

# Microscopy

## Function of microscope:

1. Magnification: to magnify the object being examined.
2. Resolution: to resolve the image seen.

**Resolution:** The ability to distinguish between two points at short distances from each other.

## Microscope parts:

### 1) Eye piece (ocular):

- A. To provide further magnification of image (X10).
- B. To look at the image of object through it.

2) Eye piece distance scale: To adjust the distance between the two eye pieces.

3) Revolving Nose-piece: It holds the objective lenses.

4) Objective lenses: To produce a magnified image with different magnification. (X4, x10, x20, x40, and x100).

- ☐ X100 objective lens called: **Oil immersion objective.**
- ☐ To calculate the total magnification of the microscope:

Total mag. = objective lens mag. X ocular lens mag.

- ☐ The lowest mag. =  $4 \times 10 = X40$
- ☐ The highest mag. =  $100 \times 10 = X1000$

5) Microscope stand: To hold the microscope and connect its parts together.

6) Mechanical stage: To put the slide on it.

7) Stage control: To move the stage right and left, forward and backward.

8) Slide holder: To hold the slide and prevent it from moving.

9) Condenser: To collect the light in a cone shape from the light source to the object.

10) Condenser knob: Move the condenser up and down.

11) Iris diaphragm: Control the intensity of light that goes to the condenser.

- 12) Coarse adjustment knob: Move the stage up and down rapidly to get approximate focusing.
- 13) Fine adjustment knob: move the stage slowly to get fine focusing.
- 14) Light source.
- 15) Power switch.
- 16) Microscope base: Hold all parts of the microscope.

### **Bright field microscope:**

Used for stained slide.

Magnification= X1000

Resolution= 0.2 Mm

- ❖ **Working distance:** The distance between the objective and the object when the object is in focus.
- ❖ **Par focal:** When move from one objective lens to another you are still in approximate focusing.

### **Other types of light microscope:**

#### **Dark field microscope:**

The condenser condenses the light on the object or specimen but out of the objective. The result is dark background and bright object.

-Used: to see the motility of bacteria.

#### **Phase contrast microscope:**

Produce contrast between the cell and the background.

The cells appear darker against a brighter background.

-Used: in examination of wet preparation.

#### **Inverted microscope:**

The condenser is above the stage while the objectives below the stage.

-Used: to see the effect of virus on the cells (cell culture flasks).

**Dissecting microscope:**

It is a simple microscope.

-Used: in mycology to see the plate of fungi + dissecting of insect.

**Non-light microscope:****Fluorescent microscope:**

Produce ultra violet light.

The slides stained with fluorochrome.

- Used: in immunology.

**Electron microscope (E.M):**

Produce electrons (electron beam).

Magnification= X100 000- X300 000

Resolution= 0.0003 Mm

-Used: to see viruses and the cell ingredients.