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E N V I R O N M E N T A L H E A L T H a n d S A F E T Y

Laboratory Safety Incidents and Their Impact

On December 29, 2008, Sheri Sangji, a UCLA lab assistant, was working with t-butyllithium, a chemical compound that spontaneously ignites when exposed to air. While using a syringe to extract a small quantity from a sealed container, the plunger came out of the syringe and the chemical was exposed to air causing a flash fire. Ms. Sangji was injured and died as a result of her injuries several days later. In December, 2011, the principal investigator, Dr. Patrick Harran, and the University of California Board of Regents, were criminally charged for allegedly willfully violating health and safety standards in relation to Ms. Sangji's death. In this situation, the California Department of Industrial Relations found that the Harran lab had a lack of adequate lab safety training and documentation, lack of effective hazard communication practices, and repeated failure to correct persistent safety violations within labs.

On January 2, 2010 a Texas Tech graduate student lost three fingers, was severely burned, and suffered eye damage after a high energy metal compound he was working with detonated. As a result of this explosion, the Chemical Safety Board (CSB) held an investigation. The CSB is an independent federal agency charged with investigating industrial accidents. The CSB's investigation at Texas Tech was unique in that

the investigation was focused on a university accident. The investigation stemmed from an increase in media attention to laboratory accidents across the United States which

included the June 2009 hydrogen explosion in a biochemistry laboratory at Schweitzer Hall at MU. The CSB has issued a report which included a recommendation that the American Chemical Society (ACS) develop methods for evaluating and controlling chemical hazards in academic laboratories.

What does all this mean for our campus community? These accidents should encourage everyone to be safety conscious in the work they do, especially in a laboratory setting. In fiscal year 2011, MU scientists and scholars generated \$425.6 million in research and academic enterprises. A lot of work is being performed in labs where chemicals are used and stored. Although not everyone on campus works in a lab, many work in, or take classes in, buildings where chemical laboratories are found. Environmental Health and Safety is working to raise awareness of the need to work safely in laboratories. It is important to have a strong safety culture with an

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emphasis on laboratory safety. We are currently investigating tools that will make it easier for researchers to define and communicate safety hazards. We are following the lab accidents that occur at other institutions, monitoring laboratories for safety concerns, and taking part in the ACS discussion on chemical hazards in academic laboratories.

What can you do to improve the safety in your area? If you see a safety concern, contact the supervisor or manager of that area and bring it to their attention right away. Most problems are easily corrected once they are brought to the attention of the responsible party. Make sure you conduct yourself in a safe manner and follow all necessary safety practices as you work. Set an example of safety for your lab and encourage others to do the same.

As a result of the Texas Tech investigation, CSB Chairman Rafael Moure-Eraso said, "Research conducted at university laboratories is often on the forefront of technology and innovation. It is important that this research continues and thrives. But it must be done within a strong safety culture based upon effective safety management systems where preventing hazards is an important value."

For more information on the lab accidents detailed above, please watch the informative video, *Experimenting with Danger*, produced by the CSB.

http://www.csb.gov/videoroom/detail.aspx?vid=61&F=0&CID=1&pg=1&F_All=y

Links to several chemical safety principles can be found on the EHS website.

<http://ehs.missouri.edu/chem/chemicalsafety.html>

Update

As of the week of July 29, 2012, prosecutors have dropped felony charges against the University of California's Board of Regents. However, at this time charges have not been dropped against Dr. Harran. In exchange for dropping the charges against the University of California system, the University has accepted responsibility for safety conditions that attributed to Ms. Sangji's death, has agreed to establish an environmental law scholarship at UC Berkley in Ms. Sangji's name and maintain a laboratory safety program across all campuses for chemistry and biochemistry.

Things EHS Wants You to Know About Laboratory Safety

Laboratory Safety plays an important role at MU. As Environmental Health and Safety works to promote lab safety on campus, we often emphasize basic safety principles that apply to a wide range of research and work areas and. We recently circulated a question within our department, "If you could have the people on campus that you work with do just three things regarding laboratory safety, what would those things be and why?" The different technical units within EHS had several different answers as they applied to their field, with one exception. Everyone stressed the importance of wearing proper personal protective equipment (PPE) at all times. As you read this article, ask yourself how many of these apply to your workplace and are you serving as a role model for others in your area?

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Things EHS Wants You to Know About Laboratory Safety Cont.

Wear appropriate PPE at all times, especially safety glasses or protective eyewear, lab coats, and gloves. There are two factors that are important to PPE. First, it has to be available and worn by the individual, and second, it has to be appropriate for the type of work being performed or the materials being handled. Not all gloves are appropriate for every situation. The same can be said for protective eyewear, foot protection, and respiratory protection. For more information on selecting the appropriate PPE for your work, go to <http://ehs.missouri.edu/ppe/>

Attend and maintain relevant EHS provided training and make sure everyone in your work area does the same. EHS holds regular classes on Biosafety, Chemical Management and Radiation Safety. Not only are these classes required for anyone working with biohazardous materials, hazardous chemicals or radiological materials, respectively, but they discuss safety and regulatory practices that need to be followed on campus. Renewal training is available for these courses. Initial classes are held in person to allow individuals to ask questions. Other online classes include Bloodborne pathogens training, shipping regulated materials, rDNA, general safety and emergency preparedness. <http://ehs.missouri.edu/train/index.html>

Principal Investigators should take a more enhanced role regarding lab specific training and impress upon their personnel the importance of laboratory safety. Safety is everyone's responsibility and it is important that everyone working in a lab or other work area has knowledge of the safety procedures they need to take regarding the research being performed. That standard has to come from the top down. If

a principal investigator does not fully understand the safety issues with his or her research, it is improbable that other lab personnel will either. It is also important to supplement EHS training with documented, in-house, lab-specific training.

Once a year lab personnel review emergency procedures for their laboratory. This should address injuries and spills as well as other possible risks such as severe weather. The time to learn how to respond to an emergency is before the emergency has taken place, not after. One time to open such a discussion would be after building Fire Drills, or Severe Weather Drill held in the Spring. Consider devoting at least five minutes of each staff meeting to discuss safety or emergency preparedness. An online class titled University of Missouri Emergency Guidance for Faculty and Staff is available at <http://ehs.missouri.edu/train/emergency-guidance/genemer-opening.html>

Laboratory safety equipment should be checked on a regular basis to make sure it is in proper working order or is fully stocked. We have all gone to the first aid kit and found that the size bandage we need is missing. It is important that the same thing not happen with your spill kit equipment or safety gear. If you use something, make sure it is restocked. Don't expect someone else to do it. Once a month, check all safety equipment in your area to make sure it is in proper working order. If you find a problem, inform your supervisor or the appropriate personnel in your department. Make sure you know the location of the closest fire extinguisher, eye wash, safety shower and emergency exit from your work area. Finally, be diligent about not blocking access to these potentially life-saving features.

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Things EHS Wants You to Know About Laboratory Safety Cont.

When working with radioactive materials, always remember “Time, Distance, and Shielding”. In order to minimize your exposure to radioactivity you should minimize the amount of time you are exposed to radioactive material, maximize your distance away from radioactive material, and maximize shielding around the radioactive material you are using. It is also important to use the proper type of shielding for the type of material you are working with.

When working with radioactive materials, survey often, especially your hands and feet before you leave an area after working with radioactive materials. You cannot see radiation. Therefore, a simple visual inspection is not adequate to know if you have been contaminated by radioactive material. It is important to perform frequent surveys of your work area to make sure there is no unexpected contamination. It is also important to survey yourself, especially your hands and feet, after working with radioactive material to make sure you are not contaminated or in danger of spreading the contamination to other areas.

Upcoming Safety Events

FIRE FACTOR September 19, 11:30am - 3:00pm, Lowry Mall

Every year EHS partners with Residential Life and Student Life to present FIRE FACTOR. This event emphasizes the importance of fire safety and understanding how quickly fires can spread. The event includes an obstacle course where participants have to wear the same gear

firefighters wear and learning how to use a fire extinguisher. The highlight of the event is the burning of a typical student room.

FALL FIRE DRILLS

It is important for everyone to learn about fire safety and prevention, especially in locations where you spend a lot of time, such as your work or where you take classes. If your MU group, department, or building would like to plan and participate in the yearly October University fire drills, please contact EHS.
<http://ehs.missouri.edu/fire/drills.html>

SPRING SEVERE WEATHER DRILL

Every spring, Missouri holds a severe weather drill to test its emergency notification system. This is a perfect opportunity for your department and/or building to practice what you would do in the event of a real weather emergency. Please contact EHS if you need help organizing a drill for your area.
<http://ehs.missouri.edu/fire/drills.html>

GREAT AMERICAN SHAKEOUT February 7, 2013, 10:15am

Columbia is several hundred miles from the closest *known* areas of seismic activity. However, as was experienced on August 23, 2011 on the East Coast, earthquakes can have far reaching effects. The Great American ShakeOut is an opportunity for you to practice protecting yourself, your families, and your coworkers in the event of an earthquake. For more information on earthquake safety and planning a drill, please view the ShakeOut website at <http://www.shakeout.org/centralus/>

For more information on these and other campus safety related items, please check out the EHS website at <http://ehs.missouri.edu>

Treating Heat Related Emergencies

During hot summer months there is a greater chance of someone suffering from a heat related emergency. The best course of action is to be proactive and prevent a heat related emergency before it starts. (For information on Avoiding Heat Related Illness please see the Spring 2012 Safety Notes, <http://ehs.missouri.edu/about/pdf/Spring12.pdf>.) However, it is also important to know what steps to take in the event that someone becomes overheated.

There are three levels of heat related emergencies: Heat Cramps, Heat Exhaustion, and Heat Stroke. Because heat related emergencies build on themselves, it is important to treat them as soon as you recognize the symptoms of any one of these.

Heat Cramps

Heat Cramps are the least severe heat related emergency. Cramping usually occurs in the legs and abdomen due to the body losing electrolytes. The individual may also have a headache. If this occurs, get the victim out of the heat. If they are fully conscious, give them cool liquids to drink, such as a sports drink or water. Avoid caffeinated drinks as they interfere with the body's ability to regulate temperature. Have the victim lightly stretch and massage the area.

Heat Exhaustion

Heat Exhaustion occurs when the body's natural system starts to break down. Signs of Heat Exhaustion include sweating, nausea, dizziness, vomiting, muscle cramps, feeling faint, and fatigue. If this occurs, get the victim to a cool location, remove as much of the victim's clothing

as possible and spray them down with cool water or place damp cloths on areas where blood vessels run close to the skin. These include the neck, arm pits, groin, and inside the knees and elbows. It is important to treat Heat Exhaustion quickly because it can move into Heat Stroke.

Heat Stroke

Heat Stroke is a life threatening condition and occurs when the body is no longer able to cool itself. The signals of Heat Stroke include anything related to Heat Exhaustion but also includes confusion, passing out, dizziness, and seizures. If this occurs, activate the Emergency Response System by calling 9-1-1 and get the victim into cool water up to their neck if possible, or spray them with a cool water spray.

Stop cooling a person once their behavior returns to normal. Do Not use ice cold water as this will be too much of a shock to a victim's system. Continued cooling could also cause a person's body temperature to drop too much and cause them to go into hypothermia. If the person is conscious and can drink, give them something cool to drink, such as a sports drink. If the person fails to regain consciousness or cannot drink, wait for medical help to arrive and take over care of the victim.

To learn more about treatment of heat related and other illnesses, please contact the local American Heart Association or the American Red Cross and attend a first aid course.



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CPR and First Aid Courses Offered at EHS

Environmental Health and Safety has been offering First Aid and CPR courses for several years. There have been some recent changes that we would like to announce. As of September 2011, EHS switched from teaching American Red Cross courses to American Heart Association courses. Through the new program infant and child CPR will always be offered with every CPR course. Also, we will be able to offer BLS (Basic Life Safety) courses to those in the health professions needing this level of training.

Starting July 1, 2012, EHS will charge for CPR classes. The Heartsaver First Aid, CPR, and AED (Automated External Defibrillator) course will cost \$50.00/person and will include a parking pass for the day, if needed, at the lot outside our building.

For those who have already attended the full course, and just need to maintain certification, the refresher course will cost \$25.00/person. This also includes a parking pass, if needed. To take a refresher course the attendee must show proof that they have been certified for CPR within the past two years. There will be no additional charge for the BLS course component.

At this time EHS CANNOT accept debit or credit cards, or student charges. Individuals must pay for the course in advance with cash or a check. Payment for a class must be received at least two days in advance or the participant will lose their place in the course.

If you have any questions on the CPR or First Aid course offering at EHS, please feel free to contact Rebecca Bergfield at bergfieldr@missouri.edu or 882-3986.

EHS appreciates campus support of environmental and safety issues. If you have any special needs regarding the format of this publication, or have any comments regarding newsletters, training programs or services, please direct your communications to Rebecca Bergfield, Editor at the above address.