

## Working Alone in the Laboratory

The easiest response is never work alone in a laboratory, but the 24/7 pace of science and around the clock access to research facilities lend itself to this situation. Most of the work performed off-hours in the laboratory is similar to that being performed during the day. However, accidents and incidents can just as soon happen when you are in a bustling lab as they can when you are working alone. The principle difference is access to colleagues who can assist with the prompt initiation of emergency response procedures, and quicker access to a greater number of trained campus emergency response personnel during normal working hours. In a situation where every second counts, anyone contemplating working alone off-hours should satisfactorily address all of the following prior to doing so.

- Make sure you have authorization from your Principal Investigator (PI) to perform the proposed work off-hours.
- Review laboratory procedures with the PI to cover:
  - Training and experience;
  - Controls to contain the hazards;
  - Adequate personal protective equipment;
  - Emergency response procedures and contact information for hazardous materials incidents (exposures, spills, fires etc.);
  - The location of the nearest eye wash, shower, and fire extinguisher.



It is important to note that hazardous work requires the presence of a 2<sup>nd</sup> person who is knowledgeable in the procedure. Such work could include experiments involving toxins or highly toxic chemicals, reactive materials, corrosive chemicals and large scale work with any hazardous materials.

Ensure that others know where you are, what you're doing, and when you're expected to leave the laboratory. Have someone call periodically to check in on you when working along. Be that there are campus safety services to escort you to your vehicle or nearby location done working.

Ensuring that others know where you are and how long you're likely to be in the lab is a very important point to remember. Aron Ralston, author of the book "Between a Rock and Hard Place" (Atria Books, New York, NY; 2004), describes his ordeal when he was stuck in a canyon crevice for over 5 days during an outdoor adventure he planned himself. Regrettably, this experienced outdoors person never told anyone where he was going. Don't get stuck between a rock and a hard place. Be sure to plan for your safety before beginning your research experiments.

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<b>Emergency Contact Information: Yale Police:</b>	<b>911 from a campus phone 432-4400</b>
<b>Yale Security:</b>	<b>785-5555</b>
<b>EHS Emergency Line:</b>	<b>785-3555</b>

## The Proper Place For Electronic Waste



**There is a proper way to dispose of electronic waste. And it couldn't be easier!**

If your department has computers, fax machines, phones, iPads, iPods, printers or any other used electronic equipment used to store or transfer information or used for entertainment purposes, please use EHS's online system to request their removal.

Log in at: <https://universalwaste.med.yale.edu/user> and complete your request today!

Please do not discard your electronic waste in the normal waste stream.

## Freezers and Frozen Samples

Depending upon their severity and duration, electrical power outages can have serious consequences on laboratory operations. Besides curtailment of work, power outages may also place critical frozen specimens at risk by thawing. Thankfully, extended outages are rare, but they can and do occur. Given the high scientific value of many stored specimens, researchers are reminded of the following:

- Freezers, especially -80 C units, should be on a service contract with original supplier or third-party provider. Contact Procurement for assistance.
- Do not cover freezers with equipment or supplies that could affect cooling coils.
- Keep an accurate inventory of contents to minimize door-open times, periodically review, and remove items no longer needed.
- Critical freezers should be placed on remote temperature monitoring systems. Contact Procurement for details.
- In the event of an actual power outage, keep freezers closed to maximize thaw times. Outages of less than 2 hours should have no appreciable effect on any freezer, and those up to 8 – 10 hours (provided doors remain closed) should not result in significant damage to most biological specimens.
- For longer duration outages, subsets of critical specimens should be relocated to units on back-up power. Alternatively, dry ice can be added to slow the rate of thaw. Do not roll freezers around to different electrical outlet.
- Keep in contact with your business manager for updates on the outage and estimates for service recovery.

Since power outages are neither the only nor even worst-case emergency imaginable, prepare for future emergencies by working with your business manager / administrator on your unit's emergency preparedness and continuity of operations plan. And for truly irreplaceable specimens of all kinds, establish true redundancy by backing them up locally and elsewhere.

*Environmental Health and Safety is a resource of highly trained safety professionals who serve the entire community. We are dedicated to reducing injuries, accidents and environmental impact, and ensuring compliance. We achieve this by providing high quality training, comprehensive workplace evaluation, managing regulatory information, emergency response and hazardous materials management from acquisition to disposal.*

**EVALUATION • RESPONSE • COMPLIANCE  
HAZARDOUS MATERIALS MANAGEMENT • TRAINING**

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## Snow Removal

Most people think of snow removal as just another task, but it really involves a lot of bending and heavy lifting, especially if the snow is wet; just 15 minutes of shoveling can qualify as moderate physical activity. So, don't overdo it. In 2007, more than 118,000 people were treated for injuries associated with manual snow and ice removal. Types of injuries included sprains and strains, particularly in the back and shoulders. Researchers also reported an increase in the number of fatal heart attacks after heavy snowfalls. The rise may be due to the sudden demand on the heart; snow shoveling often causes a quick increase in the heart rate and blood pressure.

So, let's consider a few simple tips to reduce our chance of injury:

- If you are inactive and/or have a history of heart trouble, consult your doctor before you take on the task of shoveling snow.
- Be prepared: Spray your shovel with silicon or Pam when it is dry. This will help keep the snow from sticking to the shovel. The more snow that stays on the shovel, the heavier it gets and the more chance for injury and frustration.
- Do a warm up: A few minutes of stretching can save you a lot of pain later.
- Dress appropriately: Layered clothing will keep your muscles warm and flexible. You can then shed a layer if you get too hot. Gloves should cover your wrists; if your wrists get cold, blood flow will cool your fingers, hands and arms too.
- Stay hydrated: Avoid drinking caffeinated beverages and energy drinks. They tend to dehydrate you and possibly elevate your heart rate.
- Use the right size shovel: Your shovel should be about chest high, allowing you to keep your back straight when lifting. NOTE: save your money, don't buy a fancy ergonomic shovel. Studies have shown that some have a hooked end that is too deep, causing you to twist to unload the shovelful of snow, hurting your wrists.
- When shoveling, stand with your feet slightly apart with one foot a little ahead of the other. Try to avoid twisting your body as you lift. If you are right handed you may find it best to have your left foot slightly forward, left hand close up to the shovel blade, and right hand on the rear handle. Upon loading the shovel you would then swing to the left to unload, in one fluid motion.
- Clear snow early and often; begin when a light covering is on the ground to avoid trying to clear deep, packed, heavy snow.
- MOST IMPORTANTLY: Listen to your body. Stop if you feel pain or are uncomfortable.

And finally, something to consider: After having lived in New England all his life, an elderly gentleman decided to retire. To his friends surprise he tied his snow shovel to the front of his car. When asked why, he replied that he intended to drive south until he came to a town where someone would ask: "what is that tied to the front of your car?", he would then stop and live there the rest of his life!



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## Reporting Biohazard Incidents

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Although we all want to prevent laboratory incidents, this brief article is a reminder for lab staff of the requirement that all laboratory incidents (e.g. spills, exposures and injuries) involving biohazards must be immediately reported to EHS, your Principal Investigator or lab manager, and Employee Health. Please ensure that basic emergency procedures are followed prior to making the immediate report. Individuals who are exposed to biohazards must immediately wash the affected area for 15 minutes (soap and water wash for punctures and use of an eye wash to address exposures to facial mucous membranes). Please ensure that the laboratory (small cell culture rooms) or immediate spill area (larger open lab spaces) is evacuated of personnel for at least 30 minutes to allow aerosols to settle before attempting to clean and disinfect the spill. More detailed information on responding to biohazard exposures and spills can be found by visiting the EHS links provided below.

The principal regulatory requirement for reporting incidents rests with the NIH recombinant DNA Guidelines (rDNA Guidelines). Reporting is a condition of funding extended to ALL Yale labs under the rDNA Guidelines, regardless if your lab receives NIH funds or not.

**Any spill, accident, injury or exposure involving Risk Group 2 (BSL2) or higher Biohazard or rDNA materials must immediately reported to EHS** (for subsequent reporting to the Biological Safety Committee and the NIH Office of Biotechnology Activities).

Please notify the Environmental Health & Safety Biosafety Office at 203-785-3550, or the EHS emergency line at 203-785-3555 to initiate the review and the notification process if you are involved in an incident. Finally, all injuries and exposures must be documented on a Yale University Employee First Report of Injury Form. A link to this form is also provided below.

### Yale Emergency Response Phone Numbers:

EHS Emergency Phone Lines:	785-3555 (Business Hours) 432-4400 (Off-Hours)
Immediate Assistance:	911 (Any Yale Phone)
Acute Care – Yale Health:	432-0123
Yale Employee Health:	432-7978
Yale Police Dispatcher:	432-4400

### Emergency Information Online:

#### EHS Biohazard Spill & Exposure Response info

[http://www.yale.edu/ehs/emergency\\_subpage.htm](http://www.yale.edu/ehs/emergency_subpage.htm)

#### Yale University Employee First Report of Injury Form (Worker's Compensation Office)

[http://www.yale.edu/finance/controller/riskman/accident\\_forms.html](http://www.yale.edu/finance/controller/riskman/accident_forms.html).

Information on the appropriate response for other laboratory incidents (Chemical Hazard or Radiation Hazard) can be accessed at:

<http://www.yale.edu/ehs/emergency.htm>.

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## Cold Weather Work

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Extreme temperatures like those we face in Connecticut in the winter can cause problems for us at work or at play. These problems may include: trouble breathing, fatigue, reduced dexterity, sensory sensitivity, and reduced grip strength. Cold temperatures make the muscles less flexible, resulting in muscle strain and pulls. Cold work environments can be encountered in areas besides the outdoors. Any location that is outside of the typical comfort zone of 55 to 85 degrees F is cause for consideration.

Low temperatures can impact performance of complex mental and physical tasks and may even lead to potentially lethal effects. A cold environment takes away body heat which results in a lowering of the inner body temperature to dangerously low levels. HYPOTHERMIA is a common cold injury associated with low body heat. This occurs when the body loses energy faster than it is produced, dropping the body temperature. Warning signs are numbness, stiffness, drowsiness, and poor coordination. FROSTBITE is another common cold injury. The nose, ears, cheeks, fingers, and toes are the most often affected. The low temperature constricts blood vessels, which impairs blood flow and may cause permanent tissue damage. If damage is only to the skin and underlying tissue, complete recovery may be expected. However, if blood vessels are affected, the damage may be permanent and severe cases could result in amputation.

To cope with working in a cold environment you should stay active, dress warmly, and follow basic safety rules. Some cold weather work increases the risk of back injuries and other musculoskeletal injuries. Perform “warm up” stretching exercises before doing heavy work or handling heavy equipment and material. Important points to remember are:

- Dress in multiple layers of loose, dry, protective clothing,
- Ensure that your hands, feet, face, head, and eyes are covered,
- Avoid getting wet,
- Keep moving,
- Take regular breaks in a warm location.

For more information see <http://www.yale.edu/ergo/extremetemp.html>.

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# Incident Report

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A small sampling of incidents Yale EHS responded to during the past few months...

## November, 2010

### *Description: acid spill and splash to arm*

A person working alone in a research lab at night spilled concentrated acid solution in the hood, and some splashed onto her arm and hand. She required assistance from a researcher from a different lab who called 911 and guided her to the emergency shower.

### *Resolution:*

The researcher was taken by ambulance to the hospital where she was treated and released a few hours later. The NHFD neutralized the spilled acid, and EHS emergency responders cleaned up the spilled material. Custodial services cleaned up the water from the emergency shower.

### *Lessons Learned:*

Incident stressed the importance of not working with hazardous materials alone, especially off-hours. EHS met with laboratory personnel and re-trained staff on emergency procedures, personal protective equipment requirements, and off-hours policies, and all lab staff were required to re-take the on-line chemical safety training course.

## December, 2010

### *Description: mercury in vacuum pump oil*

A researcher was draining the oil from a vacuum pump into a waste container and noticed mercury coming out with the oil. He stopped work and contacted EHS.

### *Resolution:*

EHS evaluated area, cleaned up a few small droplets near the floor, and disposed of the pump and mercury contaminated oil as hazardous waste. Air monitoring after cleanup confirmed that all mercury had been cleaned up and area was safe to re-occupy.

### *Lessons Learned:*

Always be alert when handling vacuum pumps and look for signs of mercury when draining oil from older pumps. Stop work and contact EHS if evidence of mercury is found.

## January, 2011

### *Description: broken bottle of corrosive liquid*

A researcher was placing a 4L bottle of hydrochloric acid into the corrosive cabinet beneath the fume hood when it bumped another bottle and broke. EHS was contacted for assistance in cleaning up this large spill, which luckily was contained inside the tray in the cabinet.

### *Resolution:*

EHS arrived and neutralized the spill, absorbed the liquid, and cleaned the corrosive cabinet base.

### *Lessons Learned:*

Corrosive liquids should be purchased in safety coated glass containers or plastic bottles. These are all available through Sciquest. Safety coated containers are designed to prevent liquid from spilling because they will shatter, but not break, if dropped or bumped.

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## Are You Working in a “Green” Lab?

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As of December 2010, fifty five laboratory areas on campus have signed up for the Green Laboratory Certification program. These lab groups have completed the on-line questionnaire in which they documented the current sustainable practices that have been implemented in their lab areas. Of the 55 labs, 38 of them have been awarded the Y-A-L level of certification, 10 have earned the Y-A level and 7 have earned the Y level. Areas at West Campus, Amistad, 300 George Street, Environmental Science Center, Chemistry Research Building and many others are currently working towards the full Y-A-L-E level of top green laboratory certification.

The certification process requires each lab to propose additional sustainable practices that are not included in the survey. The write-in initiatives that we have received have been excellent. Examples include bringing reusable bags to the stockrooms, saving and reusing shipping packing material, using autoclavable glassware instead of one time plastic use and even bringing reusable containers to the food carts to avoid Styrofoam containers.

We are pleased at the initial response and urge you to sign up for the program or to resubmit your survey when additional sustainable practices have been instituted. We also welcome feedback and ideas to enhance this program. Please email us at [greenlab@panlists.yale.edu](mailto:greenlab@panlists.yale.edu). To access the survey please visit [www.yale.edu/ehs/sustainability/greenlabs.html](http://www.yale.edu/ehs/sustainability/greenlabs.html).

# EHS Safety Training Information

## Biosafety Training

Mandatory for employees prior to initiating work with agents classified at Biosafety Levels 1 and 2. Available online and classroom.

## Biosafety Level 3 Initial

Mandatory for employees prior to initiating experiments with agents classified at BL2+, BL3, or BL3+. Classroom only.

## Bloodborne Pathogens

Required annually for laboratory and clinic personnel working with human materials, including blood, body fluids, unfixed tissues, human cell lines or bloodborne pathogens. Available online and classroom.

## Chemical Hazardous Waste Training

This is an interactive training course in chemical waste management on the proper collection, storage and labeling of chemical wastes. Available online only.

## Chemical Safety for Laboratory Personnel

This required training covers the hazards of chemicals in the workplace, including information on hazard classes, exposure limits, and personal protective equipment. Available online and classroom.

## Dry Ice Training

This mandatory course is designed to fulfill performance-specific training requirements for employees sending, transporting, or receiving dry ice with no other hazardous materials. Retraining is required every two (2) years.

## Formaldehyde Training

Training is required for all workers who are exposed to formaldehyde. This training must be completed annually.

## Office and Workplace Ergonomics

If your job requires frequent or heavy manual lifting or if you need information on the setup of a workstation and the prevention of repetitive motion injuries, review the "**Ergonomics @ Yale**" website.

## Powered Industrial Vehicles

This annual training is mandatory for personnel who operate a powered industrial vehicle or PIV. Call 203-785-3211 to schedule.

## Radiation Safety Training

Mandatory two (2) part training: Basic and Applied, for personnel working with radioactive material or frequenting an area where radioactive materials are stored or used. Employees must first complete the online session "Radiation Safety Basics-Part I" prior to enrolling in the classroom session.

## Respiratory Protection

Respiratory protection training and fit testing is required initially and annually for all respirator wearers.

## Safe Use of Biological Safety Cabinets

This training reviews the biological safety cabinets, their limitations, proper use techniques, and certification and repair procedures. This is a classroom only training.

## Safety Orientation for Non-Lab Personnel

This course combines three required training classes for non-laboratory personnel: Bloodborne Pathogens, Chemical Safety, and Radiation Safety. This training fulfills the annual requirement for bloodborne pathogen training. This is a classroom only training.

## Shipping Infectious Substances – Category A

This is a mandatory course designed to fulfill performance-specific training requirements for employees who do any of the following: package, label, ship, prepare shipping documents, offer packages of hazardous materials to carriers for shipment, transport and/or receive infectious substances. This also fulfills the requirement for shipping materials classified as Biological Substance, Category B, Exempt Human and Animal Specimens and Dry Ice training. Retraining is required every three (3) years.

## Shipping Biological Substances – Category B

This is a mandatory course designed to fulfill performance-specific training requirements for employees who do any of the following: package or label shipping materials, prepare shipping documents, offer packages of hazardous materials to carriers for shipment, or transport and/or receive biological substances. This training fulfills the requirements for shipping dry ice. Retraining is required every three (3) years.

## Tuberculosis Awareness Training

TB training is mandatory for personnel in a clinical setting with potential exposure to TB positive patients. Available online or classroom.

## EHS Web Trainings

### Air Emissions Training

[www.yale.edu/ehs/online/airmissions/airmissions.htm](http://www.yale.edu/ehs/online/airmissions/airmissions.htm)

### Biosafety Training

[www.yale.edu/ehs/online/BiosafetyPart1/BiosafetyPart1.htm](http://www.yale.edu/ehs/online/BiosafetyPart1/BiosafetyPart1.htm)  
[www.yale.edu/ehs/online/BiosafetyPart2/BiosafetyPart2.htm](http://www.yale.edu/ehs/online/BiosafetyPart2/BiosafetyPart2.htm)

### Bloodborne Pathogens for Lab Personnel

<http://info.med.yale.edu/bbp>

### Bloodborne Pathogens for Clinical Personnel

<http://info.med.yale.edu/bbpclinical>

### Chemical Hazardous Waste Training

[www.yale.edu/ehs/online/hazwaste/chemicalwaste.htm](http://www.yale.edu/ehs/online/hazwaste/chemicalwaste.htm)

### Dry Ice Shipper's Training

[www.yale.edu/ehs/Documents/training/dryice.pdf](http://www.yale.edu/ehs/Documents/training/dryice.pdf)

### Formaldehyde Training

[www.yale.edu/ehs/online/formaldehyde/formaldehyde.htm](http://www.yale.edu/ehs/online/formaldehyde/formaldehyde.htm)

### Laboratory Chemical Safety

<http://info.med.yale.edu/chemsafe>

### Laser Safety Awareness

[www.yale.edu/ehs/online/laser/lasersafety.htm](http://www.yale.edu/ehs/online/laser/lasersafety.htm)

### Organolithium Compounds Training

[www.yale.edu/ehs/online/OrganoLithium/OrganoLithium.htm](http://www.yale.edu/ehs/online/OrganoLithium/OrganoLithium.htm)

### P. I. Orientation of Yale's Biological Safety Manual, Procedure & Policies

[www.yale.edu/ehs/online/Biosafety/BioAdmin.htm](http://www.yale.edu/ehs/online/Biosafety/BioAdmin.htm)

### Safe Use of Biological Safety Cabinets

<http://www.yale.edu/ehs/online/safetycabinet/safetycabinet.htm>

### Shipping Infectious Substances – Category A

<http://www.yale.edu/ehs/online/categorya/categorya.htm>

### Shipping Biological Substance – Category B and Exempt Human or Animal Specimens

<http://www.yale.edu/ehs/online/categoryb/categoryb.htm>

### Radiation Safety Training

Radiation Safety Basics–Part I Web Training  
[www.yale.edu/ehs/online/RadiationSafety/RadiationSafety.htm](http://www.yale.edu/ehs/online/RadiationSafety/RadiationSafety.htm)

### Radiation Safety for X-Ray Technologists

[http://www.yale.edu/ehs/powerpoint/radtechs\\_files/frame.htm](http://www.yale.edu/ehs/powerpoint/radtechs_files/frame.htm)

### Tuberculosis Awareness

[www.yale.edu/ehs/online/TB/TB.htm](http://www.yale.edu/ehs/online/TB/TB.htm)

### Universal Waste

[www.yale.edu/ehs/online/universalwaste/universalwaste.htm](http://www.yale.edu/ehs/online/universalwaste/universalwaste.htm)

### Workplace and Office Ergonomics

<http://www.yale.edu/ergo/>

### X-Ray Diffraction

[www.yale.edu/ehs/online/xraydiffraction/xraydiffraction.htm](http://www.yale.edu/ehs/online/xraydiffraction/xraydiffraction.htm)

## Yale Environmental Health & Safety

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[www.yale.edu/ehs](http://www.yale.edu/ehs)

The EHS training room is located in the lower level, Room 15, at 135 College Street. To find out upcoming classroom session date and times, visit Yale's training website at: [www.yale.edu/training](http://www.yale.edu/training) or call EHS at 203-785-3211. EHS offers a wide variety of safety trainings in classroom sessions as well as online. Be sure to complete your Yale training assessment at: [www.yale.edu/training](http://www.yale.edu/training) to find out what type of training is required for your job duties.