# TECHNIQUES IN MOLECULAR BIOLOGY – SAFETY HANDOUT

**Laboratory Safety:** Safety in the laboratory depends on the awareness and sense of responsibility of everyone involved. One of the biggest problems with lab safety is in not being prepared and therefore making simple mistakes that could have been avoided. To ensure that avoidable, accidents don't occur, there are simple safety rules and a safety checklist each student will sign.

Safety rules in the laboratory: You must take personal responsibility for safety. Rules do not make the lab safe; only people can minimize danger in the laboratory. Having stated this a few basic rules are listed below.

1. Prepare for each laboratory period by reading each exercise and becoming familiar with the principles and methods involved. By being familiar with the exercise you decrease the chances of an accident. Also, advance preparation allows you to use your time more efficiently in the laboratory to complete the experiment.

2. Do not eat or drink in the laboratory and wash hands prior to leaving the laboratory for the day.

3. Only wear closed toe shoes, wear a laboratory coat and safety glasses.

4. Wear disposable gloves while handling harmful chemicals and be aware that those same gloves are a potential source of contamination. Replace these gloves as appropriate to avoid spreading contamination. Never touch your face with your gloves

5. Wear safety goggles at all times. When required use UV protection when using a transluminator or UV lamp. Wearing contact lenses in the laboratory can be dangerous, especially if a reagent accidentally sprays into your eyes.

6. Exercise caution when using instruments such as centrifuges, electrophoresis and power supplies that have potential for serious accidents. If you are uncertain how to use these pieces of equipment, ask your instructor.

7. Carry out you experiments in the fume hood if you are using a volatile, flammable or foul smelling compound.

8. Inform your instructor immediately if an accident should occur.

9. Inform your instructor of any dangerous situation that you notice.

10. Immediately clean up any spills on bench tops, around instruments, or on the floor.

11. Clearly label samples, reagent bottles and stock solution with the chemical identity of contents, your name, date of preparations and potential hazards

12. Be aware of the toxicity of the chemicals and biological hazards of materials used in the lab. Prior to each lab your instructor will remind you of any potential problems and be sure to include any special procedures to ensure safety.

Some specifics in lab safety:

**Chemical Spills**

Small amounts of acid, base or other chemicals

- Wipe up spill with absorbent materials - dispose in designated waste containers. Rinse the area thoroughly with water followed by thorough drying.

Significant amounts (>10 mL) of concentrated acids

- Notify the instructor
- Neutralize area with base (sodium bicarbonate)
- Wipe up spill with absorbent material, pushing materials from outside to inside.
- Dispose of absorbent material in designated waste containers.
- Thoroughly rinse area with water followed by thorough drying.

Significant amounts (> 10 mL) of concentrated bases

- Notify the instructor
- Neutralize area with acid (acetic acid). Absorbent material may be added for significant spills.
- Wipe up spill with absorbent material, pushing materials from outside to inside.
- Dispose of absorbent material in designated waste containers. Thoroughly rinse area with water followed by thorough drying.

Ethidium bromide

- Notify the instructor
- Wearing gloves, wipe up the area with absorbent material, pushing materials from outside to the inside of the spill.
- Dispose of all absorbent materials in waste receptacle designated for ethidium bromide waste
- Thoroughly rinse area with water followed by thorough drying.

**Biohazard Spills**

Tissues

- Pick up solid materials and place in designated waste container
- Wipe area with absorbent material and place in designated container
- Clean area with copious amounts of water
- Use antimicrobial wash

Homogenates

- Wipe area with absorbent material and place in designated container
- Clean area with copious amounts of water
- Use antimicrobial wash

Microbial cultures

- pick up solid materials and place in biohazard waste container for bleach treatment
- wipe up the area with absorbent material which is also placed in the designated waste container
- Use antimicrobial wash

**Cleaning Glassware**

Procedure for general chemical glassware washing.

- Wash with soap and tap water.
- Thoroughly rinse the glassware at least five times.
- Rinse three to five times with distilled water.

Procedure for cleaning biochemical glassware contaminated with proteins

- Thoroughly rinse glassware with DI $H_2O$
- Place rinsed glassware in 2N $H_2SO_4$ bath overnight
- Remove from acid bath, rinse free of acid and wash dishes using procedures for typical biochemical glassware

Procedure for cleaning culture plates and tubes

- Soak materials in 20% bleach overnight, or autoclave
- Solid materials will be placed in the designated bacterial waste container.

**Transporting chemical**

- Use container-within-a-container concept for transporting materials.
- Buffers, etc. - transport in a wash basin
- Corrosives - transported in chemically resistant buckets.
- One cannot ride elevator while transporting chemicals

**Disposal of Chemical Waste** - follow all directions given by your instructors

- Halogenated organics - designated can under hood (Examples: chloroform, methylene chloride)
- Nonhalogenated organics - designated can under hood
- Alcohols - in designated containers. Stains and destain contain high percentages of methanol.
- Acids and Bases - neutralized to within pH 5 - 9 prior to disposal down designated sink.
- Buffers - most can be disposed down the designated sink. Follow your instructor's directions.
- Various toxic substances-dispose as directed by the instructor.

I, have reviewed these safety rules and will abide by them. I agree to abide by the safety instructions given to my by my laboratory instructor.

Name: _____ Date: _____