

## Lab 3

### Microscopic type

It is a device for magnifying **small** objects that cannot be seen with the naked eye, and the science interested in exploring small objects or the fine details of things using these devices is called microscopy. The word "microscopic" or "microscopic" is used to describe something that can only be seen with the help of a microscope. The microscope is one of the most widely used devices in biology. Biologists use it to study living organisms, cells and their small parts that cannot be seen with the naked eye.

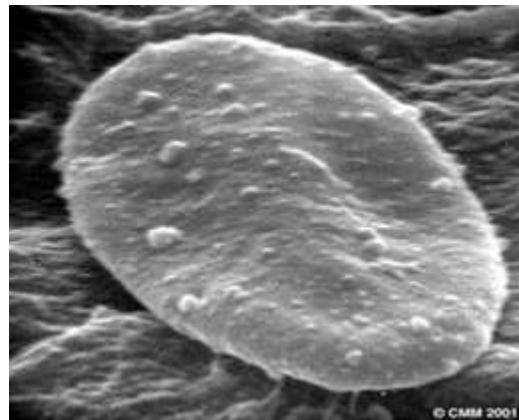
#### Types of microscopes:

الضوئي

الإلكتروني

#### Types of electron microscopes:

**Scanning electron microscope(الماسح):** This microscope works by shining a stream of **electrons** on the **outer surface** of the cell. It specializes in studying the **outer parts**, to form a three-dimensional image with a magnification of up to 50,000 times.



## Lab 3

**Transmission electron microscope (النافذ):** An electric or **electronic** current is applied to the entire cell. This type specializes in studying the **interior of the cell**.



### optical microscope:

It is a magnifying device that **depends on light** and **lenses** to magnify matter. It is characterized by its **low cost** and is most **widespread** in the fields of education and medicine. It is distinguished by its ability to monitor the activities of living cells.

### Types of optical microscopes:

**Simple light microscope** البسيط: enlarges an object with a **simple magnifying power**; Because it consists of **one double-sided lens**.



## Lab 3

**Dissecting microscope التشريري:** This device consists of **two eyepieces and objective lenses**, and its magnification power for objects ranges from 6 to 50 microns. **غير مطلوب**

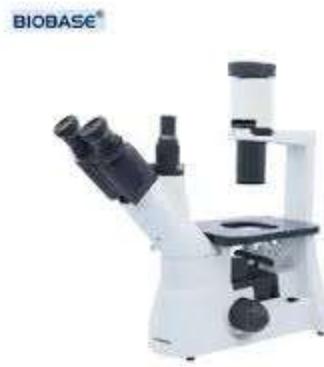


**Compound light microscope المركب:** This device **consists of a magnifying lens in the eyepiece and another in the objective lens**. Its magnification power reaches **40 to 1000 times**, and it is considered one of the most **important** devices in biology.



## Lab 3

**Inverted light microscope المقلوب:** Its design **differs** from other light microscopes in that the **objective lens** is placed at the **bottom** to magnify the sample, and the light is controlled as needed. غير مطلوب.



**Digital microscope الرقمي:** This type is characterized by the presence of an imaging camera added to it, and allows the magnified image to be displayed on the computer screen, data show, and television, and its image magnification power reaches 400 zoom. غير مطلوب.

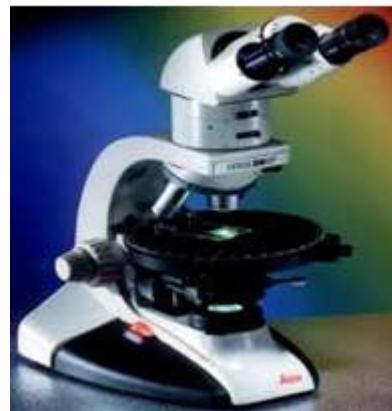


## Lab 3

**Dark field microscope** حقل المظلوم: It is characterized by the **dark floor** of the slide, and the **light is in the form of a ring** on the organism whose activity is to be observed. It is special for **examining a type of bacteria**.



**Polarizing microscope** المستقطب : It relies on the polarization of the **light** beam to distinguish between substances with double refractive power, and the most important fields in which it is **used are geology, medicine, and biology**.



## Lab 3

**Phase contrast microscope** المتبادر: This microscope has a **disc with a circular**, ring-shaped cavity, called a phase ring, as well as a phase plate, and is used to **study living, Uncontaminated cells**.



**Fluorescence or fluorescence microscopy**: It is called this because it contains on **fluorescence dye** to magnify objects, which **absorbs light** and radiates it at a **longer wavelength**. غير مطلوب



## Lab 3

A compound optical microscope consists of several parts as follows:

### First: mechanical parts      أجزاء الميكانيكية

- 1- أنبوبة جسم المجهر Body Tube
- 2- القرص الدوار Rotary disk
- 3- الذراع Arm
- 4- القاعدة Base
- 5- المسرح Stage
- 6- المنظم التقريري والدقيق Coarse & Fine Adjustment

### Second: Optical parts: الأجزاء البصرية:

- 1- المكثف Condenser
- 2- العدسة العينية Ocular Lens
- 3- العدسات الشبيئية Objective Lenses

The oil immersion lens cannot be used except by placing a drop of cedar oil or pure opalescence oil on the sample above the slide to prevent light from being refracted and scattered and to prevent it from being deflected outside the eyepiece.

## Lab 3



## Lab 3

