ENVIRONMENTAL HEALTH AND SAFETY

Lab Chatter

UNIVERSITY OF NEW ENGLAND
INNOVATION FOR A HEALTHIER PLANET

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Safety Spotlight

The Benefit of Attending Lab Safety Inspections | By Jessica Tyre

Each semester every UNE laboratory goes through an EHS lab safety inspection. An EHS staff member comes with a checklist of items to review to make sure UNE labs are compliant with state and federal regulations in regard to employee, visitor, and volunteer safety and health. In most cases the lab's Principal Investigator (PI) or a lab designee will attend the inspection in case EHS has questions or if they would like to go over proper lab safety regulations. EHS staff reach out to lab PI's through email to schedule inspections; if there is no response after two attempts, EHS staff conduct the inspection without the PI present. However, it is much more beneficial for the process if the PI or a designee attends the inspection for several reasons:

1) If EHS has questions about lab practices or physical items in the room the individual is there to explain why they may do things a certain way and they can discuss whether the current practice is appropriate or what changes may have to be implemented to improve safety and health in their area.

2) Deficiencies can be corrected at the time of the inspection. If a hazardous waste SAA log is not filled out or a contact card is lacking information, or signage is not right, these items can be corrected with the PI's help during the inspection.

3) Specific safety initiative assistance can be provided to EHS to increase accuracy. For example, projects such as the fridge/freezer ID cards having the PI present is extremely helpful in accurately depicting the contents of an appliance. There are other projects that come up each semester where having a person familiar with the lab present is invaluable.

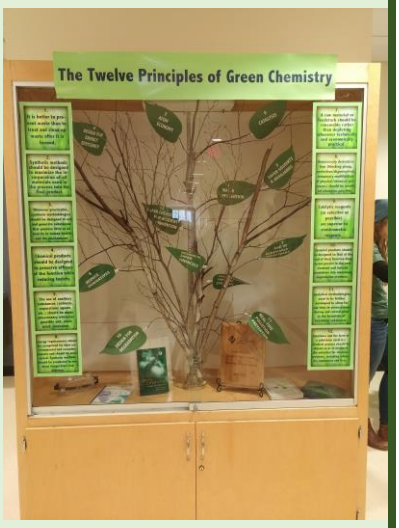
4) Enhances communication between lab workers and EHS. It is very helpful for EHS to know what types of work is being performed in each lab so they can fully understand how to protect room and building occupants. The more knowledge we have of operations and hazards, the more assistance we can provide. This also helps in the coordination of emergency response if needed.

Hope to see you at your next semi-annual lab inspection!

UNE Green Chemistry Commitment

By Peter Nagle and featuring Amy Keirstead, Interim Associate Dean, CAS/Assistant Professor, Chemistry

On February 15th, I had the pleasure of attending the kickoff of UNE's Green Chemistry Commitment. The ceremony was highlighted by the signing of the commitment by Dean Jeanne Hey and John Stubbs, Chair of the Department of Chemistry and Physics, a demonstration of a green chemistry innovation by the UNE student Chemistry Club, and a short talk by Derrick Ward, the Program Manager for Higher Education at Beyond Benign, the Green Chemistry non-profit organization that administers the Green Chemistry Commitment. Afterwards, I sat down with Amy Keirstead to get her thoughts on the Green Chemistry Commitment and how it will impact the UNE community.



Green chemistry display at lower level of Morgane Hall.

What is Green Chemistry?

While chemistry has been responsible for tremendous innovation and improvements in our lifestyle, there's no disputing that many chemical processes have also resulted in damage to our environment. The goal of Green Chemistry is to yield the same products and innovations afforded by more traditional chemical methods, while using less hazardous materials and more energy-efficient processes, and creating less waste. An additional advantage of Green Chemistry over traditional methods is that the entire lifecycle of the product is considered, including efforts to use renewable feedstocks and designing the product for recyclability or biodegradation.

CAS Dean, Jeanne Hey and Dept. of Chemistry and Physics Chair, John Stubbs, signing the green chemistry commitment.

What is the Green Chemistry Commitment?

It is a program for higher education institutions to commit to a set of learning outcomes by concentrating on a green chemistry approach to solving problems in the 21st century. It is supported by Beyond Benign, a non-profit organization focusing on green chemistry in the classroom that encourages educators and students to practice sustainability through chemistry. UNE is the first college or university in Maine and northern New England to sign the commitment.

What are the benefits of the Green Chemistry Commitment to UNE, the students and faculty?

The commitment will consolidate our green chemistry efforts. Right now, though we are invested in green chemistry, our efforts are piecemeal. By signing the commitment we can coordinate these efforts and take advantage of the benefits of being connected to a community of like-minded institutions. For our students, since green chemistry has been slow to make its way into the classroom universally, having a background in green chemistry will make them more competitive in the job market when they graduate. Also, having a curriculum that includes green chemistry will make UNE more attractive to incoming students interested in an environmentally friendly and sustainable chemistry program.

How do you plan to implement the Green Chemistry Commitment and integrate it into the curriculum?

We are in the infancy stage of the commitment right now. Brainstorming, documenting, and assessing what is working and then submitting a report to an advisory board at the end of the semester is our first step. Afterwards we will begin a more thorough integration of Green Chemistry into our curriculum based on the recommendations from the advisory board.

You said earlier that we are already invested in green chemistry prior to signing the commitment. Can you give some examples?
The UNE student Chemistry Club has been involved with green chemistry in a partnership with Beyond Benign through their training as Green Chemistry Outreach Fellows. Several of our faculty members have integrated Green Chemistry theories and experiments into their laboratories, including student research projects, and there are applications of Green Chemistry and toxicology included in the research areas of both myself and some of my colleagues. However, all of these efforts are independent and not a coordinated approach – we are optimistic that adopting the Commitment will bring these efforts together in a more cohesive way. Beyond that, taking advantage of the many resources afforded to us by being signers of the Commitment and incorporating these into the curriculum and extra-curricular work will allow our students a more enriched experience.

Do you have any examples of green chemistry initiatives that are now a success in the marketplace?
Ecovative, the bio-degradable packaging material on display at the ceremony is made from combining agriculture waste with mycelium cells (vegetative part of the fungus) from mushrooms. The agriculture waste is first cleaned then introduced to the mycelium cells which grow through and around the loose agriculture particles binding the two together. The product is seen as a sustainable substitute and replacement for Styrofoam as it can be composted at home after it has been used for its original purpose. The home goods company, IKEA, started using the product as packaging material. Another example is the Adidas "Parley" shoe, which uses plastic from fishing nets recovered from the ocean. That technology was developed at the Warner Babcock Institute in Massachusetts, the partner institution to Beyond Benign.

The Green Chemistry Commitment is a worthwhile endeavor for the Department of Chemistry and Physics to undertake. Since we are the first university in northern New England to sign the agreement, it will give the department an opportunity to be a regional leader in green chemistry initiatives. For our students, the hands on experience with green chemistry will be invaluable to them when they either go on to grad school or enter the workforce after graduation. The EHS Department wishes Amy and the Chemistry Department great success in this objective and is willing to help in any capacity we can.

If you would like more information on the Green Chemistry Commitment, Beyond Benign, Ecovative, or the Adidas Parley Shoe here are some websites you can visit:

http://www.beyondbenign.org/

https://www.ecovativedesign.com/

http://www.adidas.com/us/parley

CAS Dean, Jeanne Hey and Chemistry and Physics Department Chair, John Stubbs displaying the Green Chemistry Commitment.

Derrick Ward, Program Manager for Higher Education at Beyond Benign

Chemistry Club members demonstrate Ecovative green packing materials.

Authorization to Use Radioactive Materials

By Ronnie Souza, RSO

If You Are a Principal Investigator

You must apply to become an Authorized User for the use of radioactive materials in your laboratory at University of New England (UNE). Applications are reviewed by the UNE Radiation Safety Officer (RSO) then submitted for final approval from the Maine Department of Health & Human Services, Radiation Control Program. The entire authorization review and approval process typically takes 3-4 weeks. **Contact the RSO, rsouza@une.edu or cell: 207.391.3491, to discuss your authorization plans and to get started with the application process.** If you need to use radioactive materials in very small quantities (usually referred to as Exempt Quantities), the authorization process may be simpler and quicker.

If You Are an Undergraduate or Graduate Student, Post-Doctoral Student, or Other Staff

The Principal Investigator (PI) in charge of a laboratory is the Authorized User, i.e., the person who holds the official radioisotope authorization for the lab. Students and staff working in the PI's lab will use radioactive materials under the PI's authorization. If your PI is not currently authorized to use radioactive materials, your PI must either become authorized or you must find a PI who is authorized to do the type of radioisotope work you want to do and who is willing to allow you to work under his/her authorization.

Be aware that you will not be allowed to work with radioactive materials until you complete Radioactive Materials Safety training.

If You Are Not Authorized to Use Radioactive Materials and Have a Short-Term Need to Perform Radioisotope Experiments

If you need to perform a very limited set of radioisotope experiments and have no plans for longer-term radioactive material use, it may be possible for you or your staff to work under the authorization of another PI. Discuss your needs with the RSO.

Amending Your Authorizations

You (the PI) must apply for an amendment to your authorizations for any of the following circumstances:

- To add or delete an authorized location for radioisotope use
- To increase or decrease the authorized possession limit
- To amend the authorized chemical or physical form
- To amend the authorized experimental protocol or to add a new experimental protocol
- To amend the experimental protocol to allow the *in vivo* or *in vitro* use of radioactivity in animals

Contact the RSO to discuss the amendment process: Ronnie Souza (rsouza@une.edu, X-2488)

OSHA® FactSheet

Laboratory Safety Noise

This guidance is advisory in nature and informational in content. It is not a standard or a regulation, and it neither creates new legal obligations nor alters existing obligations created by OSHA standards (i.e., the Occupational Noise Exposure standard: 29 CFR 1910.95) or the Occupational Safety and Health Act. In preparing this guidance, OSHA reviewed existing practices and programs as well as available scientific information on noise in laboratories, and reflects comments received from representatives of selected professional associations and laboratories.

Millions of workers are exposed to dangerous levels of noise in their workplaces. Over the past 20 years, government agencies have consistently identified noise-induced hearing loss as one of the top concerns of workers. Noise in laboratories is a growing concern.

Because of concern about noise in clinical laboratories, accrediting agencies are implementing special emphasis programs on noise reduction in these workplaces. As a result of this concern, the College of American Pathologists added laboratory noise evaluation to their General Checklist for Accreditation.

Noise Levels Can Cause Hearing Loss

The Occupational Safety and Health Administration's (OSHA's) Noise standard (29 CFR 1910.95) requires employers to have a hearing conservation program in place if workers are exposed to a time-weighted average (TWA) noise level of 85 decibels (dBA) or higher over an 8-hour work shift.

OSHA's permissible exposure limit (PEL) for noise exposure is 90 dBA for an 8-hour TWA and the standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed is cut in half. For example, a person who is exposed to noise levels of 95 dBA (5 dBA above the OSHA PEL of 90 dBA) can be exposed for only 4 hours in order to be within the daily OSHA PEL.[1]

Laboratory Equipment Produces Noise

While the noise levels in most laboratories are below the threshold level that damages hearing, laboratory noise can be fairly loud. The operation of large analyzers (e.g., chemistry analyzer), fume hoods, biosafety cabinets, incubators, cell washers, tissue homogenizers, and stirrer motors, all contribute to the noise level. Other sources of noise in laboratories include fans and compressors for cryostats, refrigerators, refrigerated centrifuges, and freezers. As an example, a high speed refrigerated centrifuge alone can generate noise levels as high as 65 dBA. To provide some further context, a whisper registers approximately 30 dBA; normal conversation about 50 to 60 dBA; a ringing phone 80 dBA; and a power mower 90 dBA. If noise levels exceed 80 dBA, people must speak very loudly to be heard, while at noise levels of 85 dBA, people have to shout to communicate with coworkers who are an arms length away.

Measuring Noise Levels

Using a sound level meter, employers should monitor the noise levels generated by various pieces of lab equipment to identify equipment that has excessive noise levels. Most manufacturers have set limits on noise-producing equipment (i.e., less than 85 dBA). When equipment exceeds these limits (i.e., > 85 dBA), personal noise measurement, engineering controls, posting of warning signs, and hearing protection options should be evaluated and implemented. The key is to identify lab equipment that is producing excess noise in the work area and implement controls to keep personal full shift noise levels below the OSHA Permissible Exposure Limits (PELs). Refer to Table G-16, Permissible Noise Exposures, in the Noise standard (29 CFR 1910.95), as a means for determining noise limits for the laboratory environment.

Negative Effects of Noise at Typical Levels in Laboratories

The recommended upper limit for noise for speech to be intelligible is 55 dBA. If the noise level in the laboratory is too high for the staff to hear what is being said, whether in conversation or on the telephone, there is a danger of misunderstanding instructions or laboratory results. Employers should evaluate improvements in design, engineering controls, and instrumentation that will reduce the noise generated.

Other Negative Effects of Noise on Laboratory Workers

Exposure to high levels of noise can lead to:

- Hearing loss;
- Tinnitus (ringing in the ear);
- Stress;
- Anxiety;
- High blood pressure;
- Gastrointestinal problems; and
- Chronic fatigue.

Reducing Noise in a Laboratory

There are several steps that can be taken to minimize noise in the laboratory:

- Moving noise-producing equipment (e.g., freezers, refrigerators, incubators and centrifuges) from the laboratory to an equipment room;
- Placing compressors for controlled-temperature rooms in a remote location; and
- Providing acoustical treatment on ceilings and walls.

[1] **Note:** It should be noted that other organizations have recommended exposure limits and exchange rates lower than those specified by OSHA. For example, the National Institute for Occupational Safety and Health (NIOSH) has an 8-hour TWA recommended exposure limit (referred to as a REL) of 85 dBA. In addition, NIOSH recommends an exchange rate of 3 dBA rather than 5 dBA. This means that if the noise exposure goes from 90 dBA to 93 dBA, the worker can only be exposed for 4 rather than 8 hours to be within the daily REL. (See: http://www.cdc.gov/niosh/docs/2009-136/pdfs/2009-136.pdf).

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; the teletypewriter (TTY) number is (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration
www.osha.gov 1-800-321-6742

OSHA FS-3463 8/2011
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If you feel anyone in your lab area needs to join the UNE Hearing Conservation Program due to workplace noise exposure please notify EHS as soon as possible.
The hearing test van will be on campus in April!

UNE Chemical Sharing Program

The UNE Chemical Sharing Program is a great way to reduce hazardous waste, reduce costs for your department, and have a positive environmental impact on campus. If you have any commonly used lab chemicals that you are thinking of disposing, please contact EHS so they can be listed in the next issues of EHS Lab Chatter as available for the UNE Chemical Sharing Program.

No chemicals currently available.

To contribute a topic or article to EHS Lab Chatter,

email: jtyre@une.edu

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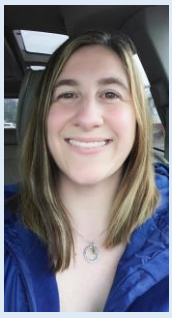

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