

Lab:

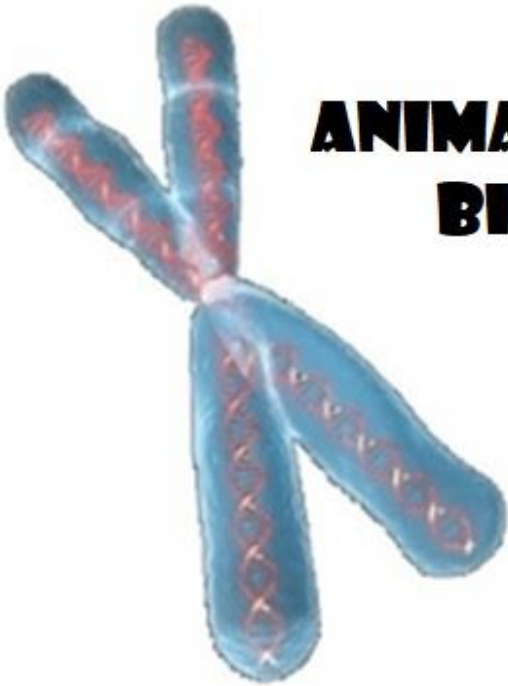
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زانكۆی سه‌لاحه‌دین - هه‌ولێر
Salahaddin University-Erbil

PRACTICAL

ANIMAL BIOTECHNOLOGY



**Subject : LABORATORY SAFETY
AND INSTRUMENTS**

Department: Animal Resources

Stage : 4

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What is safety?

Elimination of potential threats to human health

Hazard and risk:

- **Hazard** means the equipment, chemicals that have a potential to cause harm.
- **Risk** is the probability that a hazard will cause harm.

PERSONAL RESPONSIBILITY (SAFETY):

- Lab coats should be worn in the lab to protect your clothes from contamination.
- Do not eat food, drink beverages, or chew gum in the laboratory.
- Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the teacher immediately, no matter how trivial it seems. Do not be panic.
- Keep hands away from face, eyes, mouth, and body while using chemicals or lab equipment. Wash your hands with soap and water after performing all experiments.
- Eye Safety; Eye goggles should be worn:
 - When performing procedures that are likely to generate droplets/aerosols or when working with reagents under pressure.
 - When working in close proximity to ultra-violet radiation (light).

The Common Equipment Used in the Laboratory

- **Autoclave:** An autoclave is a device to sterilize equipment and supplies by subjecting them to high pressure steam at 121° C for 15 minutes.
- **Digital Balance:** is a device used to find accurate measurements of weight. The digital balances in the General Chemistry labs are very sensitive instruments used for weighing substances to the milligram (0.001 g) level.

- **Micropipettes:** The micropipette is used to transfer small amounts (≤ 1 ml) of liquids. The scales on micropipettes are in microliters ($1000 \mu\text{l} = 1$ ml).

Using a Micropipette:

1. NEVER exceed the upper or lower limits of these pipettes.
2. What size of micropipette is right for the job? Always select the SMALLEST size pipet that will handle the volume you wish to move to achieve the greatest accuracy.
3. Set the desired volume by turning the centrally located rings clockwise to increase volume or counterclockwise to decrease volume.
4. Load a sterile tip. Use blue tips for $1000\mu\text{l}$ pipettes and yellow tips for $200 \mu\text{l}$ and clear tips for $10 \mu\text{l}$.
5. Load the sample.
 - a. The plunger will stop at two different positions when it is depressed. Push the plunger down slowly to the point of first resistance: this is the load volume.
 - b. While holding the plunger at the load volume set point, put the tip into the solution so that it is immersed just enough to cover the end (3-4 mm), not as deep as possible.
 - c. Slowly release the plunger to draw up the liquid making sure to keep the tip immersed.
 - d. Visually inspect the load to make sure it is correct - there should be no air space in the distal end tip.
6. Deliver the sample. The second stopping point can be found when the plunger is depressed beyond the initial resistance until it is in contact with the body of the pipette. This second stopping point is used for the complete discharging of solutions from the plastic tip. You should not reach this second stop when drawing liquid into the pipette, only when expelling the last drop.
7. Discharge the tip.

- **Nanodrop:** is a simple, easy to use spectrophotometer for measuring DNA, RNA, and protein concentrations in small volume samples. Is a cuvette free spectrophotometer. It uses just 1 microliter to measure DNA, RNA, and protein concentrations from about 5ng/ul to 3000 ng/ul.
- **Microcentrifuges:** Centrifugation is a process that involves the use of the centrifugal force for the separation of mixtures. Precipitate called ("pellet") on the bottom of the tube, the remaining solution is properly called the "supernate" or "supernatant liquid".
- **Water baths:** is laboratory equipment made from a container filled with heated water. It is used to incubate samples in water at a constant temperature over a long period of time.
- **pH meter:** pH meter is an electrical instrument used for measuring hydrogen ion concentration solutions and mixtures.
- **PCR machines (Thermocycler) and RT- PCR**
- **UV Transilluminator**
- **Power supplies**
- **Gel Electrophoresis**
- **ELISA**