

Microbiology I

Lab1 :- The Microscope

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Lab/1 :- The Microscope:-

Micro: small, Scope: view, It magnifies the image of the object to be visualized through it. The resolving power of the light microscope under ideal conditions is about half the wavelength of the light being used. (Resolving power is the distance that must separate two point sources of light if they are to be seen as two distinct images.).

Types of the Microscope

- 1-Light Microscope
- 2-Bright field Microscope
- 3-Dark field the Microscope
- 4-Ultraviolet Microscope
- 5-Fluorescent Microscope
- 6-Phase contrast Microscope
- 7-Electron Microscope

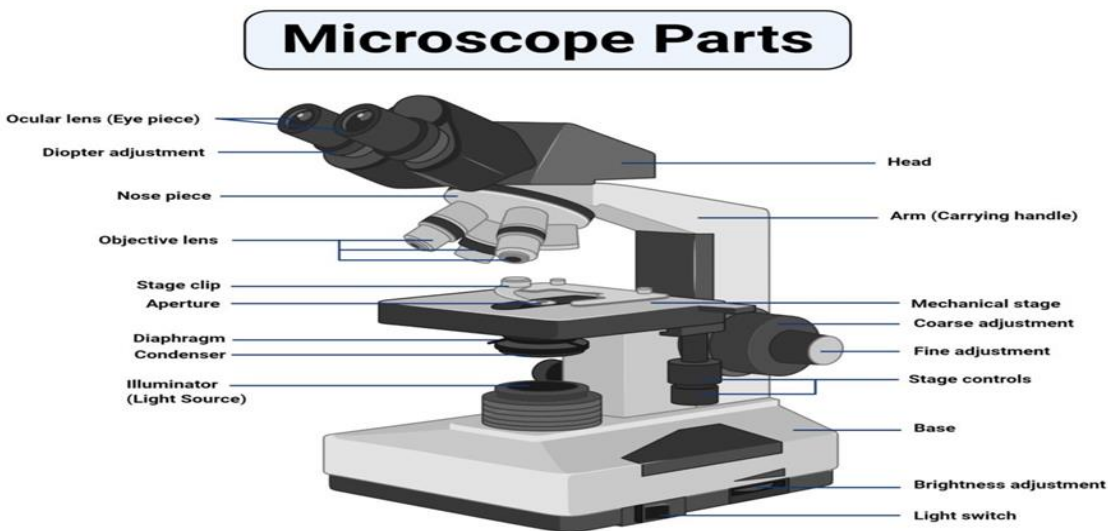


Figure: Parts of a microscope, Image Copyright © Sagar Aryal, www.microbenotes.com

Conformation of compound microscope:-

Oculars

The oculars have lenses that magnify images 10 times (10x). Inside the right ocular is a pointer which can be moved by rotating the ocular. The right ocular is loose, while the left ocular is secured in place. This is for Köhler illumination. The oculars sit in the ocular tubes.

Diopter Adjustment Ring

This ring is used to accommodate the fact that both of your eyes may not be focused the same. Instructions on how to use this part are given below. This ring is found on both ocular tubes

Ocular Tube The ocular tubes hold the oculars, and can be adjusted for interpupillary distance, the distance between your eyes.

Head

This part of the microscope contains a delicate prism system which helps to send an image to the oculars and your eyes.

Body

This part of the microscope houses the revolving nosepiece or Turret and objective lenses.

Revolving Nosepiece or Turret

This part of the microscope contains four objectives at various magnifications.

Objective Lenses

These lenses have different magnification power and divided to two types:-

1. Low power objective lenses (LP): 4X and 10X
2. High power objective lenses (HP):
40X (dry) and 100X (oil immersion).

Arm

This part of the microscope essentially holds all of the other parts, and is used in the transport of the microscope.

Course Focus Knob

This knob located on both sides of the microscope allows you to focus your image in the microscope.

Fine Focus Knob

This knob "fine tunes" the focus of your specimen.

Base

This part of the microscope holds everything in place, and is used in the transport of the microscope.

Mechanical Stage

This is where the specimen is placed for observation. The slide holder has a clamp which can swing out to hold the slide. The lever which opens the clamp is on the left side of the microscope. With a slide in place, it can be moved in the X and Y directions using the stage control knobs.

X Stage Control Knob

This knob will move a slide in the X-axis (horizontally) on the mechanical stage.

Y Stage Control Knob

This knob will move a slide in the Y-axis (vertically) on the mechanical stage.

Condenser System

This is a system of lenses which helps to focus light directly on the specimen that is mounted on a slide.

Diaphragm Lever :-This lever is used to control the diameter of the diaphragm.

Condenser Focus Knob

This knob is used to focus light properly on the mounted specimen.

Field Iris Diaphragm

This system is used to vary the diameter of the field iris diaphragm, limiting the amount of light passing through the condenser system and the specimen.

Brightness Control Knob/Power Switch

This knob controls the brightness of the light, and also acts as the ON/OFF switch.

Illuminator

Housing a 6 V 20 W halogen bulb within the base of the microscope, this system provides light for specimen illumination.

Power Cord

Supplies power to the microscope illumination system.

Magnification:-

Magnification power of microscope = Magnification power of objective lenses x

Magnification power of ocular lenses

For example:- the oil immersion have 100x and the ocular =10 , the magnification of microscope

=100x10=1000x.