ENVIRONMENTAL HEALTH & SAFETY
UNIVERSITY of WASHINGTON

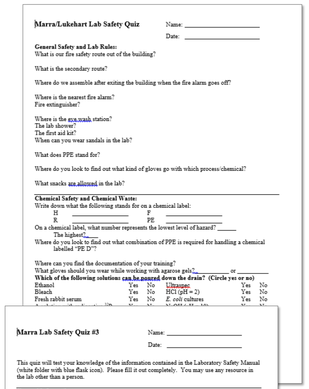
2019 LAB SAFETY AWARDS & INNOVATION EVENT

LAB SAFETY AWARD EH&S

SAFETY QUIZZES AS PART OF LAB MEMBER ORIENTATION AND TRAINING

Lukehart / Marra Labs
Neurology, School of Medicine

Safety quizzes are administered to all employees and students who will be working in the laboratory for any length of time during their first week on the job. People are given a copy of the quiz to fill out during their safety orientation, and new quizzes are administered periodically as needed (particularly when a new version of the Lab Safety Manual or Biosafety Manual is released). After quizzes are completed, a copy is put in the lab's folder and a copy is given to the person for their reference.



Marra/Lukehart Lab Safety Quiz Name: _____ Date: _____

General Safety and Lab Rules:
What is our fire safety route out of the building?

What is the secondary route?

Where do we assemble after exiting the building when the fire alarm goes off?

Where is the nearest fire alarm?
Fire extinguisher?

Where is the eye wash station?
The lab shower?
The first aid kit?
When can you wear sandals in the lab?

What does PPE stand for?

Where do you look to find out what kind of gloves go with which process/chemical?

What snacks are allowed in the lab?

Chemical Safety and Chemical Waste:
Write down what the following stands for on a chemical label:
H _____ F _____
R _____ PE _____
On a chemical label, what number represents the lowest level of hazard? ____
The highest? ____
Where do you look to find out what combination of PPE is required for handling a chemical labelled "PE D"?

Where can you find the documentation of your training?
What gloves should you wear while working with agarose gels? _____ or _____
Which of the following solutions can be poured down the drain? (Circle yes or no)

Ethanol	Yes	No	Ultrapure	Yes	No
Bleach	Yes	No	HCl (pH = 2)	Yes	No
Fresh rabbit serum	Yes	No	*E. coli* cultures	Yes	No

Marra Lab Safety Quiz #3 Name: _____ Date: _____

This quiz will test your knowledge of the information contained in the Laboratory Safety Manual (white folder with blue flask icon). Please fill it out completely. You may use any resource in the lab other than a person.

General Information:
Where is the Laboratory Safety Manual kept?

What section contains information about our lab, such as floor plans and training information?

What section(s) contains information on what chemicals can be discarded in the sewer?

Where are your EH&S safety class certificates kept?

Where is the lab Sewer Log kept?

Use of SOPs:
What does SOP stand for?

Where are SOPs kept?

Look at the SOP for Ethidium Bromide. What PPE should you wear while working with EtBr?

What should you do if you spill a solution of EtBr on the floor?

How should you dispose of EtBr-contaminated gels?

How should you dispose of liquid EtBr waste (such as the TBE solution we use to store gels)?

Practice Safety Questions:
Find a resource that lists what gloves are best for working with various chemicals. What gloves should you use to work with dimethylformamide (DMF)?

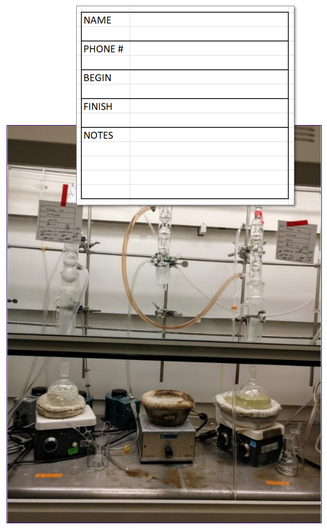
Find a resource that lists how to dispose of various chemicals. Can you dump dimethylsulfoxide (DMSO) down the sink?

Find a resource that lists what PPE corresponds to different letters (A, B, etc). What is listed under "PE" for sodium hydroxide (NaOH, you can find some by the pH meter). What PPE should you wear to adjust the pH of an acidic solution with sodium hydroxide (NaOH)?

NOTIFICATION SYSTEMS FOR EQUIPMENT USE

Ratner Lab
Bioengineering, College of Engineering

Processes done in the fume hood frequently take several days or weeks to complete and there is often a queue waiting to use this shared equipment. A notification system of hood tags are useful for letting everyone know what is going on in the hoods, project timelines, and presence of chemicals that a user would prefer to not share working space with. Lab access requires a safety orientation and new users are oriented to the stocked pads of hood notes as a part of their orientation.



WORK POLICY AND TRAINING PLANS FOR SPECIFIC CHEMICAL USE

Pomfret Lab, Clean Energy Institute
Chemical Engineering, College of Engineering

The Washington Clean Energy Testbeds are an open-access user facility offering instrumentation for fabricating prototypes of clean energy technologies, testing those devices, and integrating them into electrical systems. Some of the research and development processes for electronic devices require the use of particularly hazardous chemicals, including hydrofluoric acid (HF). With over 300 registered users, the Testbeds staff and management have developed a detailed procedure to protect those using HF and other lab users working nearby. The Testbeds HF procedure is based on the EH&S HF SOP, but includes additional requirements that are specific to our lab, such as proper signing procedures, detailed information packets for first responders, location-specific emergency response procedures, time limits and restrictions, and strict "buddy-system" requirements.

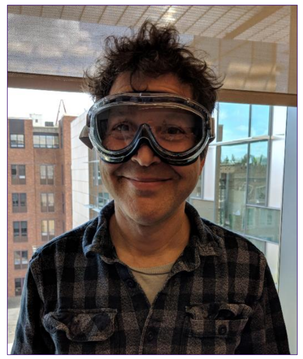
HANDS-ON TRAINING THROUGH THE BUDDY SYSTEM

Pun Lab
Bioengineering,
College of Engineering

An effective method for hands-on training and passing on lab safety knowledge is through using a mentor-mentee pairing system. Senior lab members mentor new members and teach them proper lab safety practices for specific procedures and equipment use, building a culture of accountability from the top down.

HOLDING PPE PRODUCT SHOWS FOR LAB MEMBERS

Baker Lab
Biochemistry, College of Arts & Sciences



One perpetual challenge with PPE use is user comfort. People were avoiding wearing goggles, even when handling strong acids and bases. To combat this, the lab manager held a PPE show where everyone was supplied with lab -appropriate options and allowed to choose what worked best for them. This has led to a significant increase of PPE use as students and researchers can weigh in on what is most comfortable for them and subsequently wear it when needed. Product shows for other PPE items are now being done and lab members know they can make PPE requests.

USING SLOGANS AND UNIQUE SIGNAGE FOR SAFETY COMMUNICATION

Gale Lab
Immunology, School of Medicine

Bringing fun to lab safety by making up catchy phrases that grab people's attention is a successful approach. When UW EH&S handed out purple 6" rulers as a tool for fume hood compliance, I added the phrase "FIX THE SIX" with a description of why it is important to keep items 6 inches from the back of the fume hood. When encouraging labs to stay compliant, it helps to add fun phrases and bright colors to signage so these important reminders don't get washed out into the background.

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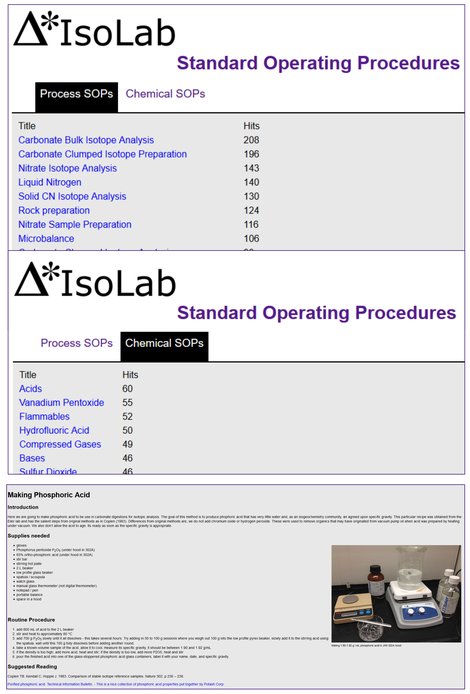
LAB SOP WEBSITE

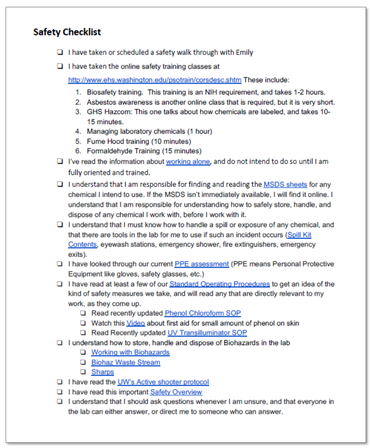
Steig Lab, IsoLab
Earth and Space Sciences, College of the Environment

The lab's chemical hygiene officer, Andrew Schauer, hardcoded a website for the group that includes searchable lists of process and chemical SOPs. By having SOPs available in a device-independent, central, searchable, public, and easily-updateable manner, lab members are more likely to use them as a resource for their work and ensures that everyone is referencing the same document. The SOPs include photos and suggested reading links.



CUSTOM CHECKLISTS FOR TRAININGS AND POLICIES

Dunham Lab
Genome Sciences, School of Medicine

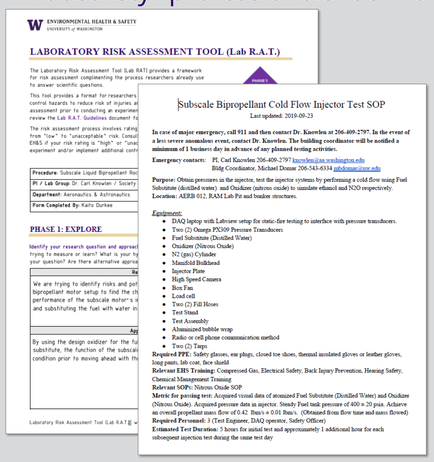


One challenge chemical hygiene officer, Emily Mitchell, repeatedly encounters with safety management is that there is no checklist of all the things we should do. There is often more information about what NOT to do. To assist with orienting new staff and students to work in the lab, she put together a checklist of all the activities and trainings they should complete before starting work. The checklist is updated as practices change.

INCLUDING STUDENTS IN RISK ASSESSMENT AND SOP DEVELOPMENT

Society for Advanced Rocket Propulsion (SARP)
Aeronautics and Astronautics, College of Engineering

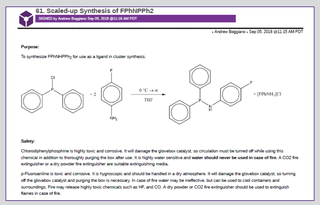
The UW student rocket club carries out testing with energetic subsystems necessary for high-powered rocketry. Because these events involve energetic substances and/or compressed gas releases, great care is taken in the planning of the experiments. Students fill out risk assessments and write SOPs, which are then sent to EH&S for evaluation. Via this process, the SARP team gains invaluable insight into what safety professionals look for and, after iteration, ultimately end up with an SOP that enables the testing to be carried out with proper safety precautions and without incurring unnecessary risks.

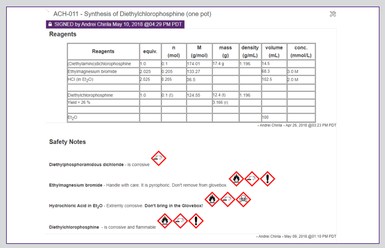


RISK EVALUATION SOFTWARE

Velian Lab
Chemistry, College of Arts & Sciences

This chemistry lab uses an electronic lab notebook called LabArchives, which is a cloud-based program that allows researchers to store and organize their work documents and data. The program includes a safety section where lab members can add and comment on the hazards associated with each particular experiment they are conducting. This allows the lab and PI to discuss and assess hazards as part of their experiment planning.

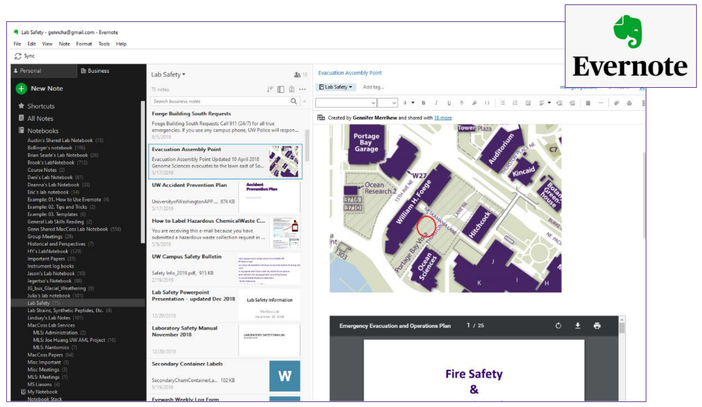




ELECTRONIC CHEMICAL HYGIENE PLAN

MacCoss Lab
Genome Sciences, School of Medicine

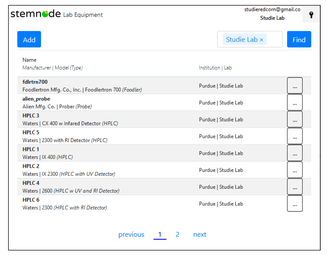
Gennifer Merrihew, the chemical hygiene officer for the lab, decided to use downloadable software called Evernote to electronically store the lab's chemical hygiene plan. The app allows lab members to store and access documents, photographs, presentations, and saved web content that is relevant to their safety practices and policies, as well as safety manuals, assessments, and records.



SHARED EQUIPMENT INVENTORY APP

Raymond RedCorn
Civil and Environmental Engineering, College of Engineering

In collaboration with researchers at Purdue, this post-doc has developed an equipment inventorying and sharing app called StemNode. It has the ability to store comments on specific pieces of equipment so that people can communicate with each other about any issues. Labs can add their own equipment to the app for free and develop their own inventory maintenance program or they can pay for an inventory to be built and maintained by the developers.



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REFRESHER TRAINING DAYS FOR THE WHOLE LAB

Nance Lab
Chemical Engineering, College of Engineering

In a short time period of ~two weeks, there were three safety incidents in the lab, all of which were independent and isolated. This raised concerns about the effectiveness of safety trainings previously conducted. The PI decided it was best to halt all lab operations and carry out new safety trainings. Each lab member had to participate in a safety training refresher session, limited to six people per session, which Rick Liao, the chemical hygiene officer, ran and the PI observed. There were four sessions over two days and an additional training session upon return for lab members who were out of lab for the summer. Once a lab member completed the training, they signed the EH&S training completed form, and the PI signed the form as their supervisor. This allowed them to return to lab work. There have been no safety incidences since.

REVISING PROTOCOLS TO REDUCE THE RISK OF FIRE

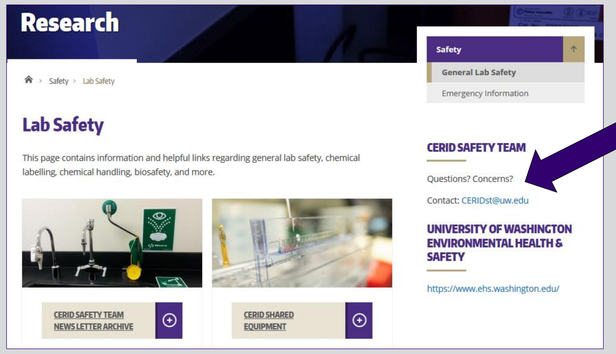
Kerr Lab,
Biology, College of Arts & Sciences

The lab has a protocol in which a "pin replicator" is used to make bacteria transfers. The replicator is made of stainless steel and is sterilized between transfers by immersion of the pins in ethanol and subsequent flaming. The PI and Katie Dickinson revised the lab's protocols and added an extra "water" step so the pins will not go back into the ethanol unless they have touched water first. This prevents accidentally setting the ethanol bath on fire.

INTERNAL SAFETY TEAM

Center for Emerging and Re-emerging Infectious Diseases (CERID)
Allergy and Infectious Diseases, School of Medicine

The CERID Safety Team was established to ensure a cohesive safety program and structure within their unit. The team meets quarterly to discuss safety incidents and updates to ensure a safer work environment. Their website has a safety section which serves primarily as a resource for researchers with helpful links and information.



Website includes:

- Emergency contacts
- Team newsletters
- Shared equipment information
- Hazardous waste practices
- Secondary container labels for chemicals
- PPE practices
- Safety bulletin board

CONDUCTING CROSS-INSPECTIONS WITH NEIGHBORING LABS

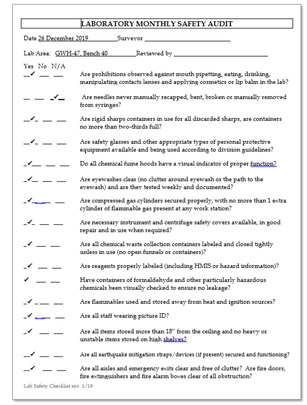
Gelb / Velian / Dalton Labs
Chemistry, College of Arts & Sciences

All laboratories who wish to participate in the cross-inspections were added to a list and were organized into groups of four labs based on their area of research or their location (e.g., NMR, mass spectrometry, organic chemistry, BSL-2, etc.). Lab groups were given a suggested schedule to conduct the surveys within the months of September, October, and November, so as to allow for a sufficient gap between each lab's self-survey and the official EH&S survey in the spring.

Labs are able to communicate within their group to determine a schedule that is flexible and works well for all. Not all four labs need to be present for every survey in their group. This practice allows the possibility to share ideas and spot problems that are more noticeable from an outside perspective.

ROTATING ASSIGNMENT OF SELF-INSPECTIONS

Coombs Lab
Lab Medicine, School of Medicine



LABORATORY MONTHLY SAFETY AUDIT

Date 26 December 2019 Surveyor _____

Lab Area: G03H-47, Bench 40 Reviewed by _____

Yes	No	N/A	
✓			Are prohibitions observed against mouth pipetting, eating, drinking, manipulating contacts lenses and applying cosmetics or lip balm in the lab?
		✓	Are needles never manually recapped, bent, broken or manually removed from syringes?
✓			Are rigid sharps containers in use for all discarded sharps, are containers no more than two-thirds full?
✓			Are safety glasses and other appropriate types of personal protective equipment available and being used according to division guidelines?
✓			Do all chemical fume hoods have a visual indicator of proper function?
✓			Are eyewashes clear (no clutter around eyewash or the path to the eyewash) and are they tested weekly and documented?
✓			Are compressed gas cylinders secured properly, with no more than 1 extra cylinder of flammable gas present at any work station?
✓			Are necessary instrument and centrifuge safety covers available, in good repair and in use when required?
✓			Are all chemical waste collection containers labeled and closed tightly unless in use (no open funnels or containers)?
✓			Are reagents properly labeled (including HMIS or hazard information)?
✓			Have containers of formaldehyde and other particularly hazardous chemicals been virually checked to ensure no leakage?
✓			Are flammables used and stored away from heat and ignition sources?
✓			Are all staff wearing picture ID?
✓			Are all items stored more than 18" from the ceiling and no heavy or unstable items stored on high shelves?
✓			Are all earthquake mitigation straps/devices (if present) secured and functioning?
✓			Are all aisles and emergency exits clear and free of clutter? Are fire doors, fire extinguishers and fire alarm boxes clear of all obstruction?

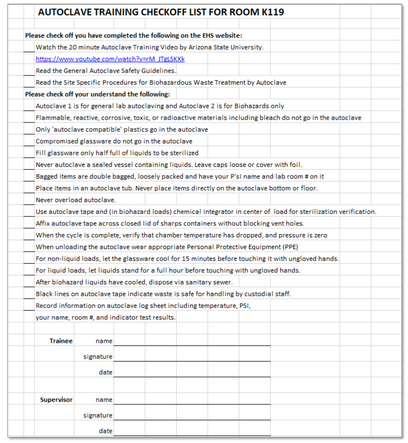
Lab Safety Checklist rev. 1/10

Each month Glenda Daza selects a different employee in the lab who must complete the survey documenting their current knowledge (e.g., the location of safety equipment, appropriate responses to spills, etc.). Glenda verifies that their answers are correct and identifies any areas that require refreshing. She also uses the monthly survey responses to identify topics that should be addressed in a lab meeting. When the lab temporarily relocated, every employee was required to go through a new survey as part of an orientation to the new work spaces.

TRAINING CHECKLISTS FOR AUTOCLAVES

Jane Ranchalis
Medical Genetics, School of Medicine

Jane manages two autoclave facilities. It can be difficult to keep track of users and they often include students with autoclaving duties. Although the doors have electronic locks, co-workers or PIs may give access to people who might not have completed training. User log sheets contained names that were not familiar, so now new users have to fill out a training sheet verifying they understand the proper use and safety practices for these specific autoclaves. These sheets are kept on file at the facility.



AUTOCLAVE TRAINING CHECKOFF LIST FOR ROOM K119

Please check off you have completed the following on the EHS website:
- Watch the 20 minute Autoclave Training Video by Arizona State University.
  https://www.youtube.com/watch?v=M_JTgi5KXk
- Read the General Autoclave Safety Guidelines.
- Read the Site Specific Procedures for Biohazardous Waste Treatment by Autoclave

Please check off your understand the following:
- Autoclave 1 is for general lab autoclaving and Autoclave 2 is for Biohazards only
- Flammable, reactive, corrosive, toxic, or radioactive materials including bleach do not go in the autoclave
- Only 'autoclave compatible' plastics go in the autoclave
- Compromised glassware do not go in the autoclave
- Fill glassware only half full of liquids to be sterilized
- Never autoclave a sealed vessel containing liquids. Leave caps loose or cover with foil.
- Bagged items are double bagged, loosely packed and have your P'si name and lab room # on it
- Place items in an autoclave tub. Never place items directly on the autoclave bottom or floor.
- Never overload autoclave.
- Use autoclave tape and (in biohazard loads) chemical integrator in center of load for sterilization verification.
- Affix autoclave tape across closed lid of sharps containers without blocking vent holes.
- When the cycle is complete, verify that chamber temperature has dropped, and pressure is zero
- When unloading the autoclave wear appropriate Personal Protective Equipment (PPE)
- For non-liquid loads, let the glassware cool for 15 minutes before touching it with ungloved hands.
- For liquid loads, let liquids stand for a full hour before touching with ungloved hands.
- After biohazard liquids have cooled, dispose via sanitary sewer.
- Black lines on autoclave tape indicate waste is safe for handling by custodial staff.
- Record information on autoclave log sheet including temperature, PSI, your name, room #, and indicator test results.

Trainee: name _____ signature _____ date _____

Supervisor: name _____ signature _____ date _____