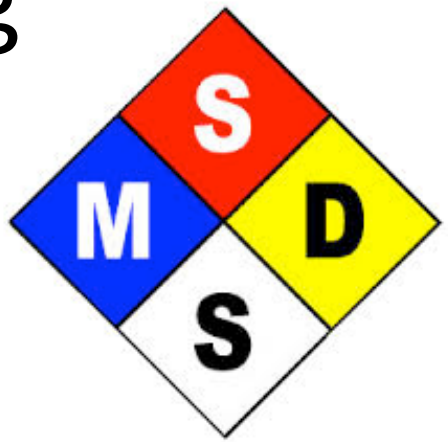
Lab Safety Training

Refresher



Everhart Lab

September 9, 2016

Why is safety important?

- It’s to protect you from injury or harm
- Also to protect other lab members
- It’s to protect people who work in our building
- Proper procedures ensure we have a safe workplace and environment

Dangers in lab can be deadly

- Example: 23yr old Sheri Sangji
- 2009 death in lab at UCLA
- She suffered severe burns from a fire that occurred on December 29, 2008 when a plastic syringe she was using to transfer the pyrophoric reagent *tert*-butyllithium from one sealed container to another came apart, spilling the chemical, and igniting a fire. Sangji **was working alone and not wearing a protective lab coat** and her clothing caught fire, resulting in severe burns that led to her death 18 days later.

Know the dangers

- What is the danger?
- How great is the danger?

How do you know how great the danger is?

- Where is the danger?
- Who is in danger?

Are others around you placing you in danger?

What should you do?

Visible dangers

- Fire
- Sharp glass
- Objects / water on the floor

Accidents happen…

"One lab member forgot glassware on a hot plate and cooked dry all the liquid. It continued heating till the glass exploded..."

Non-obvious Dangers

- Outlets
  - Electrical outlets
  - Gas outlets
  - Mixing up outlets….

"I once hooked up the glass vacuum filtration apparatus to the air instead of the vacuum. Glass exploded everywhere. Boom!"

Dress Code

- Don't wear clothes you care about
- No open-toed shoes
- Tie your hair back

"I once reached across a Bunsen burner and didn't have my hair tied back… GIRL ON FIRE!"

Bottom line…

Consider each situation and ask yourself:
Is what I'm wearing safe for what I'm doing?

Invisible Dangers

- Chemical contamination
  - Gloves
  - Pipettes
  - Lab coats
  - Hands
  - Cell phone

"I witnessed someone make a fungicide dilution without wearing gloves. I don't remember how, but the concentrated solution ended up all over their hands. They were quite distraught after reading the MSDS."

How do you know the dangers of each chemical?

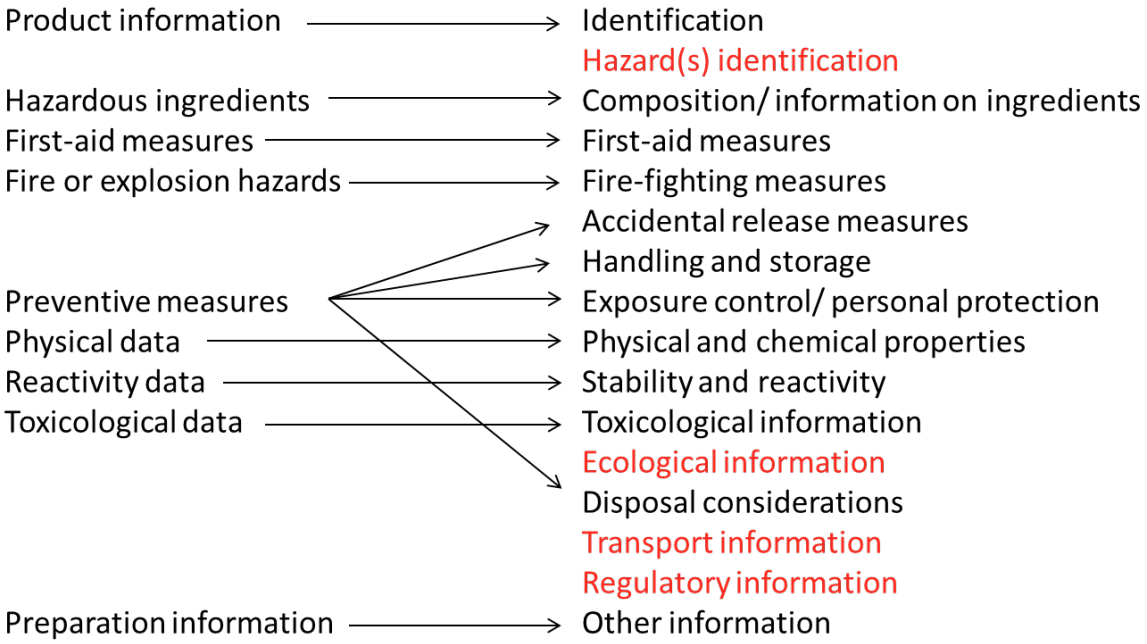
Material safety data sheets

16 categories on each safety sheet

1. Identification
2. Hazard(s) identification
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and Storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

How to locate MSDS?

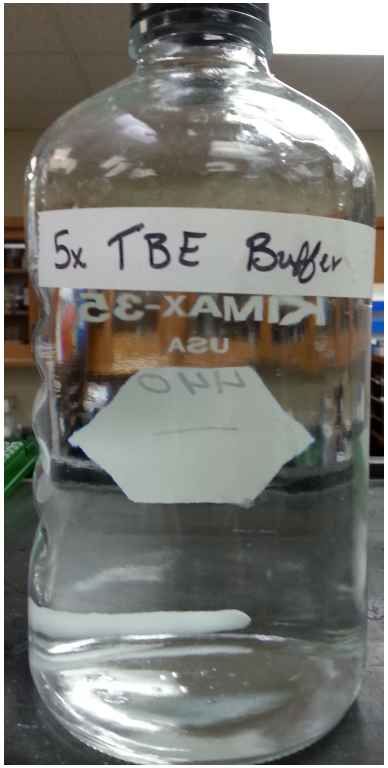
- Aunty Google!
- Google: Ethidium bromide MSDS
- Which sections are important to review?



Labeling

- Why is labeling important?
- What goes on a label?
- Label the sides of tube, not lid
- Beware of confusing characters:

s vs. 5
v vs. u
y vs. 4
j vs. u
i vs. l and I vs. l
6 vs. 9
2 vs. Z
d vs. a
M vs. W
0 vs. O
others?



Invisible Dangers

- Biological contamination
  - Gloves
  - Pipettes
  - Lab coats
  - Hands
  - Cell phone

"I told the lab technician never to open fungal cultures on open bench tops so spores don't escape into the lab. He did not follow my advice and got Coccidiomycosis and contaminated the room. He only had flu-like symptoms, but it can be fatal."

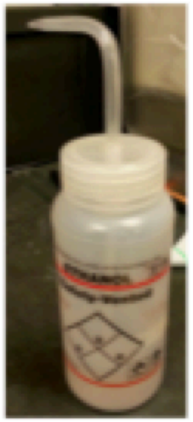
How do you know what dangers our pathogens pose?

Dangers from the organisms we work with

APHIS Regulated Plant Pathogens

In general, the organisms we work with pose no human threat. However, all are pathogens of economically important crops and regulated by the USDA Animal and Plant Health Inspection Service (APHIS). Below are some basic handling procedures for fungi in our lab:

1. Door to lab must remain locked and closed.
2. Transferring cultures must be done in the level-2 biosafety cabinet.
3. All cultures that are no longer needed for research must be disposed of properly, which means autoclaving before disposal in the trash. Read through the Autoclave Operation guide: http://ehs.unl.edu/sop/s-bio-autoclavesafety.pdf
4. All items that come into contact with these organisms must be autoclaved before disposal.
5. Wash your hands after completing work.
6. All work surfaces should be disinfested using 70% ethanol after use.
7. If a spill occurs, disinfest the area using 70% ethanol →



Dangers from Plant Pathogens

- Some plant pathogens, though rare, have been reported to infect immunocompromised humans: *Colletotrichum graminicola, Fusarium verticillioides,* and *Macrophomina phaseolina*
- Fusarium species are known to produce at least three different classes of mycotoxins, including fumonasins, tricothecenes, and zearaleone, which are known animal toxins <u>when consumed</u>
  - Both *F. verticillioides* and *F. graminearum* are known to produce mycotoxins.

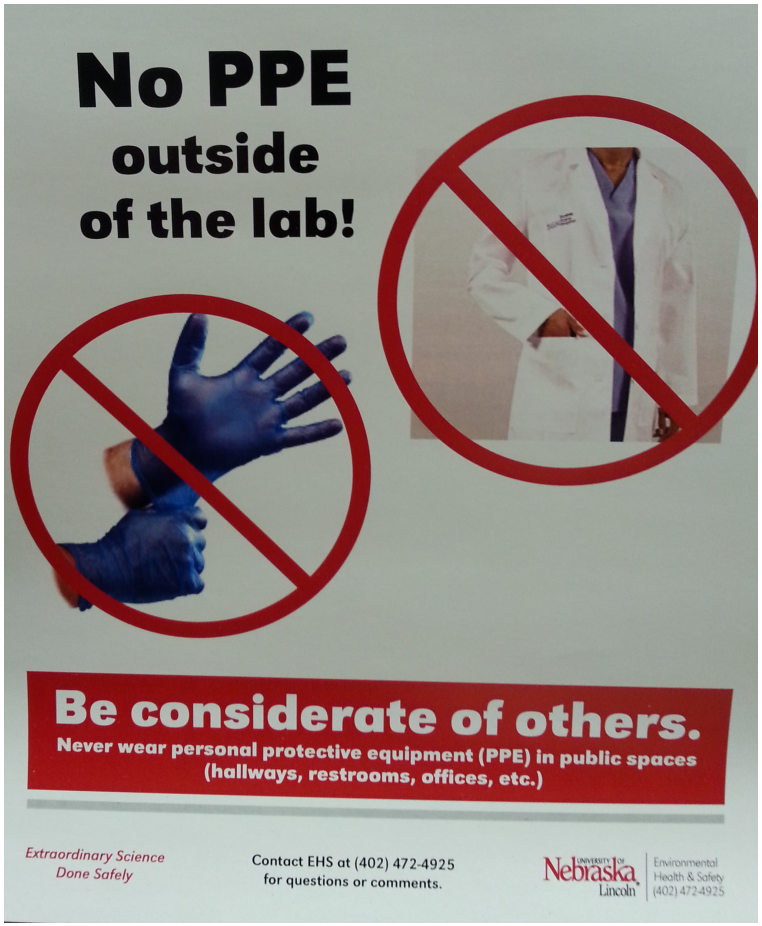
Biological Spill Kit

What are you protecting with gloves?

- Human health

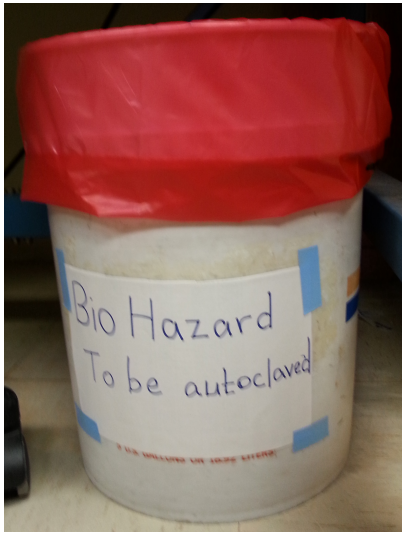
> ***"I once watched someone use a gloved hand to adjust an ethidium bromide stained gel and then take that gloved hand and ran it through his hair."***

- The experiment



Is this good practice?

Why do we autoclave trash?



- What do we autoclave?
  - Cultures with fungal growth
  - Any tubes, tips, or tape that may have come into contact with fungi
- What does not need to be autoclaved?

Make sure you've had autoclave training…

"I forced open an old fashion autoclave before it was completely depressurized. It makes a HUGE pop and hot liquid came shooting out."

What do you do if there's a fire?

1. The fire alarm is going off…

2. You notice someone in a lab knocked over an open container of ethanol near open flame and it caught on fire….

- Where is the fire extinguisher in our lab?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NOTICE
AUTHORIZED
PERSONNEL ONLY

What do you do for a water leak?

- You come into the lab and notice water dripping from the ceiling…

"I once left the millipore on to fill a carboy (that was not in the sink as it should have been) on a Friday afternoon and then went home. I got a phone call about three floors flooded on Saturday afternoon."

Communication is key…

"A postdoc shut the shaker incubator door really hard. Not understanding that there might be a cultural barrier to sarcasm, another postdoc shouts ***'jeez! Why don't you slam it harder???'***

So, he did -- another glass explosion."