



# PRACTICAL HISTOLOGY 1 - FIRST COURSE

## LAB -1- Microscope

Sawa University

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First stage

المرحلة الاولى

محاضرة رقم 1

الجانب العملي

Lecture No. 1

Practical

تدريسي المادة : م.م هبه صاحب صادق

# OUTLINES

- 1.WHAT IS THE MICROSCOPE?
- 2.STUDY THE MICROSCOPE PARTS.
- 3.HOW CAN BE USED?
- 4.THE APPLICATIONS OF MICROSCOPE.
5. MAGNIFICATION .
6. PRINCIPLE

## Aims of lecture :-

- 1-WHY THE MICROSCOPE IS THE MOST IMPORTANT TOOL IN LAB
- 2-WHAT ARE THE TYPES OF MICROSCOPE , DEPENDING WHAT THE MICROSCOPES WERE SEPARATED TO DIFFERENT TYPES .
- 3-THE PRINCIPLE WORK OF BRIGHT FIELD MICROSCOPE

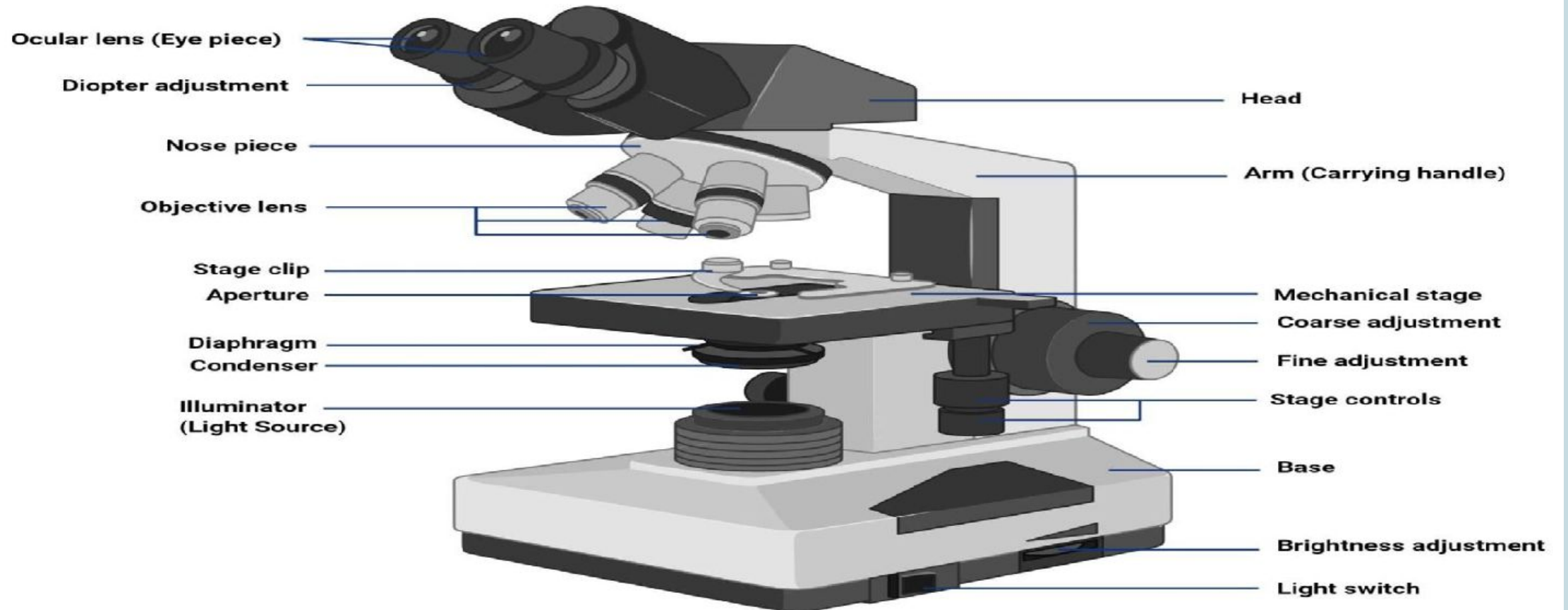
## What is the Microscope?

Microscope is an optical instrument that produces enlarged images of small objects, allowing the observer an exceedingly close view of minute structures at a scale convenient for examination and analysis. The magnifying power of a microscope is an expression of the number of times the object being examined appears to be enlarged and is a dimensionless ratio. It is usually expressed in the form  $10\times$  (for an image magnified 10 fold). Resolution is a measure of the smallest detail of the object that can

be observed. Resolution is expressed in linear units, usually micrometers.

**Study the microscope parts.**

## Microscope Parts



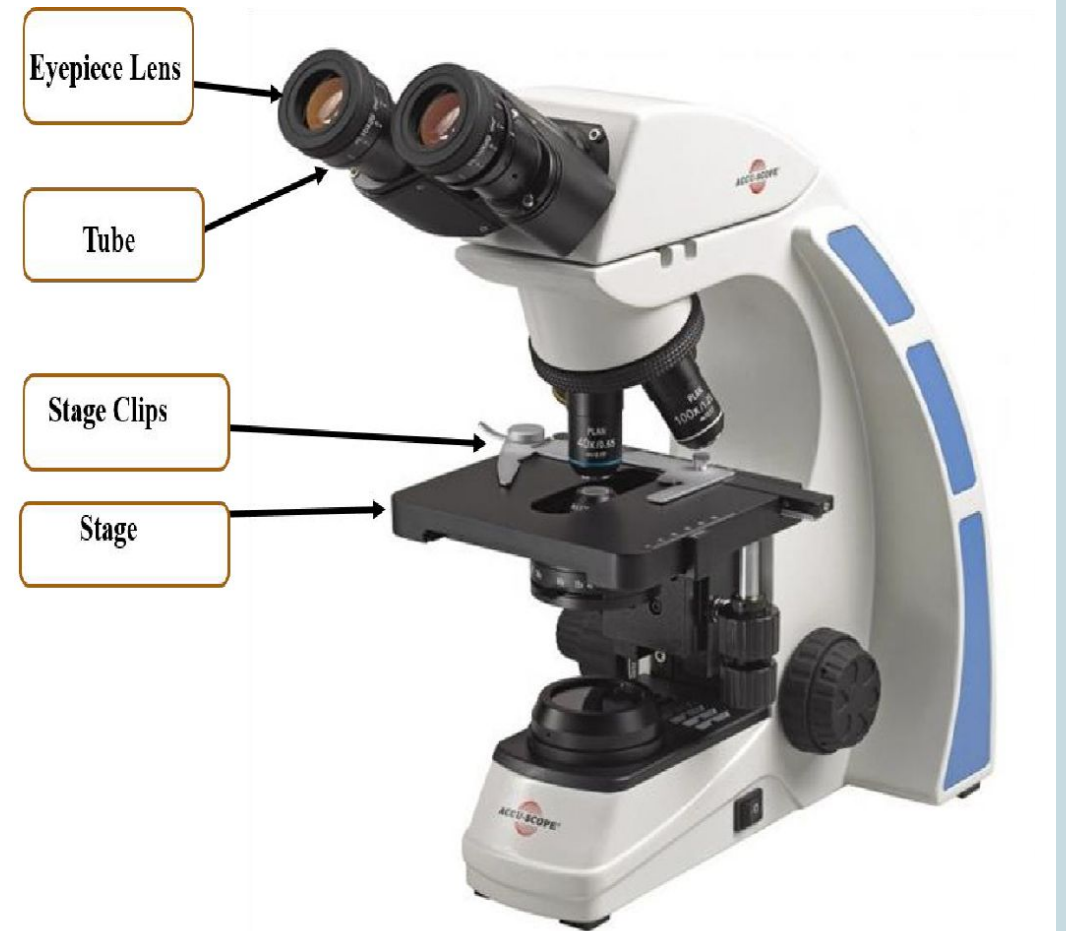
# Functions & Parts of a Microscope

**Eyepiece:** The upper lens through which you look, typically with 10x magnification.

**Tube:** Connects the eyepiece to the two objective lenses.

**Stage:** Places the object to be viewed (the specimen).

6 **Stage clamps:** Secure the slide to the stage.



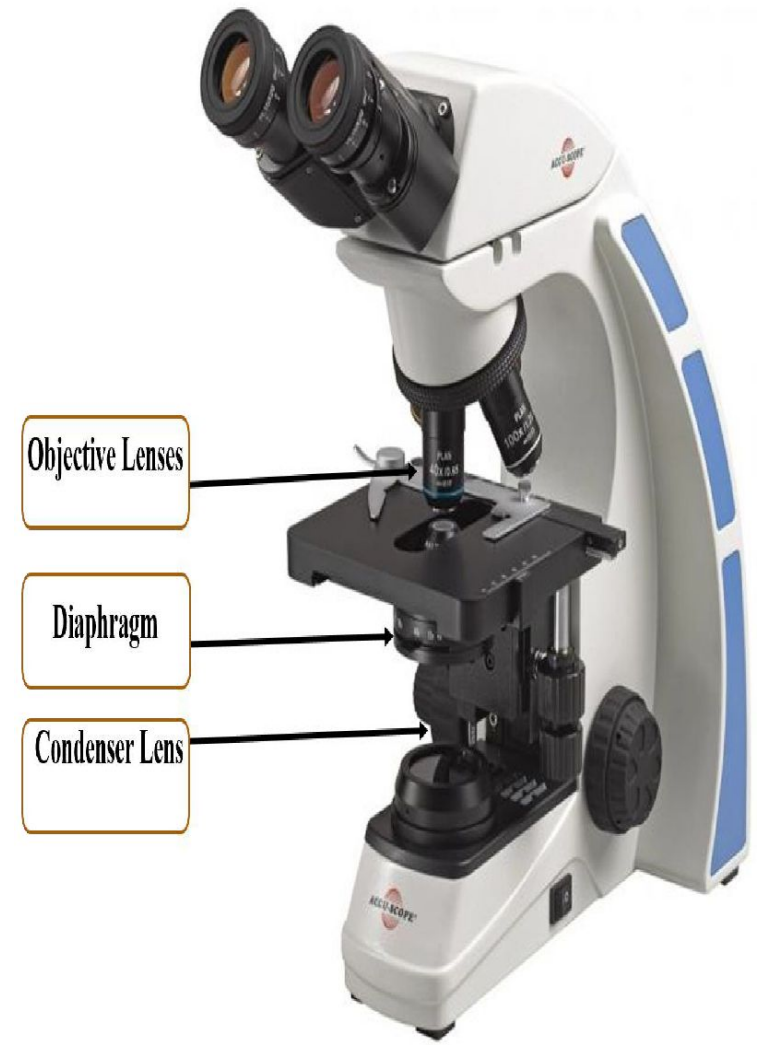
**Arm:** Supports the tube and connects it to the base.

**Base:** Beneath the microscope, used for support.

**Light source:** Located below the stage and diaphragm. It sends light toward the hole in the stage..



- **Diaphragm:** Changes the amount of light reaching the objective lenses. Located under the Stage.
- **Objective Lenses :** Usually you will find 4 objective lenses on a microscope. They almost always consist of 4x, 10x, 40x and 100x powers. When coupled with a 10x eyepiece lens, total magnification is 40x (4x times 10x), 100x , 400x and 1000x.
- **Condenser Lens:** The purpose of the condenser lens is to focus the light onto the specimen.



## How can be used?

— 1. Light passes through the specimen on the stage

2. The objective lens magnifies the image

3. The eyepiece further magnifies the image for viewing.

# The applications of microscope.

**Cell Biology** :and Life Sciences Cell Biology Used to observe the structure, shape, and behavior of cells For example, it helps in identifying different cell types, studying cell division (mitosis and meiosis), and examining the morphology of cell organelles

**Microbiology:** Essential for viewing bacteria, fungi, and protozoa It is used to identify microorganisms in clinical samples or environmental samples

**Histology:** Involves examining thin tissue sections to study the microscopic anatomy of cells and tissues It helps in understanding tissue organization and

# Shape of cell

**Histology:** is the study of cells of the body, tissues and organs as seen with a microscope, The human body like the other animals and plants is made up of units called cells.

**Cell:** is the basic structural, functional, and biological unit of all living organisms.

Main types of Cells :

1. Prokaryotic Cells

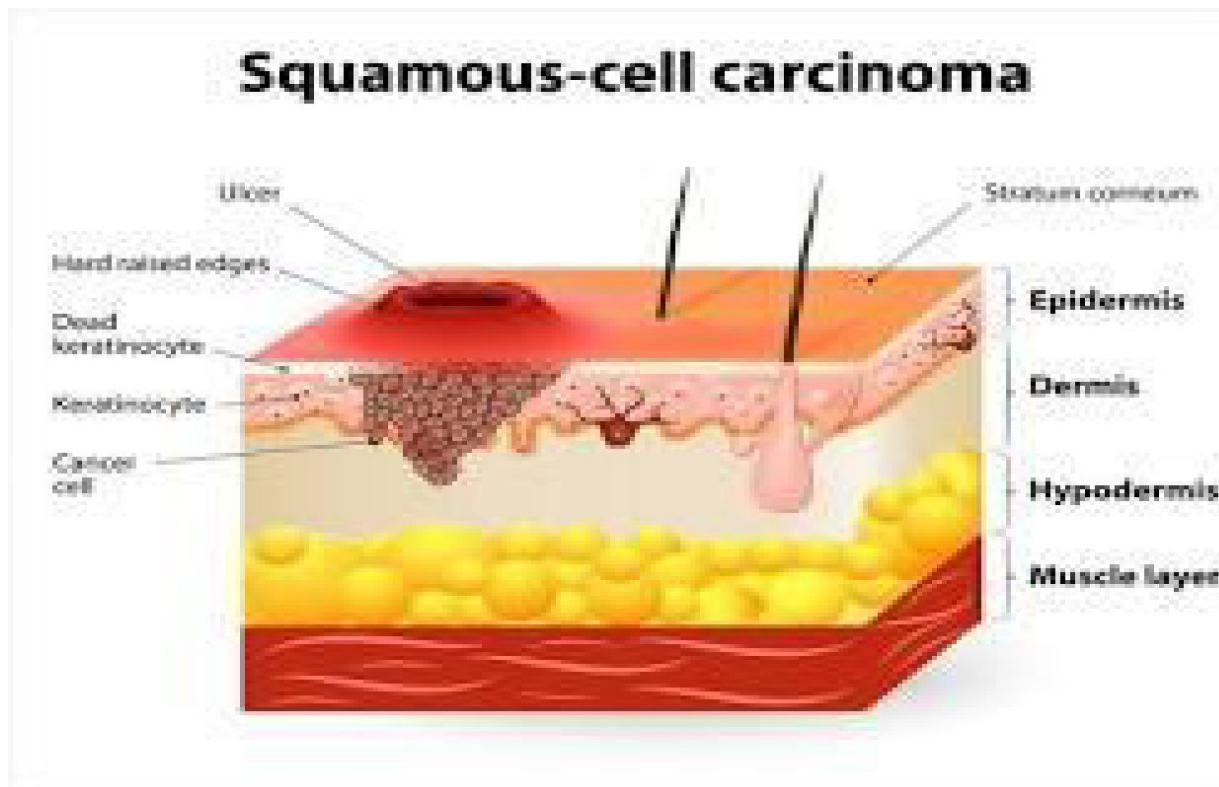
2. Eukaryotic Cells

The Fundamental Shapes, While cells exhibit a myriad of shapes, we can broadly

11 categorize them into a few fundamental types:

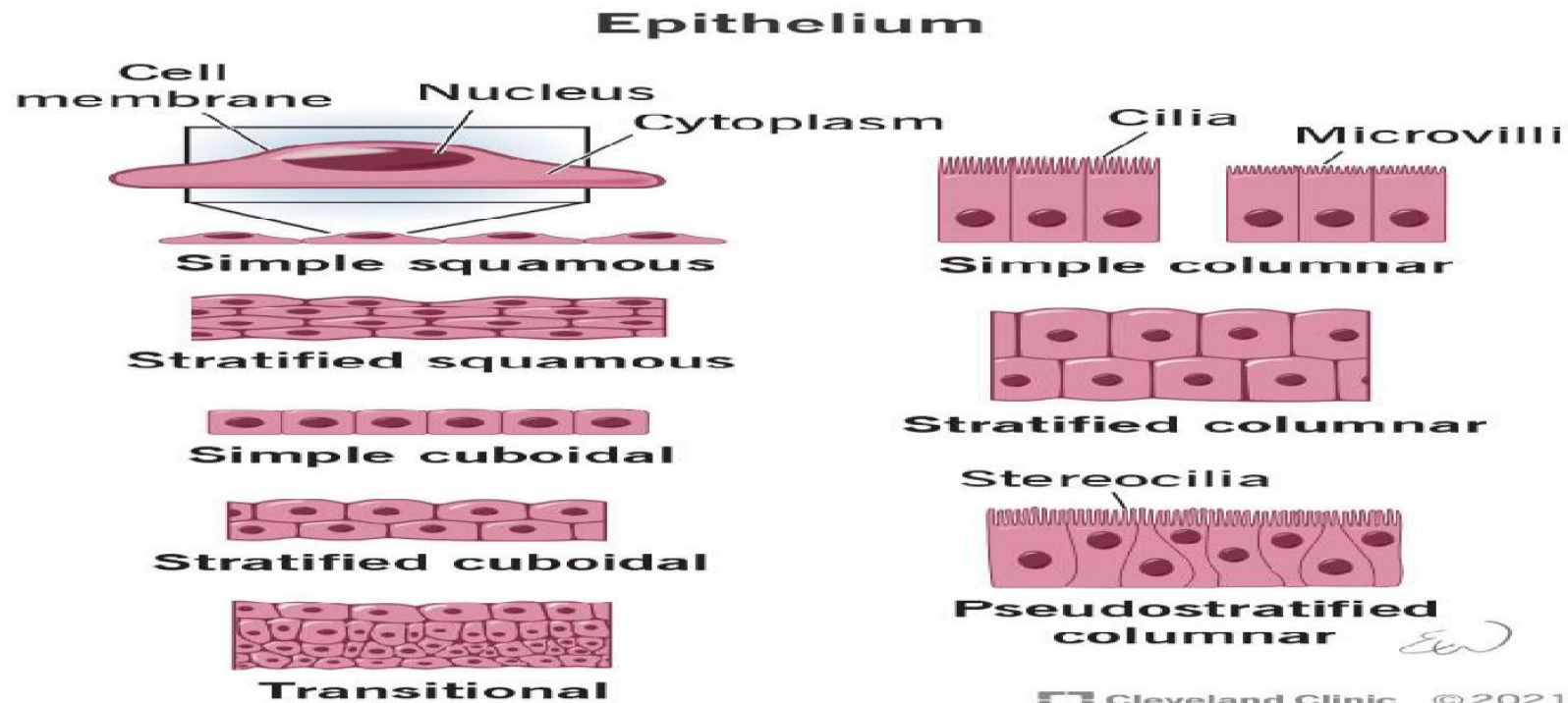
## 1. Squamous Cells:

- ✓ Description: Flattened, scale-like cells with a wide, thin cytoplasm.
- ✓ Location: Lining of blood vessels (endothelium), alveoli of lungs, and kidney tubules.



## 2. Cuboidal Cells:

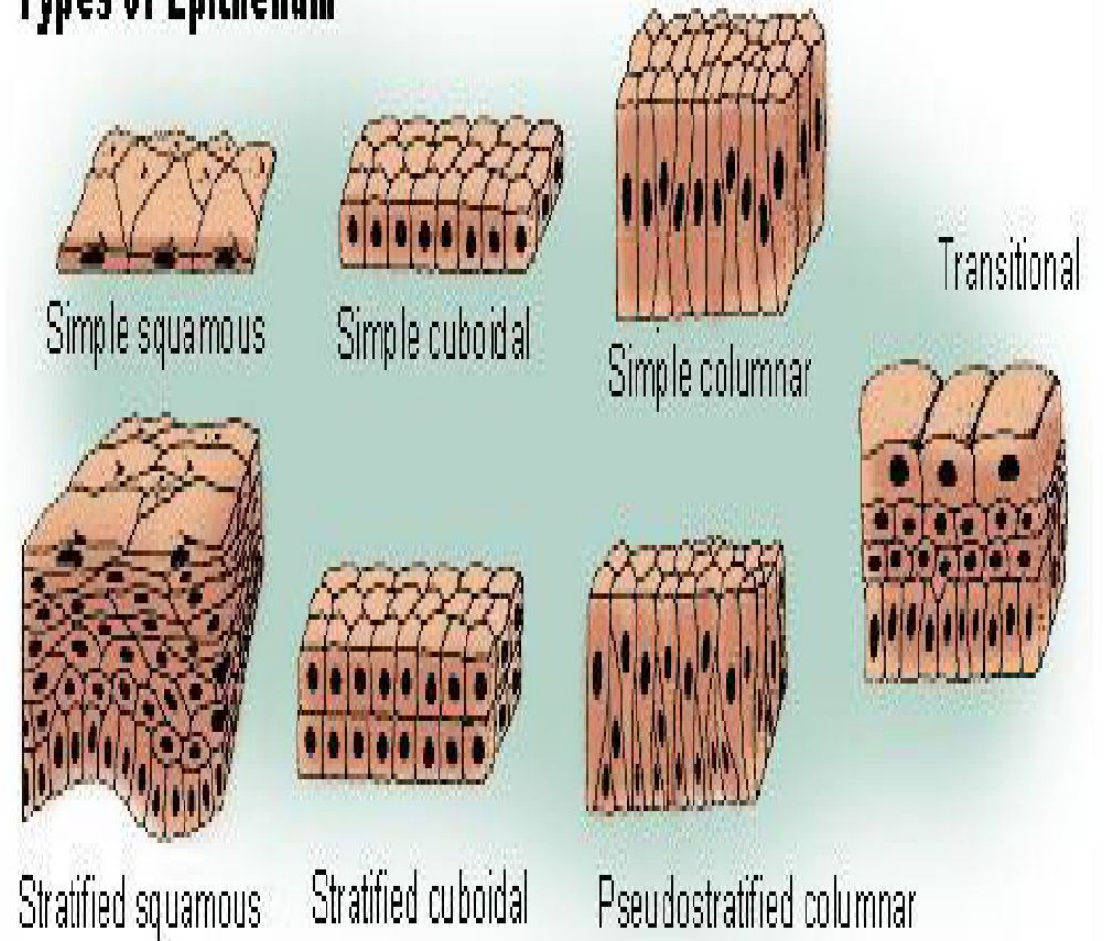
- Description: Cube-shaped cells with a roughly equal width, height, and depth.
- Location: Kidney tubules, glands, and certain types of epithelium.



### 3. Columnar Cells:

- Description: Tall, column-shaped cells with a nucleus typically located near the base.
- Location: Lining of the small intestine, stomach, and parts of the respiratory tract.

#### Types of Epithelium

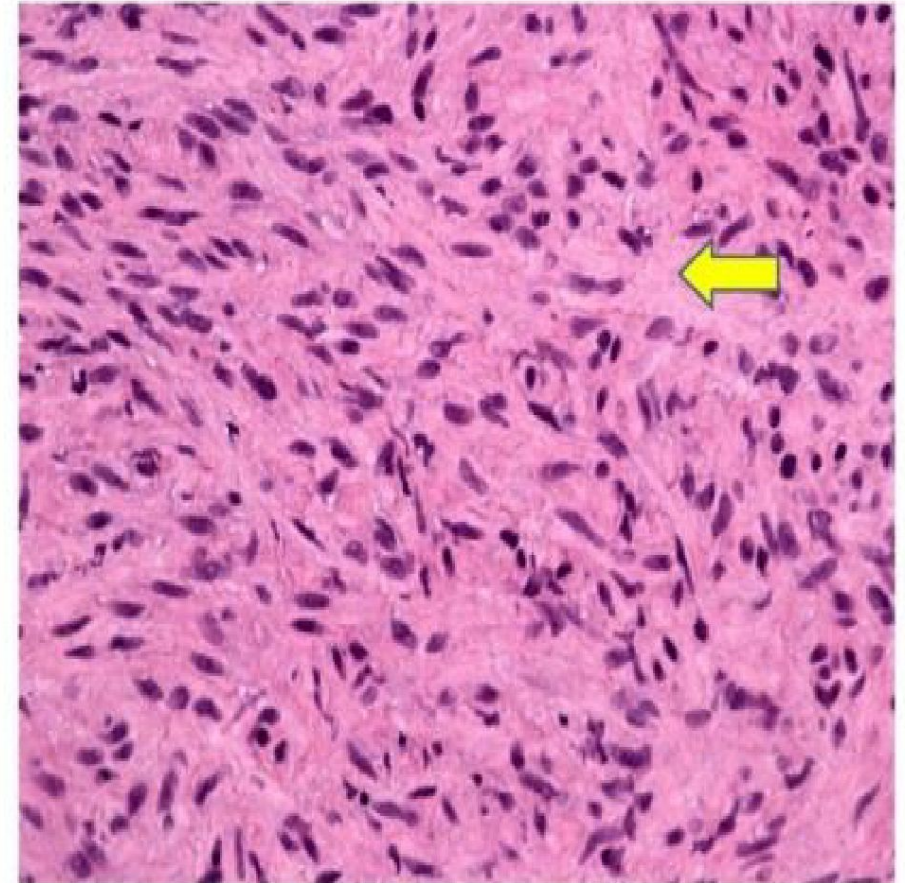


## □ Specialized Shapes

Beyond these fundamental shapes, cells can adopt more specialized forms to carry out specific functions:

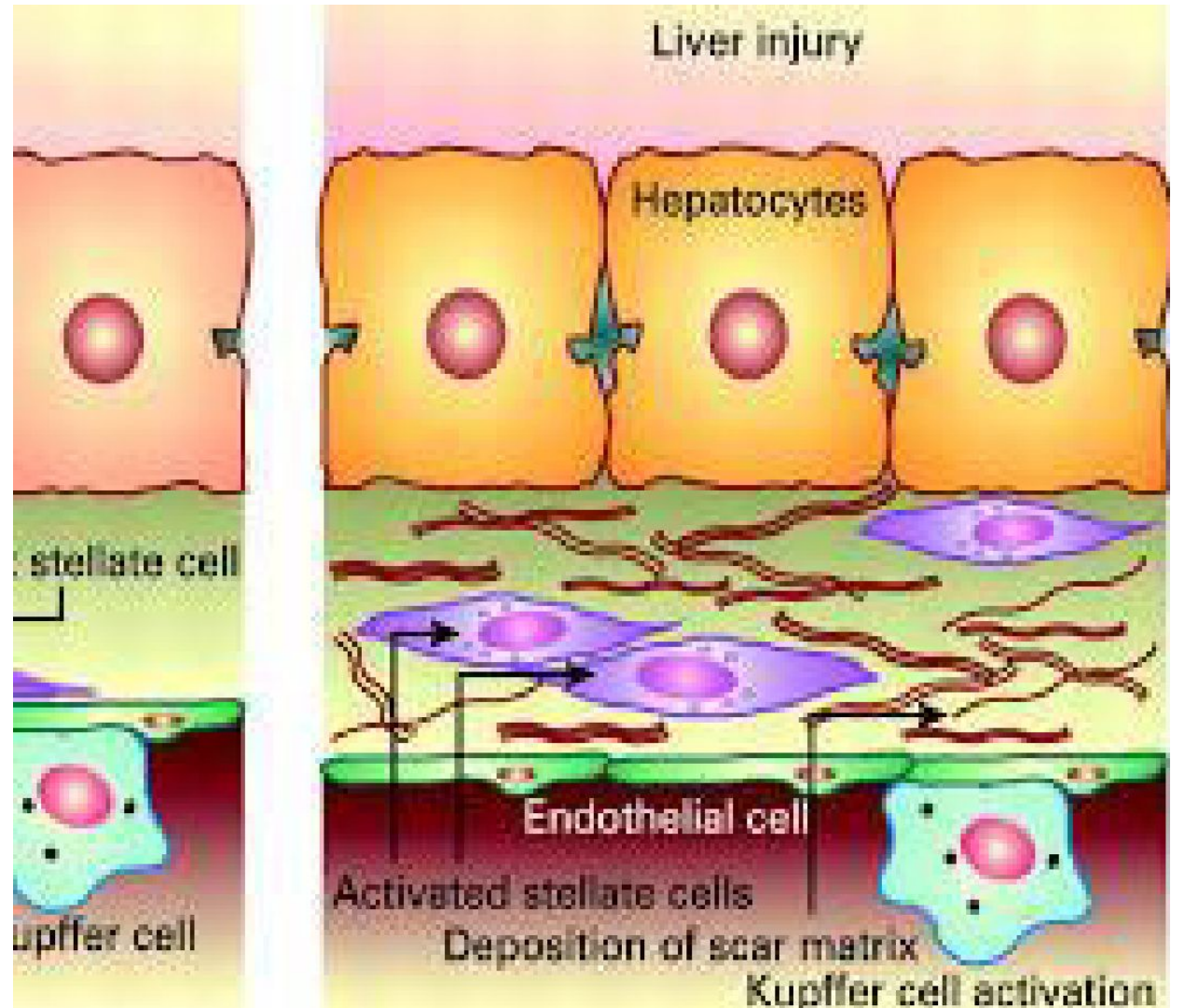
### 1. Spindle-Shaped Cells:

- Description: Elongated cells with tapered ends.
- Location: Muscle tissue.



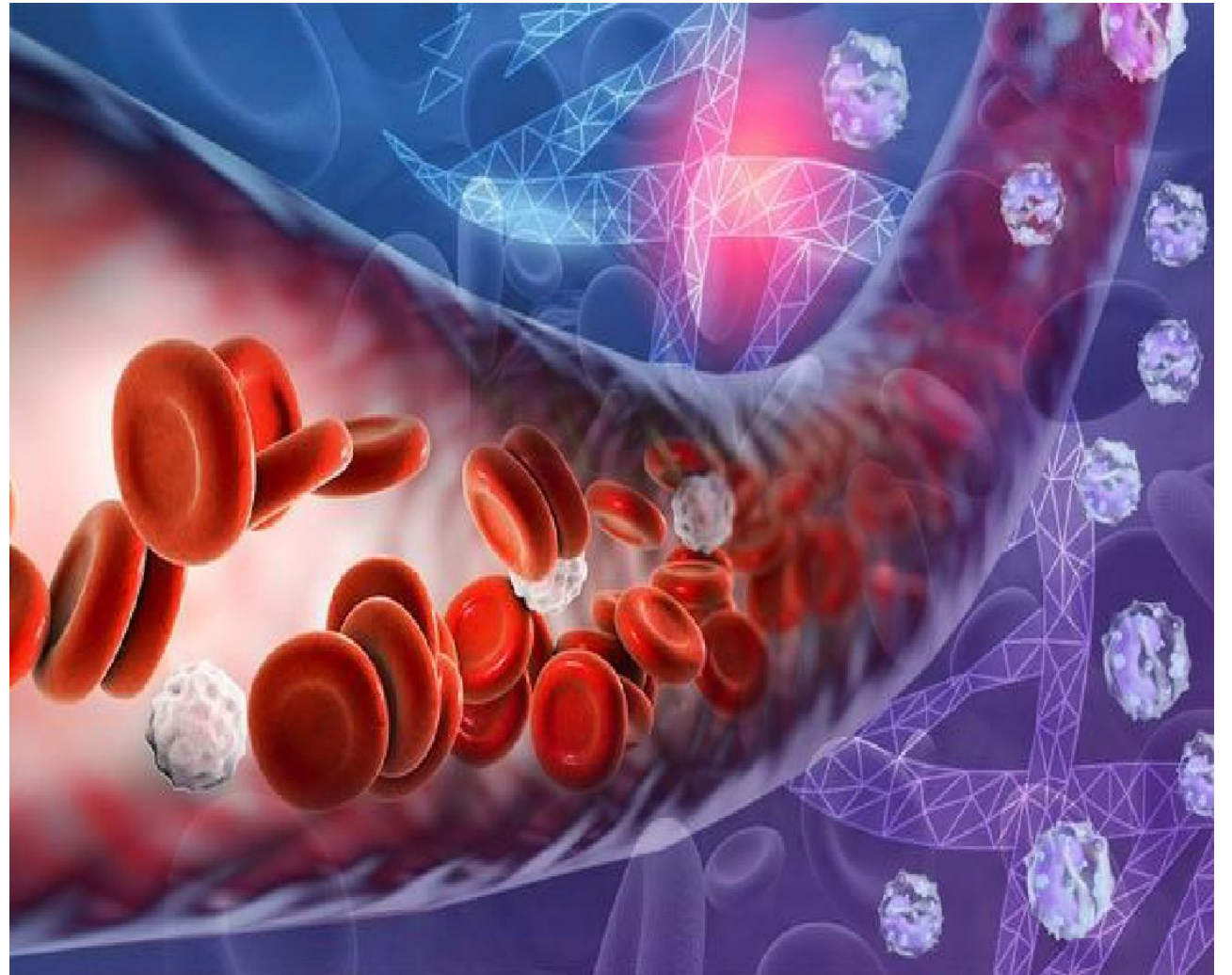
## 2. Stellate Cells:

- Description: Star-shaped cells with multiple projections.
- Location: Nervous tissue (neurons and astrocytes).



### 3. Disc-Shaped Cells:

- Description: Flattened, circular cells.
- Location: Blood (platelets)



## **Discussion :-**

1-Why do we use oil immersion with 100x ?

2-Why did bright field microscope name so ?

## **References**

- Pathologic basis of diseases, A57 edition, 2012.

**Any questions?**

*Thank  
You*