Please read and become familiar with the following materials regarding Oxygen Sensing equipment, which can be found on the EH&S website:

[Environmental Health & Safety Response to Oxygen Deficiency Sensing Equipment in Laboratories](#)

Environmental Health & Safety has conducted a survey of laboratories on both campuses to identify areas that require the Oxygen Sensors. We have collaborated with Tech Air to purchase, install, and maintain the oxygen sensors at a nominal monthly cost to the laboratory. In the next few weeks, you may see the installer in your labs. **Please do not unplug the units after they have been installed.**

If you have any question regarding the Oxygen sensors, please contact EH&S.



Oxygen Sensor

EH&S  
Website:  
<http://ehs.columbia.edu>

## Indoor Air Quality: Molds-Leaks-Response

Molds are environmentally ubiquitous organisms that routinely populate indoor and outdoor environments; nearly anywhere one looks for mold, it will be found. For this reason, testing for molds is not recommended when aberrant mold amplification is suspected. Following water leaks or other events that create conditions conducive to mold growth, the first and most crucial step is to stop the water intrusion. Then, all affected items must be thoroughly cleaned and completely dried; items that cannot be cleaned and dried quickly should be discarded. Rarely, materials will exhibit mold growth as a result of water intrusion, and the response will depend on the extent of the growth. Walls with fewer than 10 square feet of visible mold can be cleaned with a surface-compatible cleaner and disinfectant and repainted, whereas extensive involvement may necessitate removal of affected sections. Water damaged ceiling tiles must be quickly replaced.

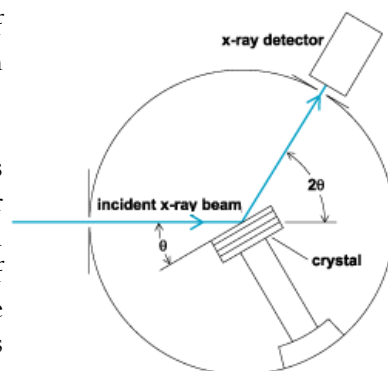
If your work area has been impacted by water, contact Facilities as soon as possible. Rapid response in these situations can prevent an easily manageable situation from becoming more complex. Furthermore, keep in mind that healthy individuals are rarely sickened by the presence of small amounts of mold typical of minor water intrusions. For more information on mold and your health, and on the decision-making process surrounding mold remediation, please see the following websites and documents:

- ◆ NYC DOHMH's "Guidelines on Assessment and Remediation of Fungi in Indoor Environments" <http://www.nyc.gov/html/doh/html/epi/moldrpt1.shtml#enviro>
- ◆ Columbia University Water Intrusion Policy <http://ehs.columbia.edu/WaterIntrusionPolicy.html>

## X-ray Diffraction Machines: Uses and Hazards

X-ray diffraction machines are used throughout Columbia University. The scattering of x-rays in different directions due to interference effects by matter with accompanying variations in intensity makes these machines a powerful tool in determining the atomic arrangement of matter. Photos of the X-ray diffraction patterns of crystallized DNA by Rosalind Franklin enabled Watson and Crick to make the critical leap that led to their elucidation of the double helix!

The x-rays used most commonly in these machines are of short wave length, known as "soft" x-rays that are readily absorbed in matter. Soft x-rays are easily shielded, however they are very dangerous when absorbed in soft tissues and severe burns can result from exposure of the hands, arms, skin or eyes to the direct or diffracted beams. Because of the potential for harm, all x-ray diffraction machines at Columbia University must have interlock switches and warning lights. Effective shielding must be used, film badges must be worn, and radiation safety training must be completed. For more information please contact EH&S at (212) 854-4442.



## A student had a bad day

A student had a bad day, when an experiment reacted in an unforeseen manner...

Luckily, the student was wearing a proper lab coat, and was able to rapidly undo the snaps, and drop the lab coat when flaming solvent from the fumehood splashed out and landed on the bottom half of the lab coat.

What would the lower body have looked like, if this person had been wearing a pair of polyester shorts?

