# MEDICAL MICROBIOLOGY

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**Lecture one**

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# INTRODUCTION ,LAB ,SAFETY

## Biosafety, equipment for biology laboratory

**Laboratory safety:**

**1- Lab coats: to protect you and you’re clothing from contamination.**

**2- Gloves: should be worn for handling blood and body fluids specimens**

**3- Removing the gloves after completion of work and before leaving the lab washing the hands immediately by the soap or sterilize by alcohol.**

**4- Protection the eye, nose and mouth: by face shields , masks.**

**5- avoid wearing jewelry in lab.**

**6- Never wear sandals or other open-toed shoes in the lab. Footwear should always cover the foot completely.**

7- After performing an experiment, you should always wash your hands with soap and water.

8- When using lab equipment and chemicals, be sure to keep your hands away from your body, mouth, eyes, and face.

9- Be sure to read all fire alarm and safety signs and follow the instructions.

10- Make sure you know where your lab's safety equipment—including first aid kit(s), fire, eye wash stations.

11- Know emergency phone numbers to use to call for help in case of an emergency.

12- Lab areas containing carcinogens , biohazards, and lasers should be properly marked with the appropriate warning signs.

13- Make sure you are aware of where your lab's exits and fire alarms are located.

14- Avoid eating, drinking and smoking in the laboratory.

15-Food and drink are not stored in refrigerators and freezer of laboratory.

16-Place signal on container that contain hazard materials.

17- All biohazardous materials should be place in biohazard bag to autoclave.

18- Use of biosafety hood.

19- Immunization if relevant vaccines are available.

20-Do not chew gum, drink, or eat while working in the lab.

21-If you are the last person to leave the lab, make sure to lock all the doors and turn off all ignition sources

22-If you notice any unsafe conditions in the lab, let your supervisor know as soon as possible

23-Do not pipette by mouth.

24-Never smell or taste chemicals.

25-Make sure you always follow the proper procedures for disposing lab waste.

## 2-Equipment for molecular biology laboratory:

### Deep freezer

*It is used to store cell stock culture, it is a device used to store materials when should be kept at low temperature (cell, tissues, enzyme, protein, etc.)

*This instrument is defined as freezers for -80 to -85°C and the inner volume inside are in general between 300 and 800 L.

* Uses: for long term storage for biological samples like DNA, RNA, proteins, cell extracts, or reagents. To reduce the risk of sample damage, these types of samples need extremely low temperatures as -80 to -85°C.


-40°C Freezer

## vortex

*It consists of an electric motor and attached to a cupped rubber piece.

* It used to mix sample at certain speed and duration, is a simple device used

commonly in laboratories to mix small vials of liquid.


Vortex

## pH Meter

**Biological functions are very sensitive to changes in pH**

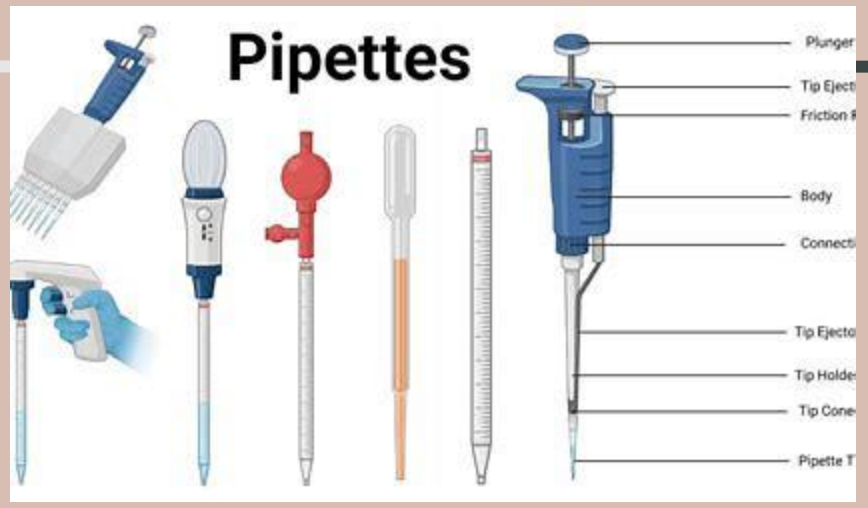
**and hence, buffers are used to stabilize the pH.**

**A pH meter is an instrument that measures the potential difference between a reference electrode and a glass electrode**

# pipette

**Is a laboratory tool commonly used in chemistry, biology and medicine to transport a measured volume of liquid.**

| Pipette type | Volumes (µL) | Tip color |
|---|---|---|
| P 10 | 0.5-10 | White |
| P20 | 2–20 | Yellow |
| P 200 | 20-200 | yellow |
| P 1000 | 100-1000 | blue |



# Micro centrifuges

Is a piece of laboratory equipment, driven by a motor, which spins liquid samples at high speed, there are various types of centrifuges, depending on the size and the sample capacity, laboratory centrifuges work by the sedimentation principle, where the centripetal acceleration is used to separate substances of greater and lesser density. devices for small tubes from 0.2 ml to 2.0 ml (micro tubes), with accelerate 30,000 g used to isolate nucleic acids such as DNA.

# Autoclave

**Equipment with high temperature, pressure and steam to sterilize the culture media and some of metal tools and glass wares.**

**The temperature = 121 C (250 F)**

**Pressure = 2 atm.(205 Kpa)**

**Time = 10 – 30 minute**

# Oven

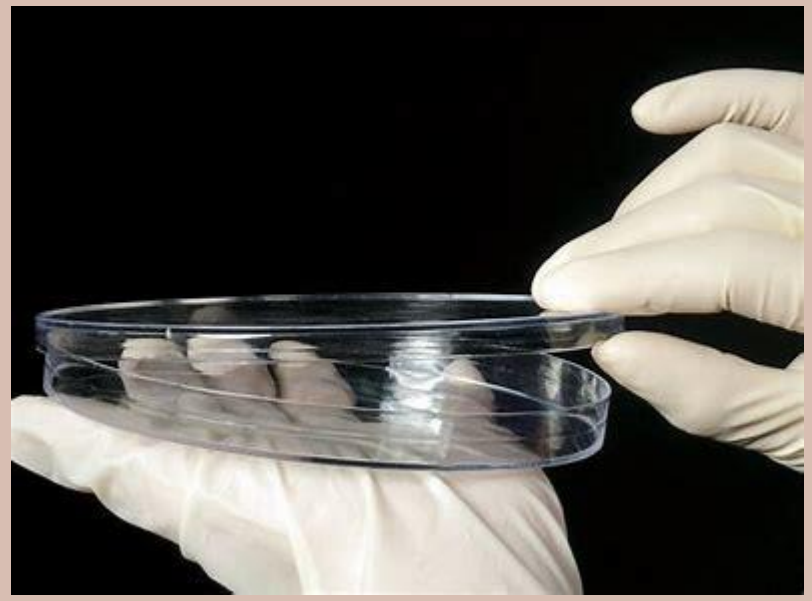
**The sterilization is (Dry heat sterilization. Used for sterilize the glass wares and some of metal tools.**

**Temp. = 180 C**

**Time=.half & hour**

**A Petri dish**

**is a shallow, cylindrical container made of glass or plastic with a lid. Biologists use it to culture cells, such as bacteria and fungi. It is the most widely used type of culture dish**



# THANK YOU