MMRI Lab Safety Refresher

WELCOME!

UPDATE YOUR ZOOM PARTICIPENT NAME SO WE KNOW WHO YOU ARE IN THE ATTENDANCE LOG

- Find your video (right hand side of screen)
- Click on your video
- Select “rename” and change if needed

PLEASE MUTE YOUR MICROPHONE WHILE NOT IN USE

MMRI Lab Safety Refresher

MMRI Safety Programs and Contact Info
(handout: Contact List)

COVID-19 Hazards and Safety
(handout: references and resources)

Emergency Response & Evacuation

- Earthquake, Fire (handout), Injury, Spills

Hazard Communication

- Globally Harmonized Symbols (GHS)
- Safety Data Sheet (SDS)

Laboratory & Chemical Procedures

BioSafety Program

- Biological Safety Cabinet Handout

MMRI Contacts

EMERGENCY RESPONSE PERSONNEL AND PHONE NUMBERS ARE POSTED (see handout)

- Emergency Response, General Rep: Ajith, Jan
- COVID-19 Rep: Jan
- Laboratory Reps: Ajith, Jan
- Facilities: Ron
- Chemical Safety: Jan
- Biohazards & Biosafety: Ajith
- Radiation Safety: Jan/Ajith

MMRI Safety Programs

OSHA compliant permits and written programs

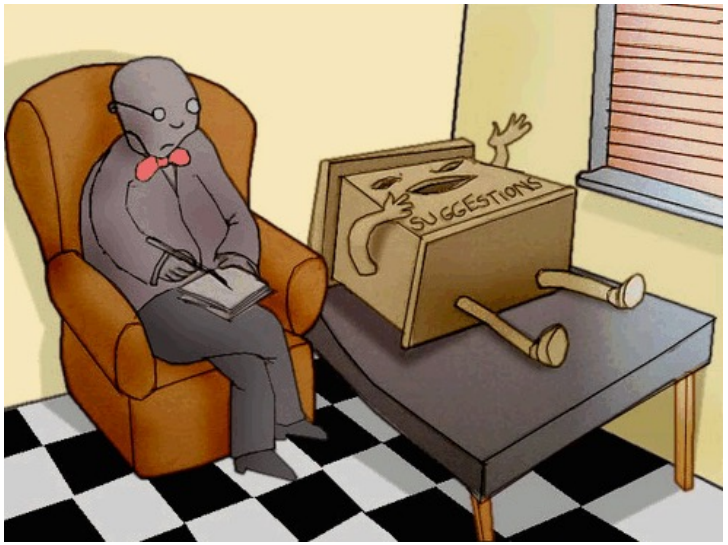
Each Affiliate is required to follow the MMRI policies and procedures

- **Injury and Illness Prevention Program** (IIPP) – Each Affiliate is responsible for generating and adhering to their own IIPP
- **COVID-19 Communication Program** (CCP)
- **Hazard Communication Program** (HCP)
- **Chemical Hygiene Plan** (CHP)
- **Biosafety Exposure Control Programs**
- **Radiation Safety Program** – Training Certification required

MMRI Safety Program Suggestions

- Employees and Affiliate Members are encouraged to submit safety suggestions.

- Anonymous complaints/suggestions can be submitted to Jan (mailbox).



COVID-19 Safety

CDC Recommendations For Protecting Yourself and Others

- Staying Up to Date with COVID-19 Vaccines
- Improving Ventilation and Spending Time Outdoors
- Moving indoor activities outdoors
- Getting Tested for COVID-19 If Needed
- Following Recommendations for What to Do If You Have Been Exposed
- Staying Home When You Have Suspected or Confirmed COVID-19
- Seeking Treatment If You Have COVID-19 and Are at High Risk of Getting Very Sick
- Avoiding Contact with People Who Have Suspected or Confirmed COVID-19
- Wearing Masks or Respirators as needed
- Increasing Space and Distance as needed

COVID-19: Cal-OSHA Non-Emergency Standards

Effective Feb 3, 2023

See Handout: "COVID-19 Prevention – Non-Emergency Regulation What Employers Need to Know"

- Employer regulations
- Includes some of the same requirements plus new provisions
- Easier for employers to provide consistent protections to workers
- Allows for flexibility if changes are made to the California Department of Public Health (CDPH) guidance in the future.

Notes:

COVID-19 Supplemental Paid Sick Leave Ended on December 31, 2022 but Workers Compensation is still available until Jan 2024.

COVID-19: California Department of Public Health

Effective March 13, 2023

See Handout: "Guidance on Isolation and Quarantine for COVID-19"

- Provides updated guidance for workplace settings and recommendations for general public
- Continuing to move away from more restrictive measures
- New definitions for: Isolation, quarantine, close contact, infectious periods, etc.
- Local health jurisdictions may continue to implement additional requirements that are stricter than statewide guidance based on local circumstances
- MMRI follows Santa Clara County Guidelines

COVID-19: Santa Clara County Public Health

Santa Clara County is following the new State Guidelines as of April 3, 2023

Businesses:
All businesses must follow Cal-OSHA Non-Emergency Standards
https://covid19.sccgov.org/business-guidance

General Public:
https://covid19.sccgov.org/covid19-guideline

See handout: "SCC COVID-19 Guidelines for the General Public"

What to do if you:

- Test positive for COVID-19
- Have symptoms of COVID-19
- Have been exposed to someone with COVID-19 and do not have symptoms

COVID-19: CURRENT INFORMATION RESOURCES

See Handout that contains the most current links to COVID-19 critical agencies:

- Centers for Disease Control (CDC)
- Cal/OSHA
- California Labor Commission
- California Department of Public Health
- Santa Clara County Public Health

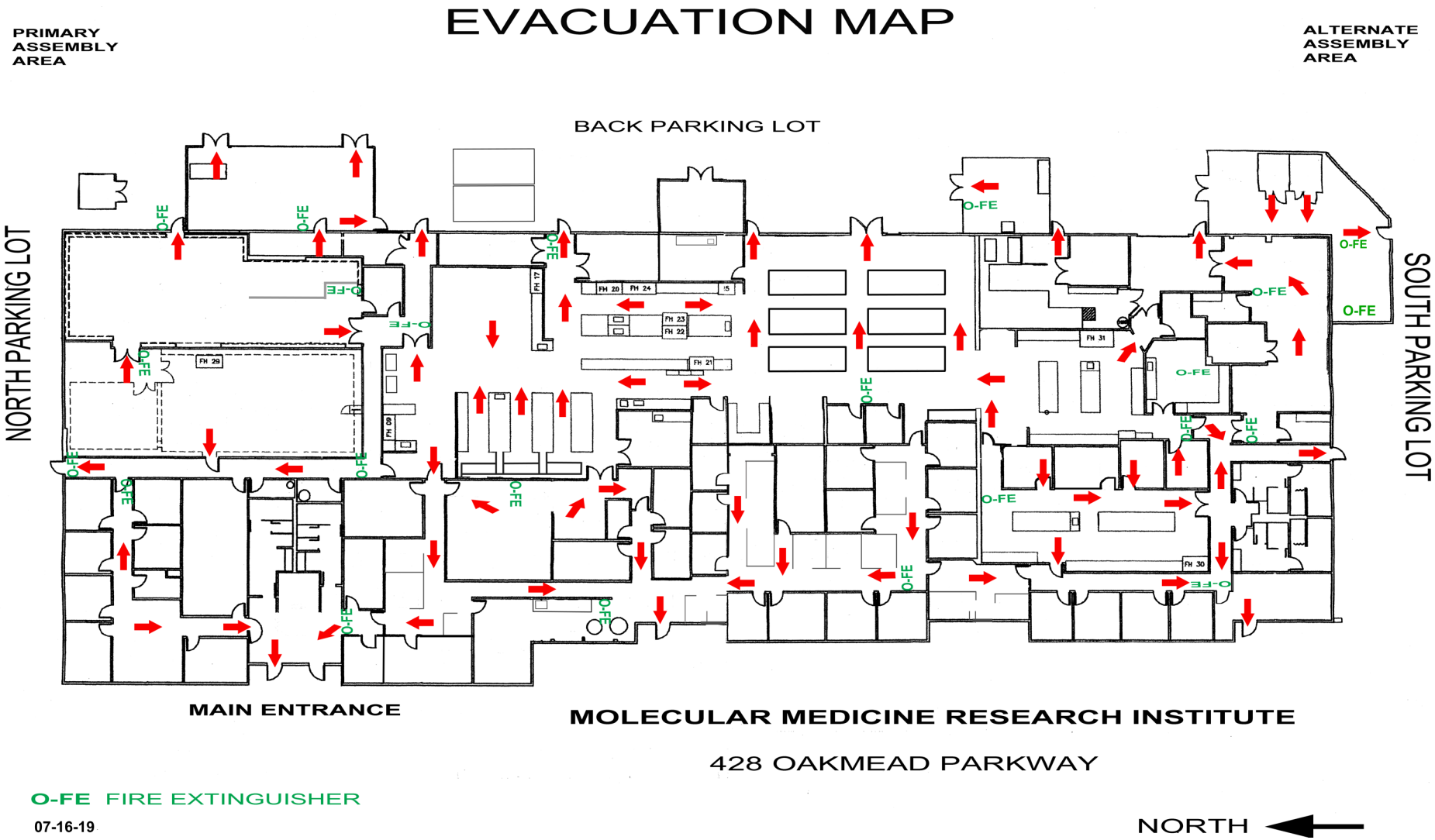
EMERGENCY RESPONSE & PROCEDURES

Evacuation:

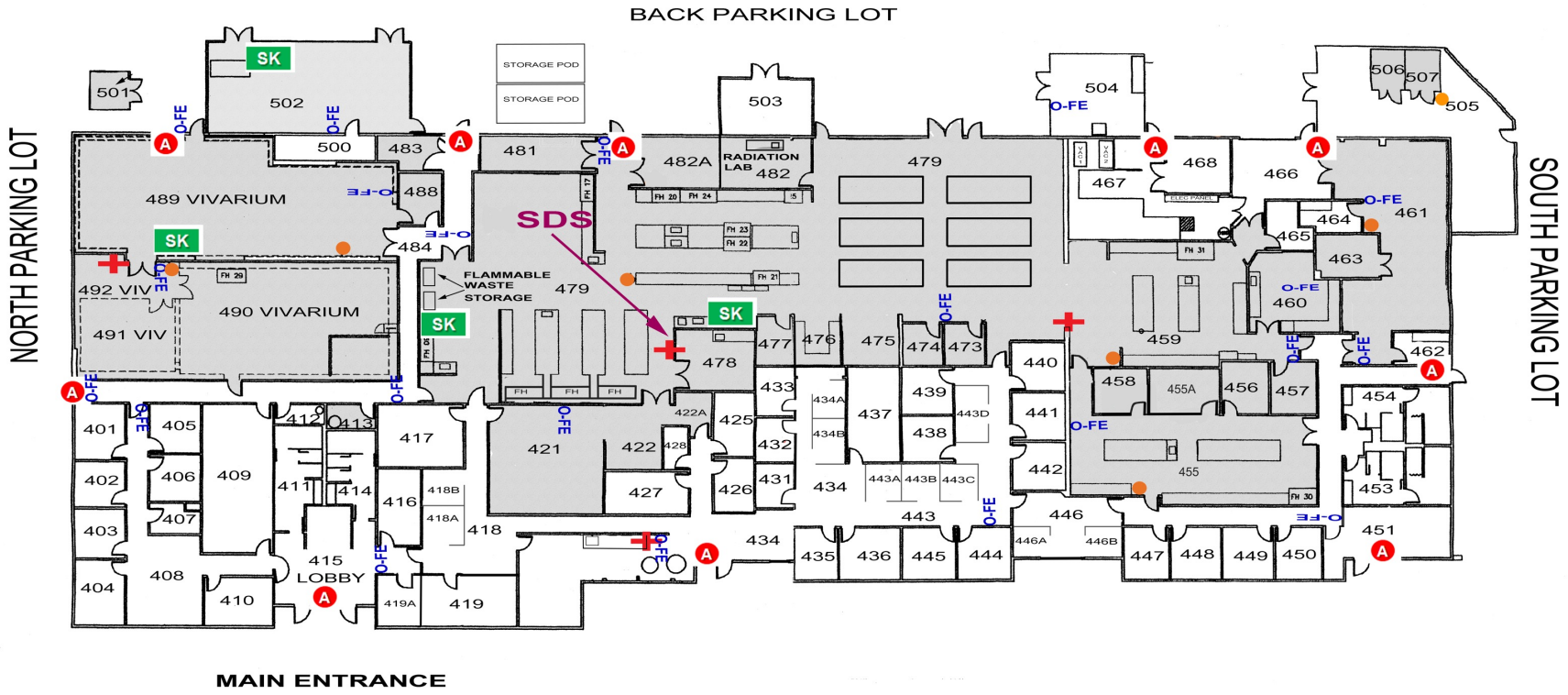
- If fire alarm rings, evacuate immediately.
- Go to assembly area and check in (see map).
- Wait for instructions.
- After Hours: Contact Jan or Ajith

See the posted Contact list.

Evacuation Assembly Area



Emergency Equipment

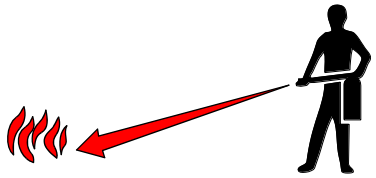


April 13, 2023

MMRI

Fire

- Fire Pull Stations are located throughout the perimeter of the building (see map)
- Sound alarm, Fire Department will be automatically called.



- Know where nearest extinguisher is located.
- Review Fire Extinguisher Brochure

Earthquakes

Prepare...Before the ground shakes

- Keep walkways and exit corridors clear.
- Store large heavy items below eye level.
- Store liquid chemicals in secondary containment and/or in the chemical cabinet. Keep cabinet doors closed when not in use.
- Store solids on shelves with a rim or door.
- Keep gas cylinders secured.

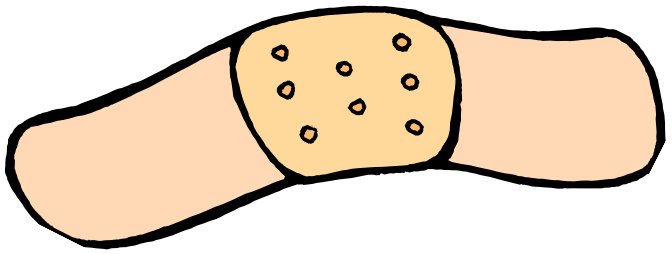
Earthquakes

When the ground shakes

- If **outside**, stay outside. Move away from buildings, trees, streetlights and overhead lines. Crouch down and cover your head
- If **inside**, drop under a sturdy desk or table and hold on to one leg of the table or desk. Protect your eyes by keeping your head down.
- Wait in your safe place until the shaking stops.

Workplace Injuries/Illnesses

- For life threatening emergencies, call 9-1-1. Go to nearest hospital or call for transportation.
- For other work-related incidents, go to an Approved Medical Provider.
  - Contact your Worker's Compensation Insurance for a list of Approved Medical Providers.
- First aid kits are located throughout the building (see map).



Workplace Injuries/Illnesses

- Report all injuries IMMEDIATELY:
  - to your supervisor;
  - to your Worker's Compensation Insurance if the injury is more than a First Aid incident.

- Investigation and report of incident in writing may be required.

NOTE: It is the responsibility of individual affiliate organizations to administer and disseminate workers compensation insurance information and policies to their employees.

Chemical Exposures

If you or a co-worker experience adverse symptoms from a chemical exposure, do the following:

1. Remove employee from exposure.
2. Provide First Aid as needed.
3. Obtain medical help as needed.
4. Notify your supervisor and MMRI (Jan).
5. An evaluation and investigation of the incident and source of exposure may be warranted.

NOTE: If you feel ill from a chemical exposure, you are most likely over exposed. Do not ignore symptoms.

First Aid – Chemical Exposure

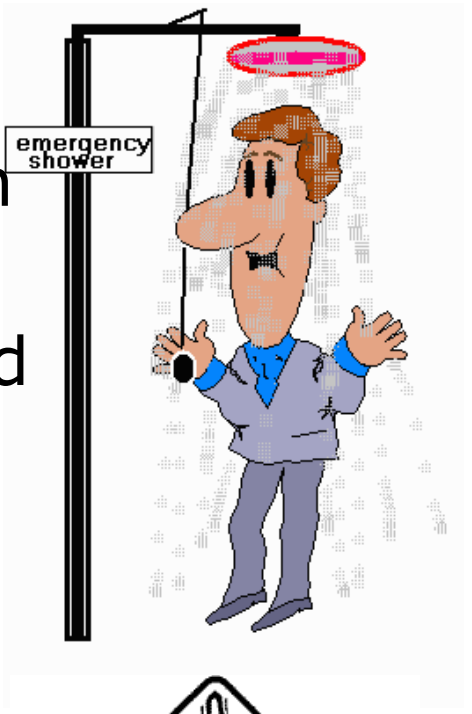
Eye Contact: Flush with large amounts of water for at least 15 minutes. Lift both upper and lower eye lids occasionally. Obtain medical help if irritation persists.

Skin Contact: Thoroughly wash affected areas with water, remove contaminated clothing, and obtain medical help if irritation persists or large body areas are affected.

Inhalation: If overcome or affected by vapors, move to fresh air and obtain medical help.

Eye Wash & Shower Stations

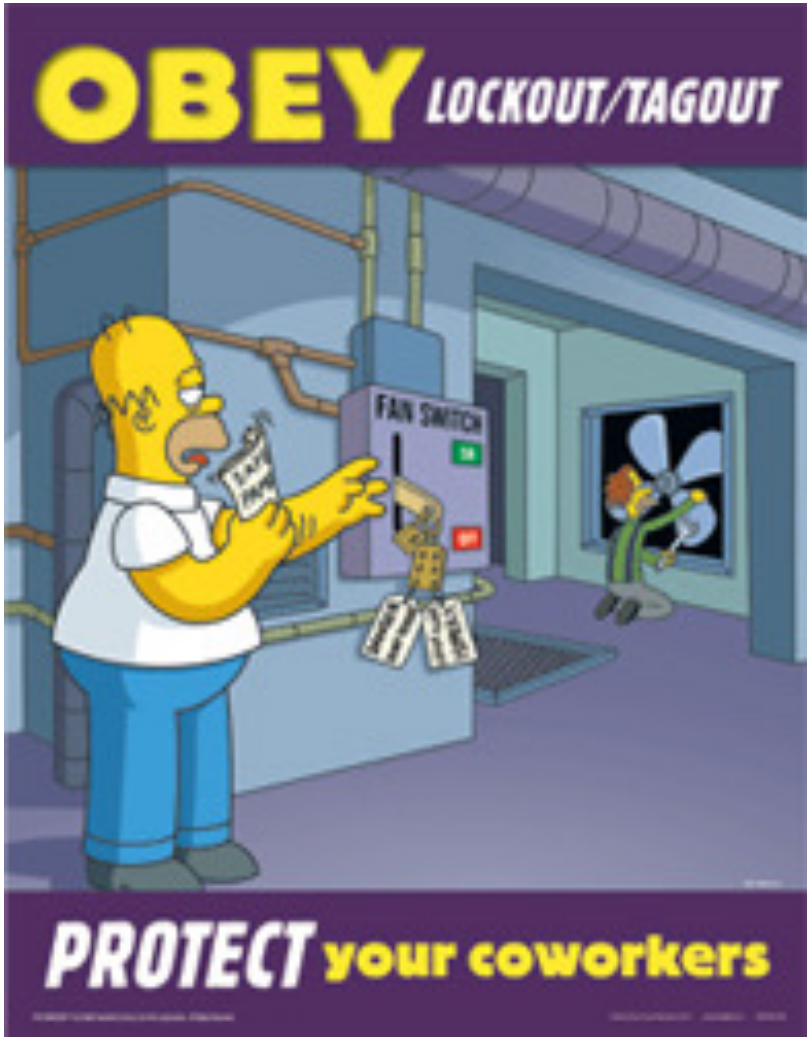
- For chemical exposure to eyes, skin or clothing, use the eyewash station or shower.
- Eye wash/shower station are located throughout the building (see map)



Be familiar with the operation of the eyewash station ***before*** an incident occurs.

Caution: all EW/Showers are foot pedal operated.

Lockout/tagout & Electrical Safety Awareness



- Contact Jan if you need to de-energize equipment.
  - Unplugging equipment does not require notification.
- Do not remove a lock or tag. Only the person that put the lock on can remove it.

HAZARD COMMUNICATION

Globally Harmonized System (GHS)

The GHS is a logical and comprehensive approach to:

- Defining health, physical and environmental hazards of chemicals;
- Creating classification processes that use available data on chemicals for comparison with the defined hazard criteria; and
- Communicating hazard information, as well as protective measures, on labels and Safety Data Sheets (SDS).

GHS Pictograms (Hazard Statements)

Irritant
Dermal Sensitizer
Acute toxicity (harmful)
Narcotic Effects
Respiratory Tract Irritation

Carcinogen
Respiratory Sensitizer
Reproductive Toxicity
Target Organ Toxicity
Mutagenicity
Aspiration Toxicity

Acute
toxicity
(severe)

Explosives
Self Reactives
Organic Peroxides

Flammables
Self Reactives
Pyrophorics
Self-Heating
Emits Flammable Gas
Organic Peroxides

Gases Under
Pressure

Corrosives

Oxidizers

Environmental
Toxicity

Safety Data Sheets (SDS)

As of June 1, 2015, the Hazard Communication Standard (HCS) requires new SDSs (formerly MSDS) to be in a uniform format, with 16 well-defined headings:

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 (non-mandatory)
13: Disposal Considerations (non-mandatory)
14: Transport Information (non-mandatory)
15: Regulatory Information (non-mandatory)
16: Other Information

Employers must ensure that SDSs are readily accessible to employees. MMRI SDS can be found in the main lab.

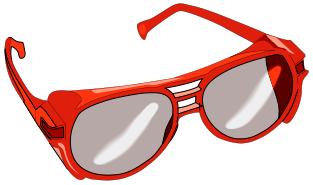
SDS and Chemical Inventory

Each Organization is responsible for:

- Provide MMRI copies of SDS's of your chemicals with each new purchase.
- Annual Chemical Inventory (end of June)
  - Format is provided by MMRI.
  - Provides information for the HazMat Permit

Laboratory Safety

Minimum Requirements For Entry Into the Lab:

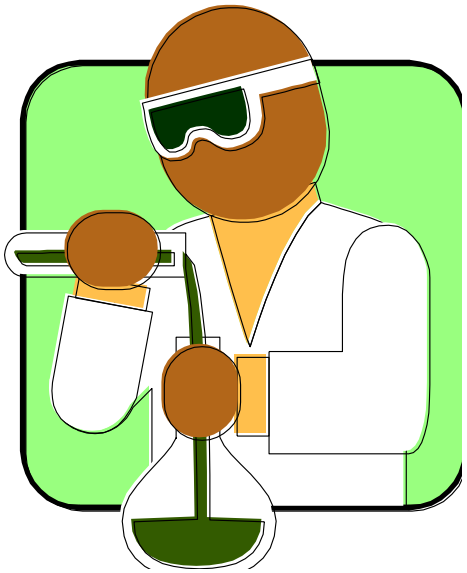


- Safety Glasses
- Lab Coats
- Close-toed shoes
  - NO OPEN-TOED, i.e. flip-flops/sandals

- Each organization is responsible for purchase of protective equipment.
- MMRI provides lab coat rentals to Affiliates for a minimum fee.

Laboratory Safety

Hazardous Chemicals:



- Ingestion, inhalation, skin or eye contact can have local or systemic effect
- Protect yourself by knowing what the chemical can do and how to prevent exposure before beginning work.
  - REVIEW YOUR ORGANIZATION'S **CHEMICAL HYGIENE PLAN.**
  - Use the SDS to get the safety data that you need to assess the risk.

SDS Binder is located in main lab.

Laboratory Safety

- No lab coats outside of the lab
- No eating, drinking, gum chewing in lab
- No storage of food in labs
- Keep your work area clean
- Respirators are prohibited

  Contact Jan if you suspect a respirator is necessary

- Hazardous chemicals (fumes, vapors, gas) are used in chemical **fume hood**

Laboratory Safety

- Oral pipetting of any substance is prohibited in any laboratory.
- Long hair must be tied back or restrained.
- Hands must be washed after gloves are removed, before leaving the laboratory, and at any time after handling materials known or suspected to be contaminated.

Container Labeling

- Minimum Labeling Requirement:
  - **Common Chemical name**
  - **Hazard** Associated with the Chemical
- Date Chemicals upon receipt and when opened

Chemical Storage

- Physically separate incompatible materials.
- Store flammables in:
  - flammables storage cabinet.
  - secondary containers when on the bench.
- Acids and bases are stored separately on low shelves and in plastic trays
- **Return all chemicals** to designated storage area when done.

-Review Chemical Segregation Handout

-See Jan for storage areas for your chemicals.

Chemical Spills

Be familiar with available spill kits and their limitations.

Design experiments to include a spill clean-up plan, including appropriate gloves and face protection.

- Use appropriate spill absorbent and contact Jan for hazardous waste disposal arrangements.
- Notify Jan of any spills. For spills down a drain, notify Jan immediately.
- Know when to call for help, e.g., extremely toxic material, >1L flammable liquid

MMRI Chemical Waste Streams

- Waste Streams:
  - Dry Lab Waste
  - Organic Solvents
  - HPLC Waste
  - Corrosive Waste
  - Formaldehyde Waste
  - New waste streams: Notify Jan

- Each Affiliate organization is responsible for the cost of their chemical waste disposal

Note: Radioactive and Biohazard Waste are handled separately.

Chemical Waste Labeling

- CA Compliant Labels Only!

- MMRI waste labels can be found near SDS binders in main lab

- Complete the label with:
  1. Company name
  2. Start date – **important!**
     - **WASTE CANNOT BE MORE THAN 1 YEAR OLD (CLASS II VIOLATION)**
  3. Name of chemical(s)
  4. Amount, concentration, or percent of each component.

Chemical Waste Management

- **NO CHEMICALS DOWN THE SINK**
- **Storage of Waste**
  - Keep incompatible chemicals separate and in a chemically compatible container.
  - Combine only miscible solutions.
  - Organic Solvents: bottles in solvent cabinet.
  - Waste pump oil: leak proof container.
- **Contact Person:** Jan

BIOSAFETY PROGRAM

MMRI Institutional Biosafety Committee

Ajith Welihinda, BSO

Jan Rydzewski, Alternate BSO

BioSafety Program

- Goal: Promote safe laboratory practices & procedures
- MMRI has Standard Operating Procedures (SOPs) to be followed. SOPs can be found on MMRI internal website.

- Annual Training is Required:
  - MMRI provides Biosafety training once a year.
  - For those working with potentially infectious materials, Bloodborne Pathogens training is required. See Jan for access to on-line training.

BioSafety Program

- Laboratory Director/PI Responsibilities:
  - Laboratory personnel are up-to-date on their HepB immunization
  - Ensure SOPs are followed and containment facilities are adequate
  - Ensure that labeling, storing, and using biohazardous agents are in compliance
  - Ensure that an up-to-date inventory of biohazardous agents in the lab is maintained

Recombinant or Synthetic DNA/RNA Work

- Assess the risk of the agent(s).
- For risk group classification, check NIH Guidelines for recombinant or synthetic nucleic acid molecules:

  https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf

- Commonly used bacterial plasmids, baculovirus and AAV vectors pose little or no risk to human health. They can be manipulated on an open bench.
- Lentiviral vectors (including 3rd generation vectors) require BSL-2 level containment.

Microbial Cell Culture

- Assess the risk of the organism(s). Risk group classification of your organism can be found at http://www.absa.org.
- Common laboratory strains such as *E. coli K-12*, *Saccharomyces and B. subtilis* present minimal or no risk to researchers.
- Any hazard present can be controlled by standard laboratory practices.
- Work can be performed on an open bench.
- For more info, check CDC website: https://www.cdc.gov/labs/BMBL.html

Mammalian Cell/Tissue Culture

- Only certified users can work in TC room.
- All cell lines should be considered potentially hazardous.
- When handling mammalian blood or tissue, assume that infectious agents are present.
- Report any accidental exposures (fluid to fluid contact) or needle stick type injuries immediately to Jan and your employer.

Mammalian Cell/Tissue Culture

Disposal of Tissue Culture Waste

Liquid waste

Aspirated media, cell suspensions, unused media containing serum and buffers must be treated with a final concentration of 10% household bleach (0.5% sodium hypochlorite; minimum of 30 minutes).

All liquid waste, once treated with 10% bleach may be discarded with running water down the sink.

Bleach containing solutions being discarded down the sink CANNOT BE AT CONCENTRATIONS GREATER THAN 10%.

Mammalian Cell/Tissue Culture

Disposal of Tissue Culture Solid Waste

ALL BIOHAZARD WASTE CONTAINERS MUST HAVE A LID

- Plastic Pipettes ➔ large red sharps container
- Sharps (needles, glass pipettes) ➔ small red sharps containers
- Plasticware (non sharps) ➔ red bin (red bag lined)

Mammalian Cell/Tissue Culture

Responsibilities of All Tissue Culture Room Users

- Read/understand Tissue Culture SOP
- Cleaning up after you have finished your work
- Clean up spills in hood immediately
- Removal of items from hood when done
- Rinsing of tube to aspirated waste flask with 10% bleach
- Disposal of waste into appropriate containers
- Emptying aspirated waste flasks
- Emptying dry waste bin

Mammalian Cell/Tissue Culture

Responsibilities of All Tissue Culture Room Users

- Advise MMRI personnel of any problems with hoods, incubators, equipment and gas supply.
- MMRI supplies bleach, red bags, sharps containers, CO2 gas. Advise MMRI personnel when out of these supplies.
- Everyone supplies their own alcohol.

BioSafety Program

- Clean Up Spills in Refrigerator or freezers immediately.
- Follow SOP for all decontamination procedures.
- All containers must have a tight fitting lid.
- Freeze waste that can potentially smell. Notify Jan for waste pick-up.

Sharps Containers

Red Containers are for blood/tissue exposed sharps only.

Close and place in biohazard storage area when ¾ full.

Yellow containers for other sharps.

Keep sharps containers readily available. Do not leave sharps unattended.

Animal Tissue

- ALL animal tissue and carcasses must be stored in DOUBLE biohazard bags at -20^{o}C until disposal.

- All frozen tissue/carcasses are picked up by Trilogy Medwaste for disposal within 30 days.

HOMEWORK

1. Know location of exits and fire extinguishers
2. Know location of eyewash and safety showers
3. Know your approved medical providers in case of emergency
4. Review the Safety Data Sheets of new chemicals before you use them
5. Know chemical waste disposal procedure before generating the waste
6. Review biosafety risks of agents/procedures before using them
7. Keep up to date on annual safety training requirements (e.g. BBP training)