جامعة المستقبل
كلية التقنيات الصحية والطبية-قسم التخدير

Physiology Practical
Lecture: (1)
The Microscope

اعداد
م.م عمار بدري يونس
Ammar.Badri.Younes@uomus.edu.iq

General Objective

The student should be able to identify the types of microscopes, their basic components, and how to use them practically in precise examinations.

Behavioral Objectives

1. The student will enumerate the different types of microscopes.

2. The student will explain the relationship between magnification and resolution in a microscope.

3. The student will correctly use the microscope to examine an unknown sample.

4. The student will compare the optical microscope and the electron microscope in terms of their mechanisms and applications.

5. The student will evaluate the accuracy of the results obtained using the microscope.

Lecture Topics

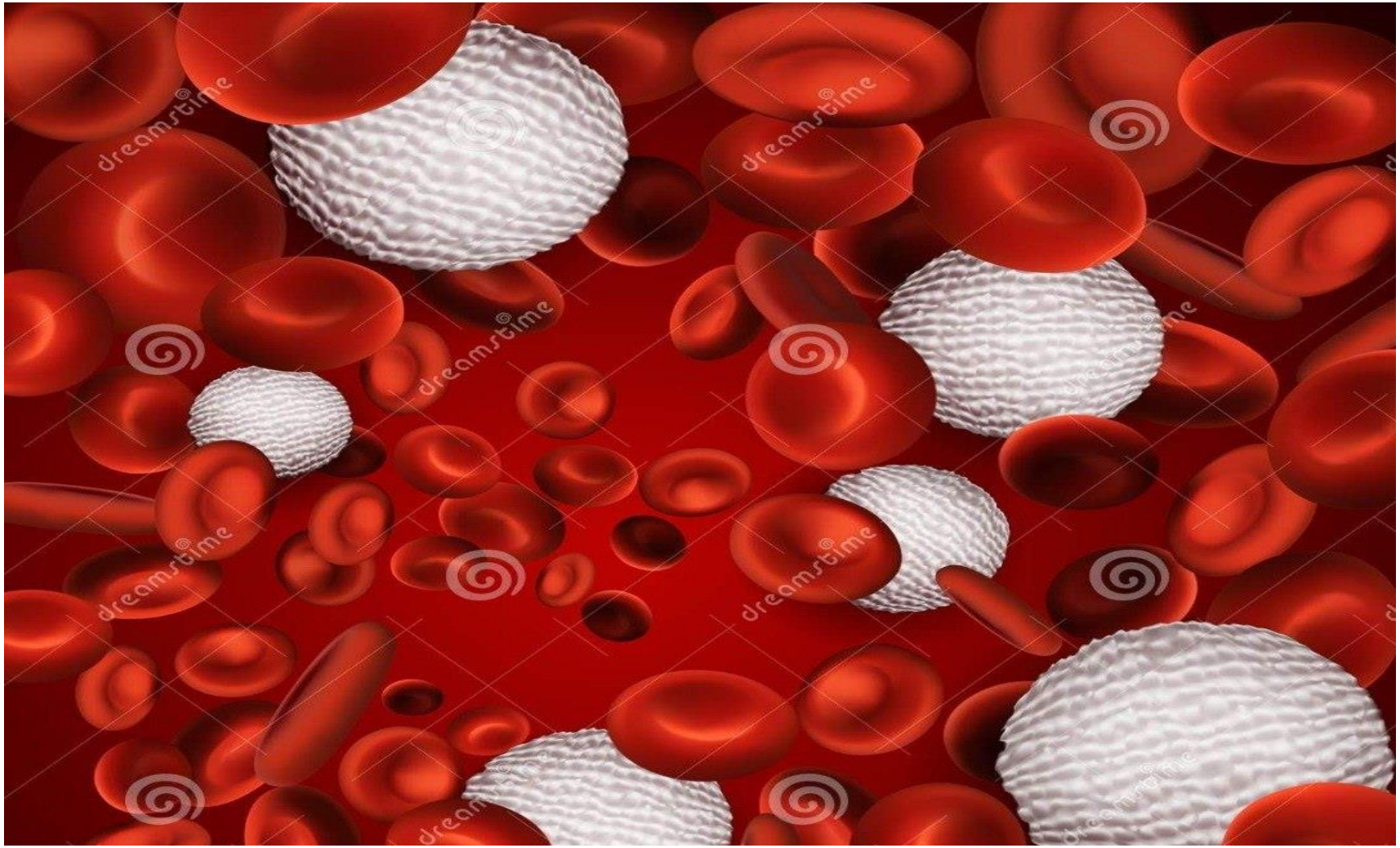
1. Definition of the Microscope and Its Importance.

2. Types of Microscopes:
   - Optical Microscopes
   - Electron Microscopes (SEM and TEM)

3. Basic Parts of the Microscope and Their Functions.

4. How to Use the Microscope Practically.

"What do you expect to see when looking at a blood sample under the optical microscope?"



Introduction

Instrument that produces enlarged images of small objects, allowing the observer an exceedingly close view of minute structures at ascale convenient for examination and analysis. The magnifying power of a microscope is anexpression of the number of times the object being examined appears to be enlarged and is a dimensionless ratio.

Total magnification = Objective magnification X ocular magnification.

It is usually expressed in the form 10×.

The resolution of a microscope is a measure of the smallest detail of the object that can be observed.

Resolution is expressed in linear units, usually micrometres(μm).

Types of microscope

1. Optical Microscopes

The most common type of microscope.

Thesemicroscopesrelyonlensesandlighttoilluminate aspecimenforoptimalimage-gathering.

They can be used for viewing living cells, insects, clinical blood and tissue assessment

2. Compound Microscopes

-A compound microscope uses a lens close to the object being viewed to collect light called theobjective lens.

-They are most often used to view objects at a cellular level and can reach magnifications up to 1000x.

3.Electron Microscopes

This type of microscope sends accelerated electrons across or through a specimen to render a digital image

Used to see detailed structure at the cellular and macromolecular levels

4. Scanning Electron Microscopes (SEM)

SEM microscopes scan the surface of a specimen in a rectangular pattern to provide information about topography and composition

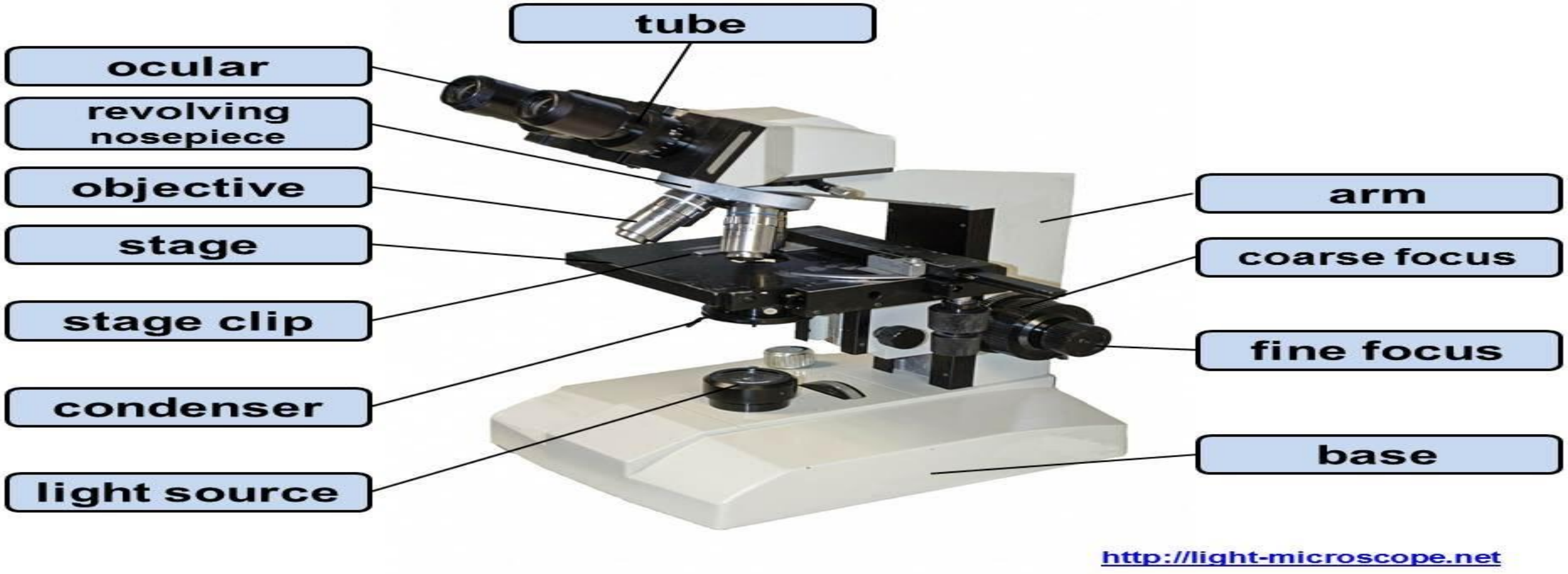
SEM also has a variety of applications Industries including microelectronics, semiconductors, medical devices and food processing, all use scanning electron microscopy as a way to examine the surface composition of components and products.

5. Transmission Electron Microscopes (TEM)

TEM must pass electrons through a thin specimen to receive information

This increased resolution allows us to study ultrastucture of organelles, viruses and macromolecules Specially prepared materials samples may also be viewed in the TEM

Parts of microscope Optical



Eyepiece(ocular):contains the ocular lens and usually has magnification power 10x.

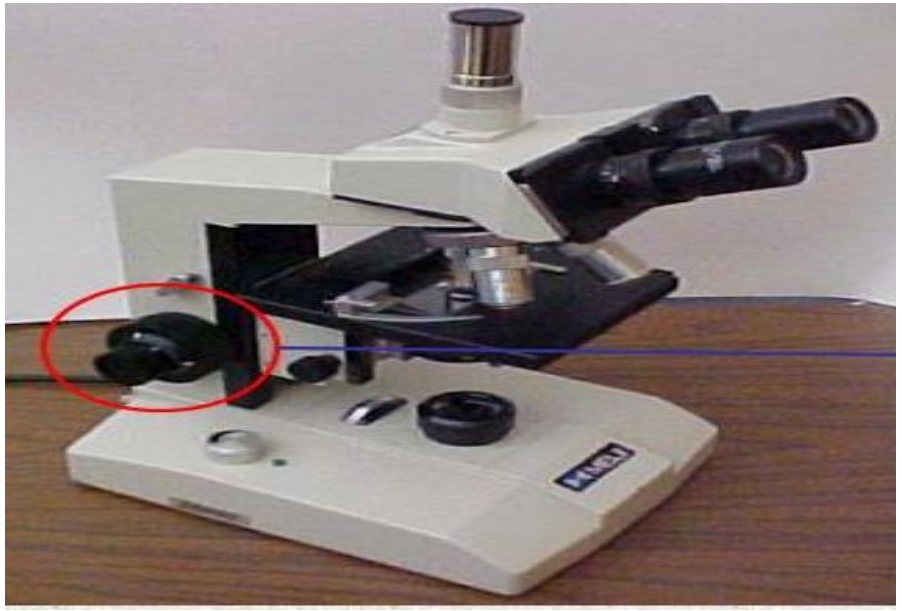
Body tube:It allows light to pass upward and through to the eyepiece.

Objective lenses The high and low power lenses,which contain several objective lenses with defferent power such as 4x,10x,40x and 100x.

Mechanical stage

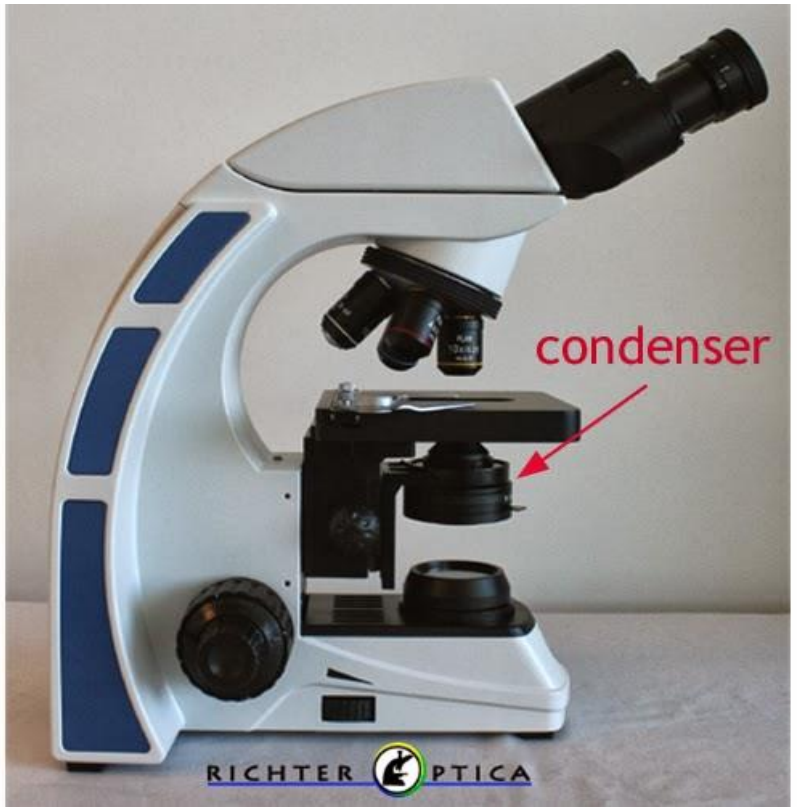
A movable part used for moving the slide

Coarse and Fine Focus



Condenser

Focus and concentrate light into a small beam and has several opening of varies sizes



Thank You!