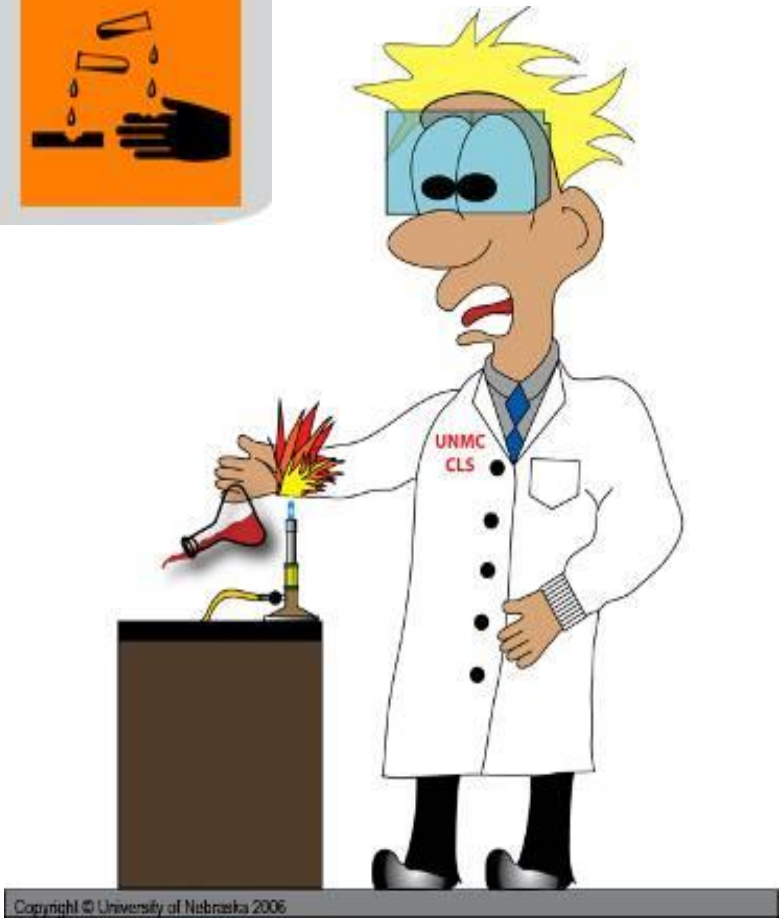
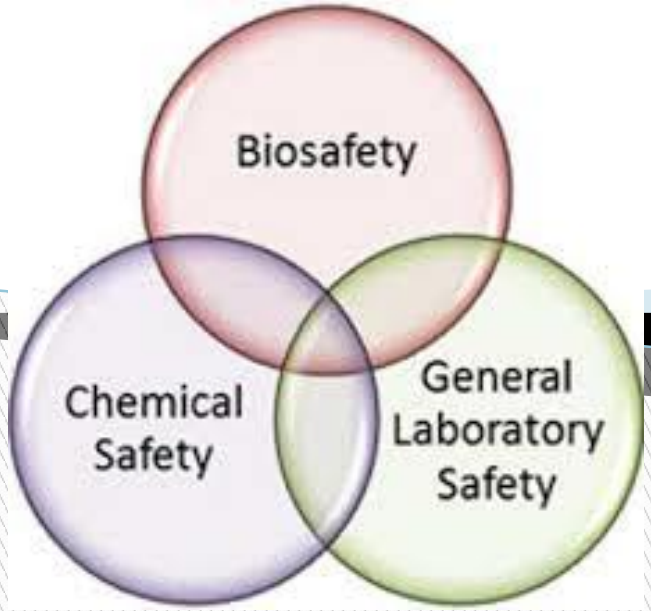
INTRODUCTION OF LAB SAFETY PROCEDURES





Objectives

- *Upon completion of this topic, student will be able to:*

- Define chain of infection and the laboratory safety.
- Know the importance of Standard Precautions.
- Describe the types of personal protective equipment that laboratory personnel wear.
- Recognize standard hazard warning symbols.
- Explain general safety requirements for the laboratory.

- **Safe Laboratory Practices:**
  - The laboratory contains a variety of safety hazards, many of which are capable of producing serious injury or life threatening disease.
  - To work safely in this environment, laboratory personnel must learn what **hazards exist**, the **basic safety precautions** associated with them, and **how to apply the basic rules**.

Types of Safety Hazards

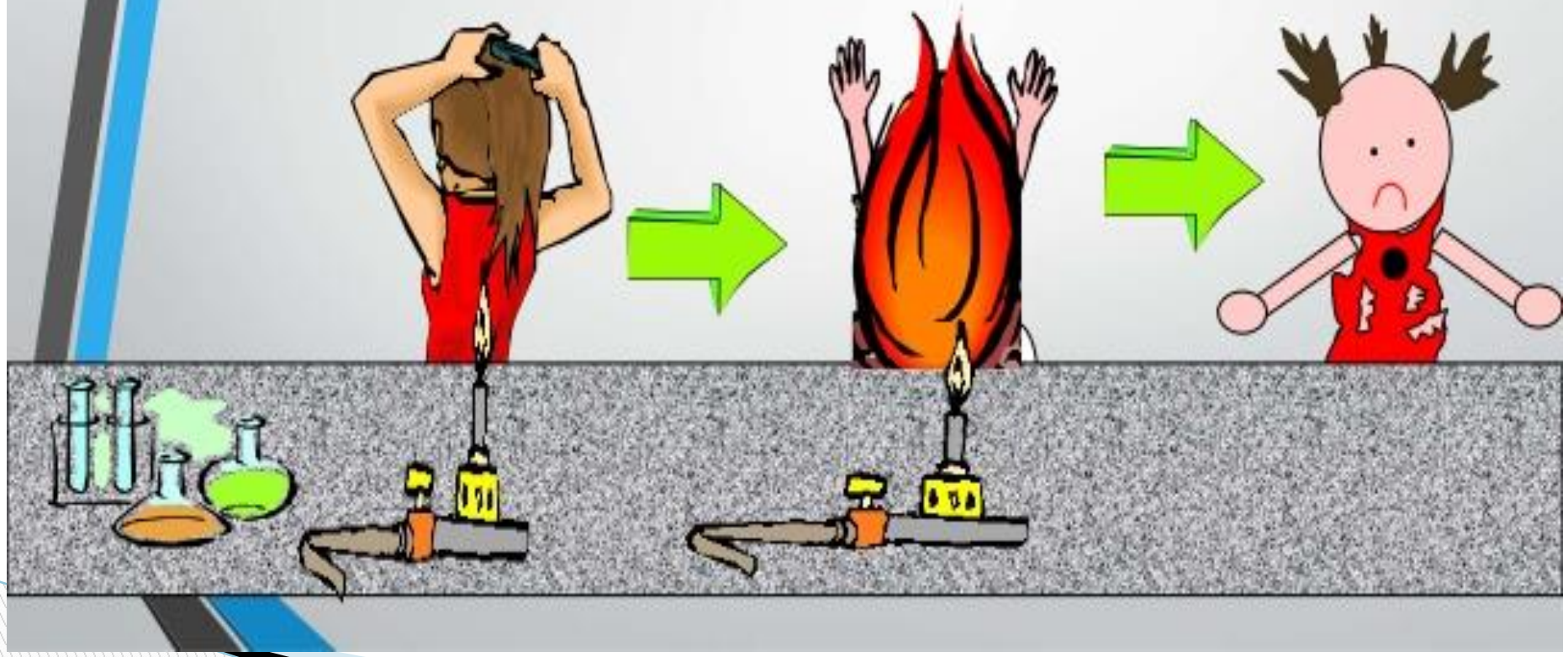
Type	Source	Possible Injury
1. Biological/ Microbial	Infectious agents	Bacterial, fungal, viral, or parasitic infections
2. Sharps/ Glassware	Needles, lancets, broken glass	Cuts, punctures, or blood-borne pathogen exposure
1. Chemical	Preservatives and reagents	Exposure to toxic, carcinogenic, or caustic agents
1. Radioactive	Equipment and radioisotopes	Radiation exposure
1. Electrical/ Equipment	Ungrounded or wet equipment; frayed cords	Burns or shock
1. Fire/ explosive	Bunsen burners, organic chemicals	Burns or dismemberment
7. Physical/ Unsafe premise	Wet floors, heavy boxes	Falls, sprains, or strains

Standard Precautions

- ✓ Working without supervision is always forbidden.
- ✓ Performing unauthorized experiments or any experiment at unauthorized time is also forbidden.
- ✓ Loose hair and clothing must be restrained. Clothing worn should be capable of providing a barrier between your skin and the chemicals.
- ✓ Eating, drinking, smoking and applying cosmetics are forbidden.
- ✓ All accidents must be reported to an instructor.

TIE BACK LONG HAIR

Tie back long hair and loose clothing when working near an open flame : Roll up long sleeves



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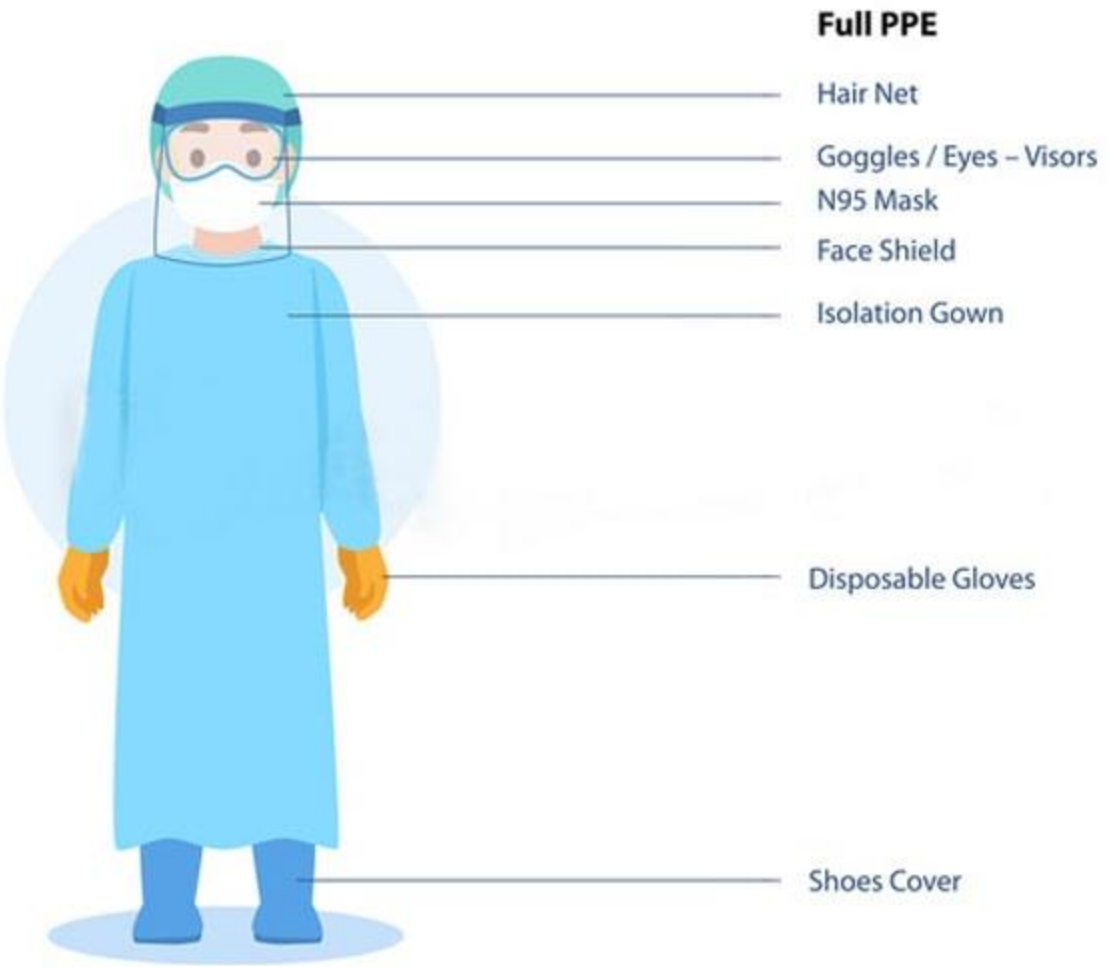
- During practical, **pipetting by mouth is also forbidden.**
- **When needed, gloves must be worn.**
- You m**ust have to know the location and proper use of all laboratory safety equipment,** including eyewash, safety shower, fire extinguishers, and telephone.
- M**ust know the emergency exit of laboratory.**
- Items such as book bags, backpacks, purses and mobile phones should be put out of the way off the floor and lab bench.

- ✓ You should have your complete stationary including a note book to note down observations/results of the experiment.
- ✓ Cell phones should be turned off before entering the laboratory.
- ✓ Read labels and disposes of any waste in an appropriate waste container.
- ✓ Make sure you wash and put away all equipment before you leave the laboratory.
- ✓ Never touch your face, mouth or eyes in lab. Never suck pens or chew pencils
- ✓ Always wash your hands before you leave and especially before eating.
- ✓ Inform your instructor at the beginning of the term if you have any special medical conditions that may need attention during the laboratory, such as known allergies or seizures.

Personal Protective Equipment

- PPE used in the laboratory includes gloves, fluid-resistant gowns, eye and face shields.



- In the laboratory, they are changed whenever they become noticeably contaminated or damaged and are always removed when leaving the work area.
- Wearing gloves is not a substitute for handwashing.
- A variety of gloves are available, including sterile and nonsterile, powdered and unpowdered, and latex and nonlatex.
- Allergy to latex is increasing among health-care workers, and laboratory personnel should be alert for symptoms of reactions associated with latex.

Handwashing

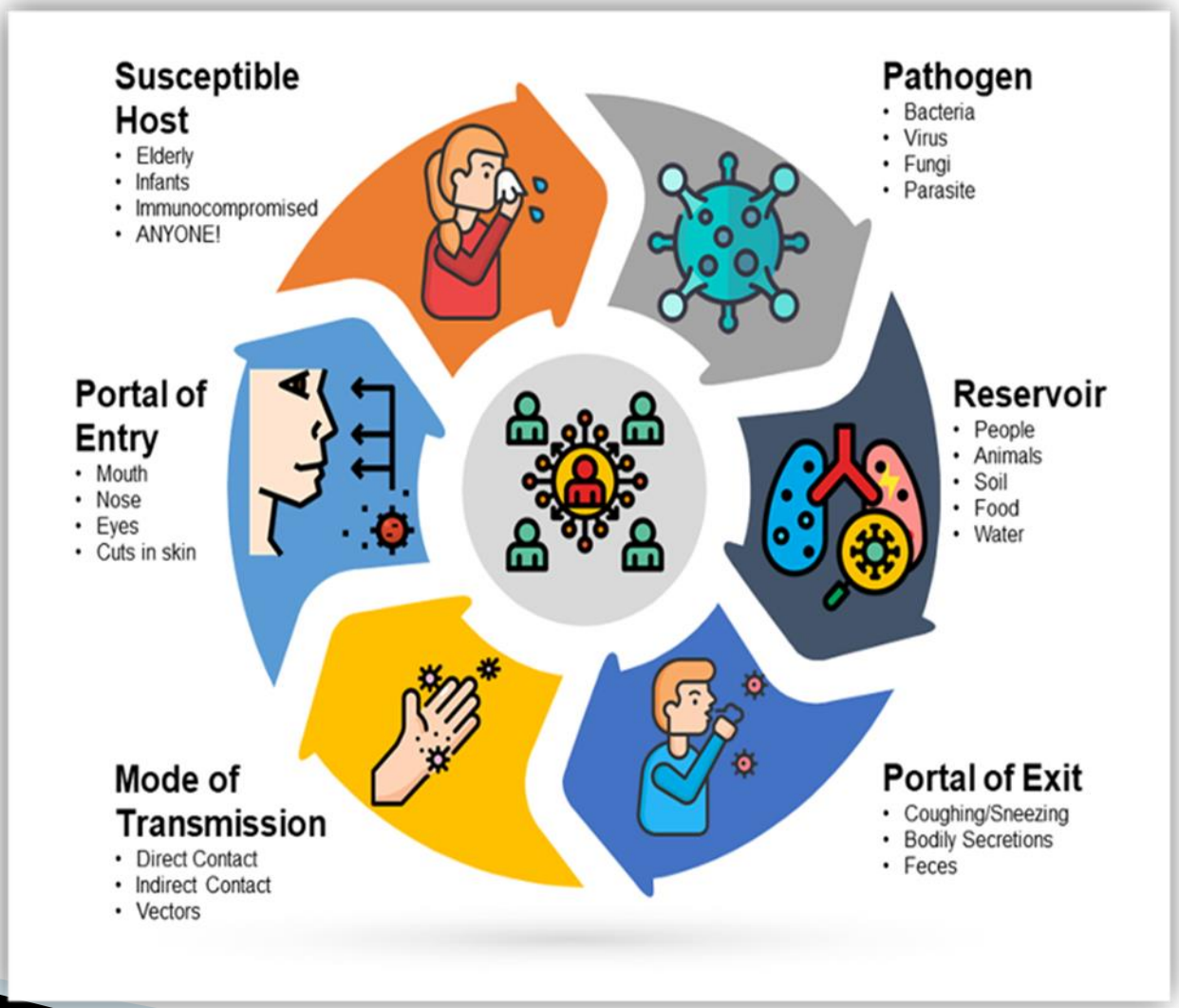
- Hand contact is the primary method of infection transmission.
- Laboratory personnel must always wash hands after gloves are removed, prior to leaving the work area.

Commonly used Signs and Symbols in labs

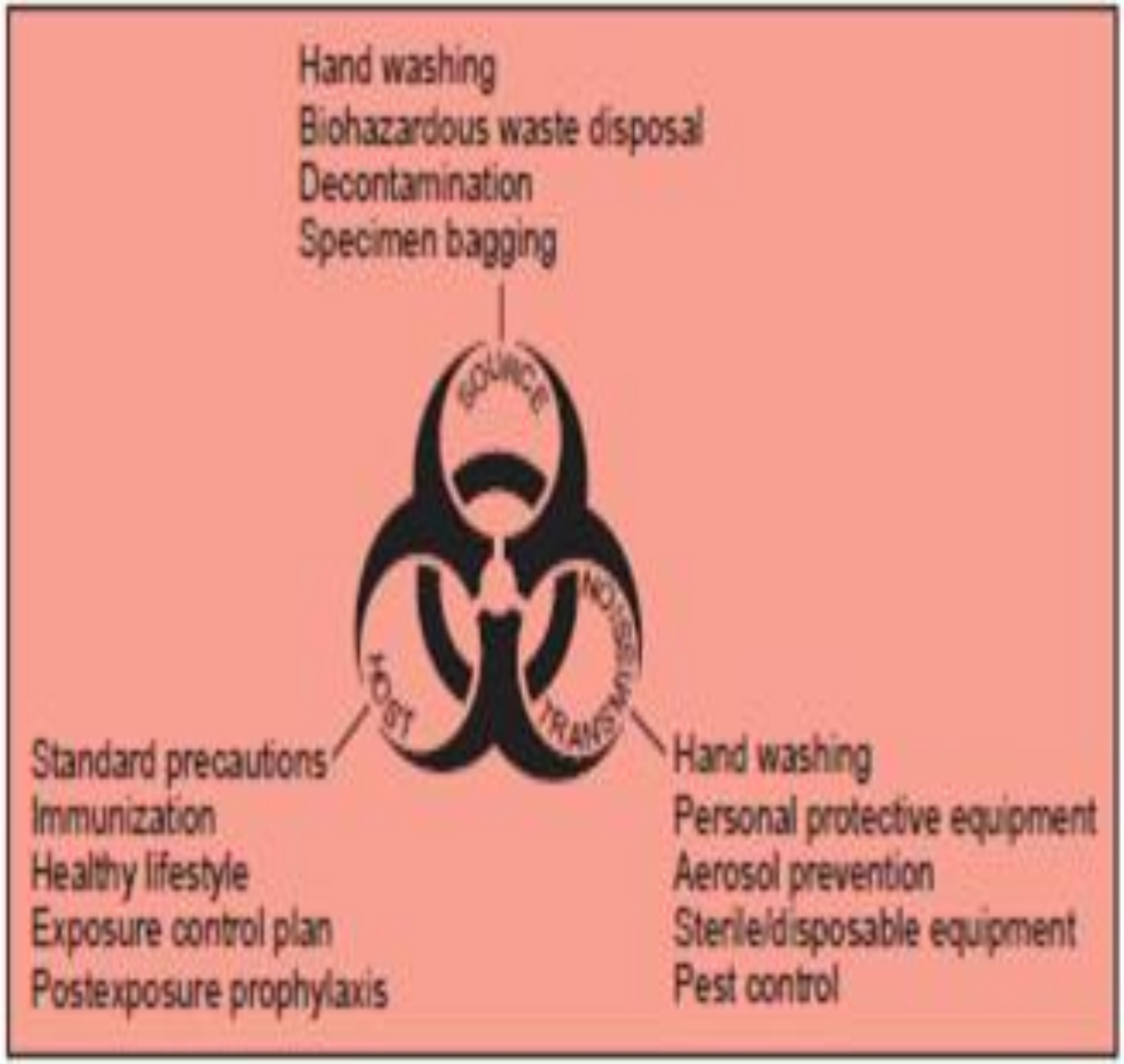
Biological Hazards

- The health-care setting provides abundant sources of potentially harmful microorganisms. These microorganisms are frequently present in the specimens.
- Understanding how microorganisms are transmitted ***(chain of infection)*** *is* essential to preventing infection.
- The chain of infection requires a continuous link between a source, a method of transmission, and a susceptible host.

Chain of infection



Chain of infection and safety precautions



Chemical Safety

- The vapors of many organic solvents are flammable or combustible. Do not expose electric sparks, open flames and heating elements to organic solvent vapors.
- Many chemicals are poisonous. Do not taste and pipette by mouth.
- Be extremely careful when transferring, distilling or refluxing volatile liquids.
- Do not return used chemicals back to the stock container.
- Do not tap flasks under vacuum.

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- Do not heat, measure or mix any chemicals in front of your face.
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- Never heat a closed system – **it will act as a bomb!**
- Never pour water into concentrated acid. Pour acid slowly into water, stirring constantly to avoid the possibility of sudden splashing caused by the rapid generation of heat in some chemical reactions because Mixing acid with water is often exothermic
- Concentrated acids and bases are stored in the fume hood.
- Make sure test tubes containing reactions are pointed away from people, especially when they are being heated.

Sharp Hazards

- Sharp objects in the laboratory, including needles, lancets, and broken glassware, present a serious biological hazard, particularly for the transmission of blood-borne pathogens.
- All sharp objects must seek medical attention.

Electrical Hazards

- The laboratory setting contains a large amount of electrical equipment with which workers have frequent contact.
- The same general rules of electrical safety observed outside the workplace apply.
- The danger of water or fluid coming in contact with equipment is greater in the laboratory setting.
- **Equipment should not be operated with wet hands**.

Physical Hazards

- Don’t make noise in laboratory.
- General precautions to consider are to avoid running in rooms and hallways, watch for wet floors, bend the knees when lifting heavy objects, keep long hair pulled back, avoid dangling jewelry, and maintain a clean, organized work area.
- Don’t touch any equipment or machinery until its need.