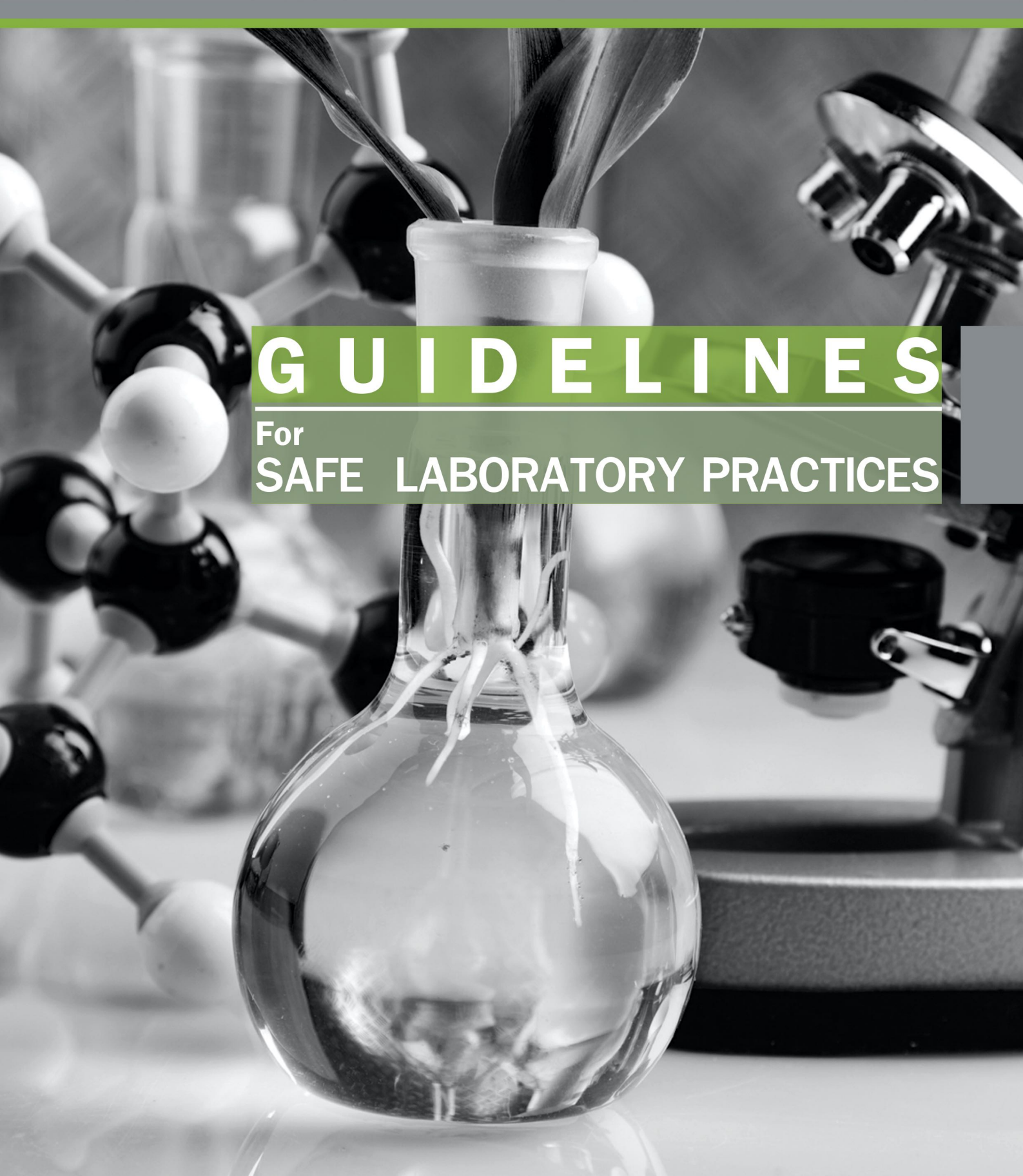




KING KHALED UNIVERSITY  
COLLEGE OF PHARMACY

# GUIDELINES

For  
SAFE LABORATORY PRACTICES





بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**In The Name of Allah,  
The Most Beneficent, The Most Merciful**



الجامعة  
الملك  
خالد

KING KHALID UNIVERSITY

KING KHALED UNIVERSITY  
COLLEGE OF PHARMACY

## GUIDELINES FOR SAFE LABORATORY PRACTICES

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# GUIDELINES

## For SAFE LABORATORY PRACTICES

### A. Introduction

The College of Pharmacy, King Khalid University is committed to provide and maintain healthy and safe working and learning environments for all faculties and students. We encourage faculty and students to take all reasonable precautions to protect the health and safety of everyone. In other words, we want to keep you and those around you safe. Laboratory operations can be dangerous whether you are working with hazardous materials or equipment or just performing common laboratory procedures.

The laboratory safety manual is intended to address the health and safety requirements of all laboratories. This laboratory safety manual has been prepared specifically for the College of Pharmacy. These safety rules are to safeguard your health and the health of the college community, and are a minimum requirement for persons working in laboratories at the college of pharmacy. These guidelines are intended to protect you and make your laboratory experience enjoyable and productive. We have included information on the use of personal protective equipment, the use and storage of chemicals, hazard communication and the proper methods of waste disposal. The lab safety guideline will provide more detailed safety information for the hazards present in the lab.

The lab safety symbols are designed in this guideline to alert laboratory personnel, staff, students, and emergency responders to the specific hazards located in individual laboratories on college. The manual also gives responders emergency contact information. It is the responsibility of each person that enters into the laboratory to understand the safety and health hazards associated with potential hazardous materials and equipment in the laboratory. It is also the individual's responsibility to practice the general safety guidelines at all times.

### B. Purpose of Manual

- To define health & safety responsibilities and accountabilities within the collage community .
- To understand the importance of safety in science .
- To know some basic lab safety rules .
- To describe a minimum level of safe practices those are expected from all individuals (faculty, staff, and students) involved in the laboratory operations .
- To provide information and standards in the form of established safety guidelines in laboratories .
- To understand the basic safety symbols .

## C. General Laboratory Protocols

(These rules apply to all College of pharmacy laboratories):

### 1. Familiarize yourself with the location of emergency exits, fire extinguishers, fire alarm pull stations and first aid kits.

- A. If the fire alarms sound when you are in lab, leave the area immediately and proceed towards the nearest emergency exit; go to the assigned assembly area and check in with your instructor.
- B. If fire starts unexpectedly in your lab, immediately contact the instructor.
  - i. If you have been trained to use an extinguisher, you may attempt to put out the fire as long as it does not place you in danger of being trapped in a burning area. Stay between the fire and the exit at all times.
  - ii. When using a fire extinguisher, aim for the base of the fire and sweep the extinguisher back and forth until the fire is out.
- C. If the room fills with smoke, drop to the floor and quickly crawl to safety. If the fire is not put out quickly, leave the area and pull an alarm station .

### 2. Smoking, eating and drinking are NOT PERMITTED under any circumstances in the laboratory or in any areas where animals are housed or examined, or biological specimens are examined.

- A. Many of the chemical reagents used in the lab are flammable, toxic and/or carcinogenic substances.
- B. Animals may be shedding zoonotic pathogens.
- C. Storage of food or drink for human consumption in laboratories or animal holding and treatment areas is not allowed.
- D. Coffee cups, water bottles, glasses or soda cans, etc., are prohibited.
- F. Contact with your mouth and eyes should be avoided. Wash your hands and leave the laboratory to adjust contact lenses or apply makeup or lip balm.

**3. Laboratory attire includes a lab coat, closed-toe shoes, safety glasses, and gloves. Wear your lab coat or other protective outerwear (as appropriate for the lab) at all times when you are in lab or handling animals. Protective outerwear will protect you and your clothing from spilled chemicals, stains, pathogens, or other destructive toxic substances.**

**A. Laboratory attire**

- i. Short pants are not permitted, due to the danger of chemical splashes on bare skin. Sandals or other open-toe footwear are not permitted, again due to the danger of spilling corrosive substances or infectious materials on bare feet and other risks associated with animal work.
- ii. Full length laboratory coats with full length sleeves are appropriate for formal Laboratories. Appropriate protective outerwear when handling animals or biological specimens may be lab coats or overalls as determined by the instructor.

**B. Safety glasses**

Wear safety glasses, goggles or other eye protection at all times when you are in the lab. Eyes are vulnerable to mechanical, infectious and chemical damage. These glasses will protect your eyes from splashes or splatters of chemicals and infectious materials, as well as many physical hazards.

**C. Nose and mouth protection**

Nose and mouth protection may also necessary. A surgical type mask is appropriate for preventing contact with the nose or mouth. You will be informed by your instructor if this is required .

**D. Gloves**

- i. Wear gloves when handling hazardous chemicals, animal secretions, excretions or other potentially infectious materials. Wear gloves when contacting potentially contaminated surfaces or equipment, and when cleaning or disinfecting surfaces or equipment.
- ii. Wear gloves for any invasive procedures such as necropsy or surgery, or when touching non-intact skin or mucous membranes.
- iii. Gloves must be removed before touching “clean” surfaces like refrigerator or incubator handles, doorknobs, and faucets. Gloves must be removed before leaving the lab work area, and should be removed inside out and placed into appropriate trash container.
- iv. Always wash your hands after removing gloves.

**E. Hair**

Students with long hair must tie it back or in some way bundle it, so that it does not interfere with work, become contaminated, or contaminate the work area.

## 4. Keep your work area clean and organized while you are working.

- A.** Clean the bench tops or other work areas before and after each lab to ensure a clean work space.
- B.** Other required cleanup of lab work areas will be explained by your instructor. Keep equipment and lab ware clean and secured when not in use.
- C.** Some instruments are delicate and must be handled carefully and properly cleaned after each use. Your instructor will demonstrate and/or instruct you regarding the proper use and care of any equipment or supplies to be used during lab exercises.
- D.** Coats, books and other items must be stored in assigned areas while laboratory activities are in progress. This is to protect these items from spills, splashes or other mishaps as well as to help maintain a tidy work space.
- E.** Some experiments may require the use of open flames. Pay close attention when using open flames in the lab.
  - i.** Be very aware of the proximity of flammable substances, and never allow them to contact the flames. Labs often will use flammable solvents.
  - ii.** Never use flammable chemicals when flames are present. Pay close attention to what items are hot. Burns can occur when students grab ring stands, beakers or other items which have been heated and not allowed to sufficiently cool. Tongs, hot pads, and other devices are available for manipulating hot items as needed.
  - iii.** Never leave an experiment unattended while it is heating. Note that alcohol flames may not be clearly visible.



## 5. Follow proper procedures for the disposal of liquid and solid wastes. Your instructor will advise you of the proper method of disposal of experimental wastes and materials for your laboratory.

**A. Paper** may be discarded into the “regular trash.” All used materials with a medical appearance and all infectious or potentially infectious wastes must be discarded into the “biohazard trash.”

### **B. Chemical waste**

- i. Some chemical wastes must be collected in specific containers for proper disposal. Your instructor will tell you when this is necessary.
- ii. Read the labels on chemical reagent bottles, medications or vaccines carefully: make sure you have the correct substance before you begin to weigh, pour, pipette or withdraw. Help keep reagents pure by not cross contaminating them with dirty instruments or needles. Scoops and spatulas should be carefully cleaned in-between each use.
- iii. Handle hazardous, volatile chemicals in a chemical fume hood.

### **C. Microbial waste**

- i. Microbial cultures are disposed by autoclaving or incineration. Hard sided waste receptacles with autoclavable bags are available in the laboratory.
- ii. Never pour bacteria or other microorganisms or hazardous chemicals down the drain or in the ordinary paper trash.

### **D. Sharps**

Sharps must be discarded in commercially available red or orange, leak-proof, rigid, puncture-resistant containers and must have the universal biohazard symbol. Ask your instructor if you are unclear if a particular item should be disposed of as a sharp.

- i. Sharps include:
  - a) Syringes removed from their original wrappers  
No matter what their purpose, never throw used syringes into the regular trash or biohazard non-sharps solid waste receptacles.
  - b) Used microscope slides.
  - c) Used glass culture tubes that have not been decontaminated.
  - d) Used hollow-bore needles or needle – syringe units.
  - e) Suture needles .
  - f) Cannulae .
  - g) Lancets .
  - h) IV tubing with needles attached .
  - i) Scalpel blades or disposable scalpels.
  - j) Vials containing modified live vaccines .
  - k) Vacutainer/blood collection tubes .

- ii. DO NOT RECAP NEEDLES BEFORE DISPOSAL into the sharps container.
- iii. Do not fill sharps containers above the manufacturer's marked line. Check the sharps container before use to ensure it is not overfilled. If the closest sharps container is full, contact your instructor for a new container.
  - a) Never attempt to retrieve any items from a sharps container.
  - b) Never attempt to press down on the sharps or shake the container to make more room in the sharps container.
- iv. Used sharps must never be carried by hand or on a tray, they must be disposed of directly and immediately into a sharps container.
- v. It is the responsibility of the person(s) using the sharp to dispose of it properly.

#### E. Waste glass (non-sharps).

Most laboratory glass not defined as a sharp can be discarded to the landfill in a hard-sided container such as a cardboard box.

- i. Broken beakers, flasks, pipettes, test tubes etc.
- ii. Empty medicine vials (except modified live vaccine vials).

#### F. Never place solid wastes of any type in the sink drains: this will clog the P-traps under the sinks.

## 6. In the event of an accident :

### Report any accident to your instructor .

#### A. Spills of Blood or other Biological Materials

- i. Notify persons nearby of the presence of a spill, so they can avoid the area.
- ii. Immediately leave the vicinity of the spill and notify the instructor. The instructor will oversee cleanup of the spill.
- iii. When cleaning up a biological spill :
  - a) Get out the spill kit (if available) and wear a pair of gloves.
  - b) Pick up any broken glass or other solid materials with the tongs or forceps.
  - c) Cover the liquid area with paper towels or other absorbent material.
  - d) Flood the area with bleach or other disinfectant.
  - e) Scrape up the absorbed spill with a dust pan; discard to the biohazard bag.
  - f) Disinfect the entire area again, wipe dry with paper towels.
  - g) Discard used paper towels and gloves to the biohazard bag.
  - h) Wash your hands with soap and warm water.
- iv. If a splash involving live cultures, blood, body fluid or secretions, or liquid chemicals get into your eyes, mouth or nose, go immediately to the eyewash station and flush for 15 minutes with running water. Notify the instructor.

**B. Animal bites**

- i. Serious zoonotic diseases may be present in pet animals, wild animals and especially non-human primates. If you are bitten by an animal, promptly wash the bite with soap and warm water, treat with antiseptic from a first aid kit, and seek medical attention if needed.
- ii. Attempt to determine the vaccination status of the animal.

**C. Chemical spills**

- i. Notify the instructor.
- ii. When cleaning up a chemical spill .
  - a) Get out the spill kit (if available) and put on a pair of gloves.
  - b) Pick up any broken glasses or other solid materials with the tongs or forceps.
  - c) Cover the liquid area with paper towels or other absorbent material.
  - d) Scrape up the absorbed spill with a dust pan; discard as instructed.
  - e) Wash your hands with soap and warm water.
- iii. If a corrosive liquid like an acid, base or solvent gets on your skin, quickly rinse the skin with copious amounts of running water and inform the instructor.

**D. Needle-stick or other sharps accidents; contact with non-intact skin**

- i. Inform the instructor.
- ii. Wash the affected area with soap and hot or warm water. Treat with antiseptic from a first aid kit.

## D. MAJOR GENERAL LABORATORY SAFETY RULES AND REASONS

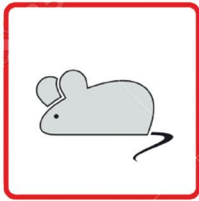
RULE	REASON(s)
Never eat or drink in the lab .	You might accidentally eat something hazardous.
Never eat or drink from laboratory glassware.	Traces of harmful chemicals could be left in the glassware.
Do not run or play roughly in the lab.	You might cause an accident by interfering with someone else or tripping yourself.
Do not play practical jokes in the lab.	You might cause an accident. For example, switching chemicals might cause a fire or explosion
Don't mix chemicals for "fun."	You might cause an accident You might produce a dangerous substance or an explosive by accident.
Avoid spilling material in the laboratory. If anything spills, call your instructor immediately. Ask the instructor about the correct procedure for cleanup.	Chemicals can pose hazards; acids can burn, incompatible chemicals may cause fires There are different procedures for different substances. Cleaning up a spill the wrong way can make things worse.
If an accident occurs, report it to your instructor promptly.	Even the most minor accident may require first aid to prevent further harm.
Keep equipment and work areas clean and organized.	Cluttered and unclean areas can result in unintentional and sometimes dangerous reactions.
Be sure all electrical connections and water taps are turned off at the end of the lab time.	Electrical equipment might short circuit Water may cause a flood, or at least a spill. It can also cause a chemical reaction.
Wear eye protection, aprons or lab coats and other safety protection as directed by your instructor or the instructions in your book.	Fragments of glass or harmful substances can damage eyes. Clothing should be protected to minimize risk of fire or burning, or other harm to clothes and skin.

## D. MAJOR GENERAL LABORATORY SAFETY RULES AND REASONS

RULE	REASON(s)
Read labels on containers with care before using their contents.	Materials with similar names or concentrations may react very differently.
Never use broken or chipped glassware. Dispose of the glassware in the proper container.	Glassware that is chipped, cracked or broken can cause cuts Glassware that is not intact may crack when heated
Learn the meaning of every safety symbol used in the lab.	Symbols will remind you of hazards and how to prevent accidents and protect yourself.
Always wash your hands after each laboratory experiment, or whenever your hands have been exposed to anything that might harm you.	It is a good habit to avoid risk of exposure to anything that may hurt your skin or damage your tissue in any way.
Read instructions for an experiment several times. Follow directions exactly. For example, add acid to water, not water to acid. If you are not sure about any part of the directions, ask your instructor for help.	Mixing some combinations of materials (including water) can cause accidents. Heating certain materials or combinations of materials can cause accidents
Never return chemicals to their original containers. Dispose of extra material you do not need according to your instructor directions.	Putting chemicals back in their original containers may cause contamination and therefore, unpredictable reactions.
Follow instructions with care about the handling and management of live animals.	The care and safety of live animals should always be of major concern.
Wash your hands after handling animals or animal cages.	Your hands may have come in contact with fecal material or other matter in the cage that may cause you harm.

E.

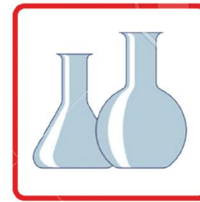
LABORATORY SAFETY SYMBOLS



Animal Hazard



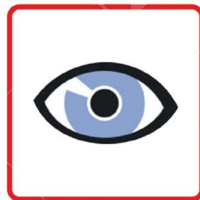
Sharp Instruments Hazard



Glasware Hazard



No open Flames



Eye & Face Hazard



Fire Hazard



Biohazard



Explosive Hazard



Toxic Chemical



Fire Extinguisher



Eyewash Station



Corrosive Materials



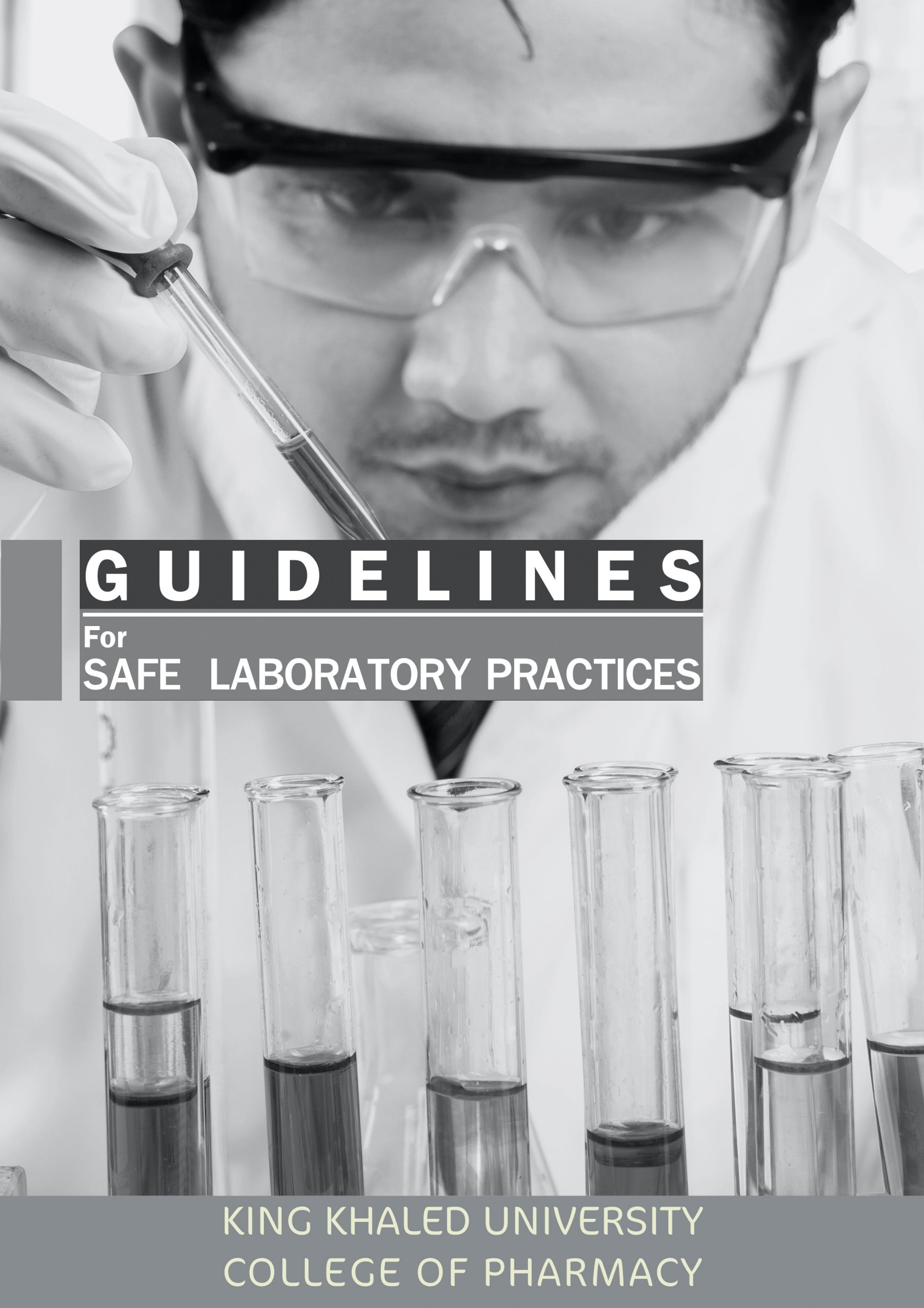
Safety Shower



**F. In case of an accident please contact****List of contact information**

Department of Occupational Safety and Health

<b>Mr. Turkey Mohammed</b> The Manager Department of Occupational Safety and Health	<b>Phone</b> <b>0172414912</b>
<b>Mr. Ali Fayz Alahmri</b> The Manager Department of Safety and University Security	<b>Phone</b> <b>0172414999</b>
<b>Mr. Ali Mohammed Alqahtani</b> The Manager Safety Administration	<b>Phone</b> <b>0172414999</b>



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