

MICROSCOPY

(Greek: micron = small and scopes = view)

A microscope is an instrument for viewing objects that are too small to be seen by the naked or unaided eye.

The science of investigating small objects using such an instrument is called Microscopy.

• History: → Zaccharias Janssen and his son Hans two dutch spectacle makers (1590s) discovered that nearby objects appeared greatly enlarged while experimenting with several lenses in a tube.

Antony van Leeuwenhoek (1632-1723) thought on it and finally discovered the microscope.

• TYPES :-

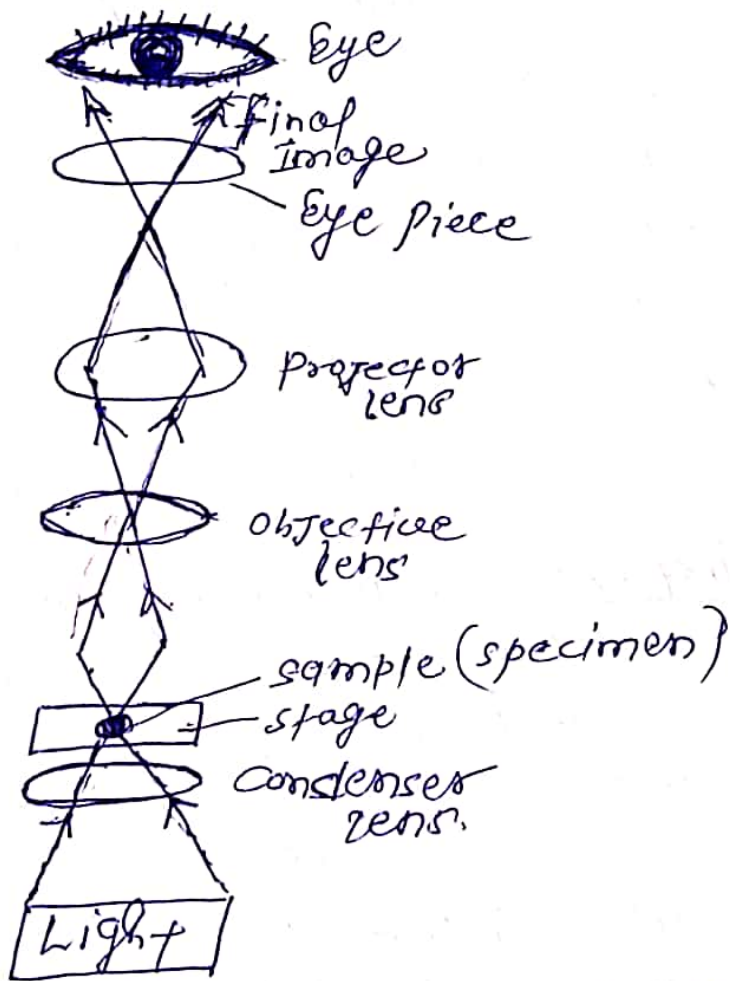
There are so many type of Microscope these are following -

- ① Light Microscope { simple
compound
- ② Electron microscope { Scanning electron
microscope
(SEM)
- ③ Phase Contrast Microscope { Transmission electron
microscope
(TEM)
- ④ Dark field Microscope
- ⑤ Fluorescence microscopy
- ⑥ Interference microscopy

① Light Microscope :- →

• This is the simplest & most widely used microscopy.
• In this specimens are illuminated with light that is focussed using glass lenses and viewed using the eye.

• specimen can be living or dead. but they need to be stained with a colored dye for proper visualising. Diff stains are used for ^{various} ~~various~~ cells like animal like DNA, Lipid, cytoskeleton etc.



Immersion oil has same n as glass.
 The condenser lens also provides the resolving power of the microscope.

Fig- Light traveling through the Compound Microscope

- All Light Microscopes ^{today} are compound microscopes and they use several lenses to obtain high magnification.
- Light microscope has ^{about} 200 nm resolution which is good for viewing cell but not cell organelles. Fluorescence Microscopy has resolution 10 nm while Interference microscopy has a resolution of 1 nm these are used recently to improve resolution.
- Magnification depends on ocular (10x) lens and objective lens (4 diff lenses) magnification.
- Light bends when it passes from glass to air or from air to glass (due to diff refractive index). bending of light passes through the glass to the air and then to the glass lens decreases the resolving power. At high magnification (1000x) it can prevent a clear image from being viewed. This ↓ in resolution can be prevented by using Immersion oil betⁿ the slide & lens.