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Environmental Health & Safety

SafetyMatters

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Environmental Health & Safety

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Paperless Radiation and Dosimetry Reporting System

by Angela Meng, Deputy Radiation Safety Officer

Effective April 2018, Landauer, the company that provides Columbia University's dosimeters and reports, has transitioned to a paperless reporting system. Landauer is making all dosimetry reports available online at www.myLDR.com. These reports will continue to be reviewed by Radiation Safety.

Each Principal Investigator, laboratory manager and/or designated dosimetry coordinator whose laboratory uses dosimeters will receive login information for the Landauer website to access their group's dosimetry records. Laboratories and coordinators will receive a reminder email about the availability of the reports each quarter; EH&S encourage users to review the data on this website upon the receipt of the reports and make it available to all affected personnel.

Any individual who has been issued a dosimeter can login to the Landauer website and view their dose history following these steps:

Go to www.myLDR.com and log in with

Username: idrcolu
Password: CUdoseIDR247

Look on the back of your badge for the account number and serial number:

Enter your account number and dosimeter serial number. Click submit.

For any questions or concerns, please email badges@columbia.edu or call 212-305-5359.

When working in the laboratory, eating, drinking or applying cosmetics is prohibited.

Proper work attire (long pants, closed toe shoes) and PPE (e.g., laboratory coat, gloves and eye protection) must be worn when working in the laboratory.

Remember to periodically flush your laboratory cup sinks and floor drains with water to prevent sewer gases from migrating into your laboratory.

For Lab Fire Safety Prevention tips, check out FDN(wh)Y Me

https://research.columbia.edu/content/fdnwhy-me

Spring Into Your LATCH Update!

by George Hercules, Safety Advisor

Take a moment and ask: Does your laboratory have a Chemical Hygiene Plan? This plan is mandated by the *Occupational Safety and Health Administration's (OSHA)* Occupational Exposure to Hazardous Chemicals in Laboratories Standard (commonly referred to as "the Lab Standard", 29 CFR 1910.1450) and Columbia University policy. All plans should be checked annually to ensure information is relevant, and to add or remove hazards from the plan.

How is this accomplished at Columbia? EH&S is here to help all laboratories remain in compliance by hosting the Laboratory Assessment Tool and Chemical Hygiene Plan (LATCH). The LATCH is not only for chemical hazards, it also evaluates a laboratory's biological, radiological, laser and physical hazards, as well as other specialty conditions that may be present in the laboratory. Keeping the LATCH up-to-date to account for all potential hazards in the laboratory addresses the important safety and compliance requirements found in the Lab Standard. Creating a new plan or updating an existing one can be completed by an easy online process.

The LATCH can be accessed via EH&S' online laboratory safety information database, LION, at www.ehs.columbia.edu/lion. Ensure that single sign-on is selected so your login can be authenticated by Columbia.

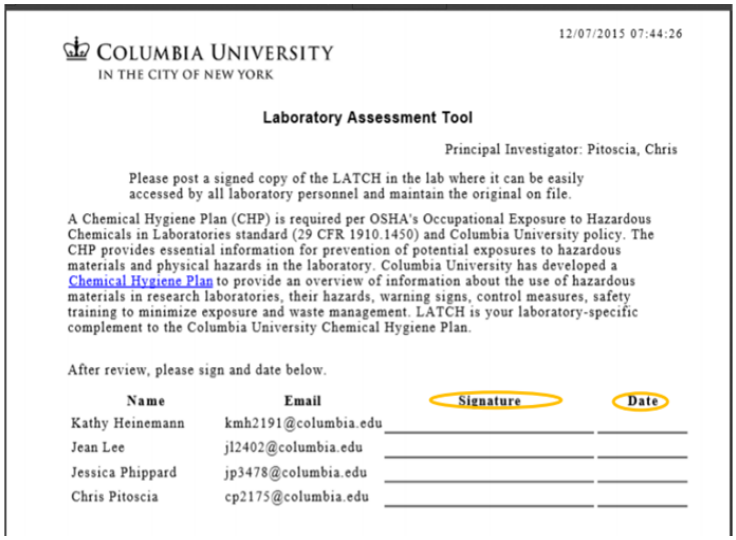
The LATCH icon is located to the left on the LION website. After clicking through, the assessor (the PI or the Lab Manager) selects the "New Assessment" tab to create a new LATCH or update an existing LATCH (the system will provide a copy of the previous LATCH as a template to update, if applicable).

When creating or updating the LATCH, select the Principal Investigator under "Scope" and click "Begin Assessment." Complete the activity assessment for each hazard class under the "Category" menu by checking each applicable laboratory activity and saving as each one is completed. Once finalized, compile the laboratory's safety and emergency equipment inventory. A note about Personal Protective Equipment (PPE) under activity assessment: Each activity automatically provides the required PPE. If there is any deviation, there is a text box to provide an explanation so EH&S can evaluate the modifications.

Additionally, under the "Attachments" tab, a chemical inventory or a PDF document containing the SDS sheets for all chemicals used within the laboratory can be uploaded, along with an excel spreadsheet of the laboratory's chemical inventory or other related safety and compliance documents.

Complete the LATCH assessment so EH&S can review for additional information or clarifications that may be needed, and return the LATCH to the laboratory for signature. After the LATCH is finalized, remember to have everyone in the laboratory sign the document (Pictured). This can be done by hand signature after printing or may be done by using the new digital signature option now available inside the document. No matter how it is signed, have the LATCH printed out and placed in a highly visible place in the laboratory.

If there are any questions or to request assistance with a LATCH assessment please email your Safety Advisor: labsafety@columbia.edu.



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COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

Laboratory Assessment Tool

Principal Investigator: Pitoscia, Chris

Please post a signed copy of the LATCH in the lab where it can be easily accessed by all laboratory personnel and maintain the original on file.

A Chemical Hygiene Plan (CHP) is required per OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories standard (29 CFR 1910.1450) and Columbia University policy. The CHP provides essential information for prevention of potential exposures to hazardous materials and physical hazards in the laboratory. Columbia University has developed a Chemical Hygiene Plan to provide an overview of information about the use of hazardous materials in research laboratories, their hazards, warning signs, control measures, safety training to minimize exposure and waste management. LATCH is your laboratory-specific complement to the Columbia University Chemical Hygiene Plan.

After review, please sign and date below.

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Disinfection Connection

By Cody Cameron, Biosafety Officer

Have you ever made plans with 70% ethanol and noticed it never seems to stick around? When you are out on the town and run into an unruly adenovirus, does your disinfectant conveniently disappear? Or when you try to make plans with isopropanol, it just does not have the (contact) time to spare? No need to remain frustrated, the Environmental Protection Agency (EPA) will find the right disinfectant for you.

Bleach and water can be a match made in heaven for disinfection. Even public water systems use chlorination to disinfect drinking water from bacteria and viruses. In regards to treatment of liquid bacterial culture, cell culture media, or any type of liquid regulated medical waste (RMW), bleach is always recommended. It only takes a low concentration of 0.65% bleach (sodium hypochlorite) for proper disinfection. Therefore, this can be scaled to a 10% bleach solution proportionally to the respective volume of liquid RMW. As an added benefit, a typical container of 6% bleach is cost effective for long-term bulk disinfection.

Aside from the concentration of the disinfectant, the contact time between a disinfectant and microbe must also be considered. This quality time is also known as "kill time" (hey, love hurts!), and it is defined as the required duration that a disinfectant needs to remain wet on a surface for it to be effective against microorganisms. For instance, a 10% bleach solution has a contact time of 1 minute for *Staphylococcus aureus*, Adenovirus, and Herpes Simplex Virus. Contact time is essential for the proper use of the product. Ensuring that the surface remains wet for the effective duration of time exposes the microorganism to the disinfectant long enough for it to be killed.

Not every disinfectant fits every situation. In some instances, the amount of biological material (aka bioburden) can overwhelm a disinfectant such as ethanol. 70% ethanol is a solvent that can disrupt the lipid based structure of enveloped viruses such as HIV and Herpes Simplex Virus along with a broad range of bacteria including *E. coli* and *Streptococcus pneumoniae*. Bear in mind, however, that ethanol is ineffective against non-enveloped viruses such as Adenovirus and Adeno-associated Virus.

Similar to bleach, concentration is also important to consider when working with alcohols as disinfectants. Ethanol and isopropanol's bactericidal activity exists in the ideal range of 60-90%, while efficacy drops drastically when diluted below 50%. In contrast, concentrations above 90% will not achieve the necessary contact time due to evaporation rates at room temperature. If contamination is visible (e.g., a blood smear), ethanol is likely insufficient and an alternative disinfectant should be considered. For larger spills, bleach is exceptional at killing fungi, spores, viruses, and bacteria and does not evaporate as readily as alcohol.

The surface that is being treated also needs to be considered as bleach is corrosive to stainless steel, like in the interior of biosafety cabinets. Bleach is also corrosive to skin, mucous membranes, and is a harsh respiratory irritant. So as an alternative to bleach, quaternary ammonium compounds ("quats") such as Quatricide, Quat-plus, or chlorine dioxide based products like MB-10 or CLIDOX-S may be more suitable than bleach for surface decontamination as they are not as noxious or corrosive. To evaluate a suitable disinfectant with respect to the type of contamination, it is strongly recommended to refer to the EPA product claims guide.

In order to receive an EPA registration, disinfectants are tested by the manufacturer for effectiveness in killing different types of microorganisms. This information is provided as a series of product "claims". The EPA claims are often posted on the product website and may be included in the product directions. When choosing a disinfectant for a particular application - e.g., disinfecting enveloped versus non-enveloped viruses - the product claims should be reviewed because information can be extrapolated between infectious agents. For example, if the product claims to be effective against Norovirus, it can be used at the same concentration and contact time to kill Adenovirus since these are both non-enveloped viruses. As well as having a prescribed contact time, quats and chlorine dioxide disinfectants are typically diluted to a particular concentration based on the target organism, and these products also come with an expiration date. EH&S maintains a library of claims documents which can be provided by emailing biosafety@columbia.edu. In conclusion, always remember to read the product directions, make sure the disinfectant and microbes spend enough "quality time" together, and never miss an expiration date.

Situational Awareness in the Laboratory

by Jon Paul Aponte, Fire Safety Officer

First responders are constantly practicing situational awareness. They are warned and trained not to have "tunnel vision", where focus on one specific area or task can lead to ignoring other immediate hazards. At Columbia, EH&S' Fire Safety Officers drill situational awareness during fire safety training, as well as during new user orientation, such as in the newly commissioned Columbia Nano Initiative Clean Room on the Morningside campus. In the example of the Clean Room, there are special hazards in that space and although there are many redundancies and safety protocols in place, every user must be prepared in the event of an emergency.

Recently, during an inspection with the FDNY Bureau of Fire Prevention, there was an issue that likely went unnoticed by laboratory personnel. Outside of the laboratory door there was an overhead safety shower and directly underneath was a tall, heavy table. Imagine this: a researcher spills a hazardous chemical and splashes themselves. They run to the use the safety shower but find that it is blocked. In this panicked moment they would be forced to move this tall, heavy table in order to use the shower and delay washing off the chemical. While the chemical spill is hypothetical, the table-under-the-shower scenario is real and a perfect example of a lack of situational awareness. Should a researcher need the emergency shower, they would be blocked from doing so – and in an emergency every second counts.

EH&S' Fire Safety Officers shine a light on unintentional tunnel vision in the laboratory, with recommendations that are simple to implement. How can Columbia University research staff be more situationally aware? Always know where emergency safety equipment is located, including fire extinguishers and overhead emergency showers. Spill kits should be accounted for and maintained. Know the laboratory and building exits and keep paths of egress clear. If there are any discrepancies or issues, fix them immediately or contact EH&S to help remedy. Practice and drill these steps so utilizing safety equipment in an emergency situation will be straightforward.

If you have any questions concerning this topic or want to ensure your laboratory meets all recommendations, contact fire-life@columbia.edu.

Summer is Here! Keep Cool With Proper Laboratory Attire

Yes
Long pants
Closed toe shoes
+
Lab Coat

No
Shorts
Sandals/Flip

https://research.columbia.edu/sites/default/files/content/EHS/Policies/PPEPolicy.pdf

Near—Misses: An Early Warning Sign

by Parinita Sah, Safety Advisor

Recently, a researcher felt dizzy and experienced discomfort while working in a cold room on the Columbia campus. EH&S was contacted, and learned that dry ice was packed in the cold room in an attempt to keep the temperature low during a planned shut-down, which created a very dangerous situation. Dry ice sublimes over time and releases carbon dioxide gas which in turn can displace oxygen in a non-ventilated environment. A person situated in such a deoxygenated space will experience hypoxia, inadequate oxygenation of the blood and tissues.

At another university, the University of Waterloo, two researchers found Piranha solution in a sealed glass container next to a glass bottle of acetone on the floor. Piranha is a mixture of sulfuric acid (a corrosive) and hydrogen peroxide (a strong oxidizer) that also off-gases. Although an accident was prevented by separating the containers, there were two reasons the researchers were concerned. Piranha reacts violently with organic compounds, and if there were to be an inadvertent mixing of Piranha with an organic solvent like acetone - such as if the bottles had leaked or broken - shock-sensitive organic peroxide could potentially be produced that may be explosive. The Piranha solution container also did not have a vented cap; gas evolution can lead to pressure build-up and bursting if the solution is stored in a closed container.

These episodes are both prime examples of near-misses. A near-miss is defined by the Occupational Safety and Health Administration (OSHA) as "an incident in which no property was damaged and no personal injury was sustained, but where, given a slight shift in time or position, damage or injury easily could have occurred." There might be very little evidence that anything occurred. In the scenarios above, the nature and risk/severity were different but what makes the near-misses similar is the narrow escape or a stroke of luck to not become a full blown injury or incident.

Laboratories have learned the hard way that when near-misses are not recognized or rectified, luck runs out and the near-miss becomes the actual incident. Near-misses do outnumber accidents yet near-miss reporting is not prevalent. Reporting leads to early interventions, opportunities to improve safety, and gaining valuable data on "real-world" vs. hypothetical happenings in research.

EH&S encourages researchers to report not just incidents but those near-misses as well. The data collected helps to identify and analyze the root causes of a near miss and allows EH&S to help provide corrective actions in a timely fashion and prevent negative consequences.

Laboratory personnel are encouraged to:

- Discuss safety concerns during laboratory meetings and bring them to the attention of EH&S. Uncovering a near-miss, plus understanding what could have been the worst case scenario, plays a significant role in contingency management.
- Review standard operating procedures (SOP) and safety policies periodically. Making appropriate modification to the processes based on prior experience can help harness safety enhancements.
- Reinforce basic safety guidelines amongst yourselves and increase accountability and ownership of the safety culture in your laboratory.
- Emphasize mindfulness when working in the laboratory and maintain thorough knowledge of your surroundings e.g., locations of eyewashes, fire extinguishers, and emergency exits.

Identifying near-misses, understanding the root causes of them, and taking corrective actions is a great investment to make your workplace safe. For additional information about the University of Waterloo laboratory near-miss, see the full report at https://uwaterloo.ca/engineering-cases/content/near-miss-lab-incident-case-study-regarding-piranha-etch. To report or discuss near-misses please contact labsafety@olumbia.edu.

Spotlight on Safety — Meet the Hazardous Materials Team

by Vincent Vagnone, Safety Advisor

Environmental Health and Safety's Hazardous Materials Team is responsible for all aspects of hazardous waste management in Columbia University laboratories, including, hazardous and universal waste pickup, battery recycling, electronic waste recycling, and emergency spill response. Recently, EH&S restructured and re-organized the team. Many of the staff have transitioned from their previous roles (Hazardous Materials Specialists, Research Safety Specialists, and Occupational Health and Safety Specialists) to a new Safety Advisor position. The Safety Advisor position encompasses aspects of all of these previous positions and allows for a cross-trained staff with deeper knowledge. This left our two most experienced Hazardous Materials Specialists to manage the program. Keith Bottom (Senior Hazardous Materials Specialist and Lab Sustainability Coordinator) and Franklin Watkins (Hazardous Materials Specialist) now work directly with the University's hazardous waste vendor, Veolia, to oversee Columbia's weekly waste pickup schedule along with managing the overall waste disposal services that they have always provided. Let's check in with Keith and Franklin on how they got here, and the progress of the program:

What is your background and where did you start? And how did you land with Columbia EHS?

Keith: I received a biology degree in college. When I got out of college I wanted to do something to help the environment. I found the hazardous waste industry when I started at Clean Harbors, a company in North Carolina. From there, I transferred to the Northern New Jersey branch which happened to run on-site services here at Columbia. When Columbia had an opening, I applied because I thought I would be a good fit. I've now been here for 8 years.

Franklin:

I went to college at the C.W. Post Campus of Long Island University. I originally worked for Delta airlines at John F. Kennedy airport but after some time, switched careers to work for a hazardous materials company called Safety Kleen. After 13 years with and several roles with Safety Kleen, I worked as a field employee for Columbia's current waste vendor, Veolia. I was exposed to many different institutions around New York City, Including Columbia University. I really enjoyed visiting the Columbia campuses for service. I applied and I was hired here about 5 years ago.

How have you seen the program evolve and how does the Safety Advisor team come into play?

Keith: The program has become more comprehensive. Not only do we provide full on-site service to laboratories, we stay on top of ever-changing regulations and new technologies. In 2015, the Hazardous Materials Team received the Environmental Excellence Award for our Solvent Recycling Program from the NYS Department of Environmental Conservation. Having Safety Advisors support our Hazardous Materials Team helps elevate the program because they will know and recognize the needs of a particular laboratory and be in a position to help develop customized waste management strategies and advance innovations.

Franklin:

I can assure the research community that there is a seamless transition to Veolia performing the pickups. The faces may change but the service remains the same. Now that we have the Safety Advisor team there are some differences in service dates for each location and territory assignments, but everything about EH&S services remains the same.

Where do you see the program going in the future?

Keith: I see that the Hazardous Materials Team having an increasingly collaborative effort within EH&S as well with our Vendors. Our strategic plan includes integration of Waste room inspections and waste room scopes to the Safety Advisors portfolio, as well as streamlining all of our services to the research community such as enhanced scheduling for Veolia onsite services (soon to include RAM pickups)

Franklin:

Sky is the limit. Keith and I are working very hard to take this program to the next level. I believe with help from the Safety Advisor team and our hazardous waste vendors, we can be an impactful part of Columbia for years to come.

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Graphics, Design, Lay-out: Jon Paul Aponte
Please share questions or comments with us at newsfeedback@columbia.edu

Vision Statement

Environmental Health & Safety (EH&S) provides expert guidance and timely service to the University Community through our commitment to health and safety. Employing best practices and collaboration, and by building long term relationships, we promote a productive and safety conscious work environment.