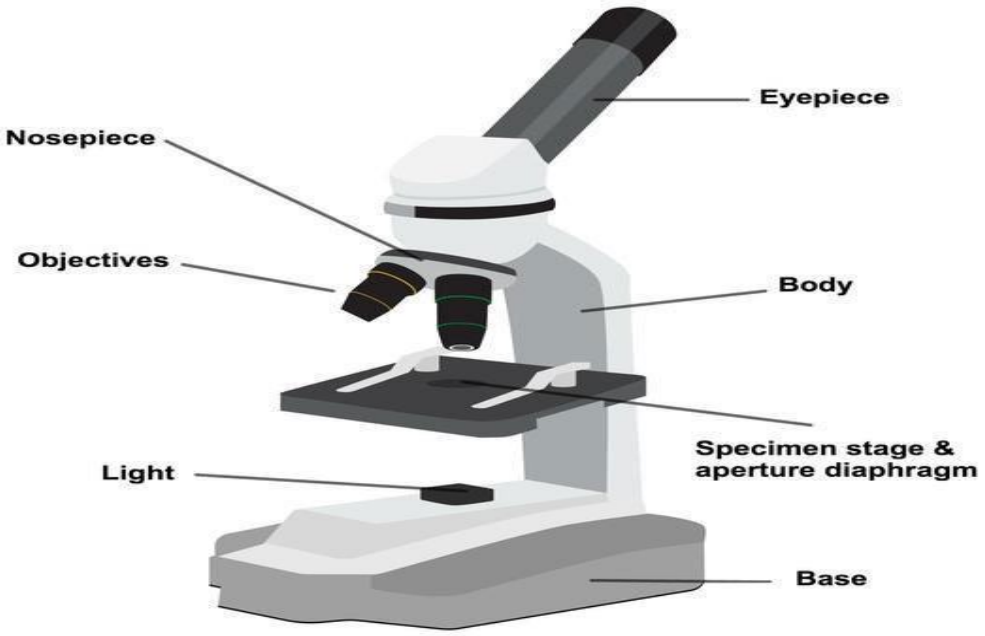
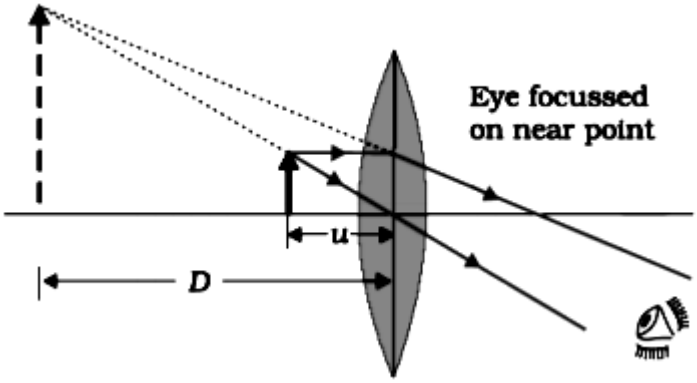


Simple microscope.

Ray diagram of simple microscope:



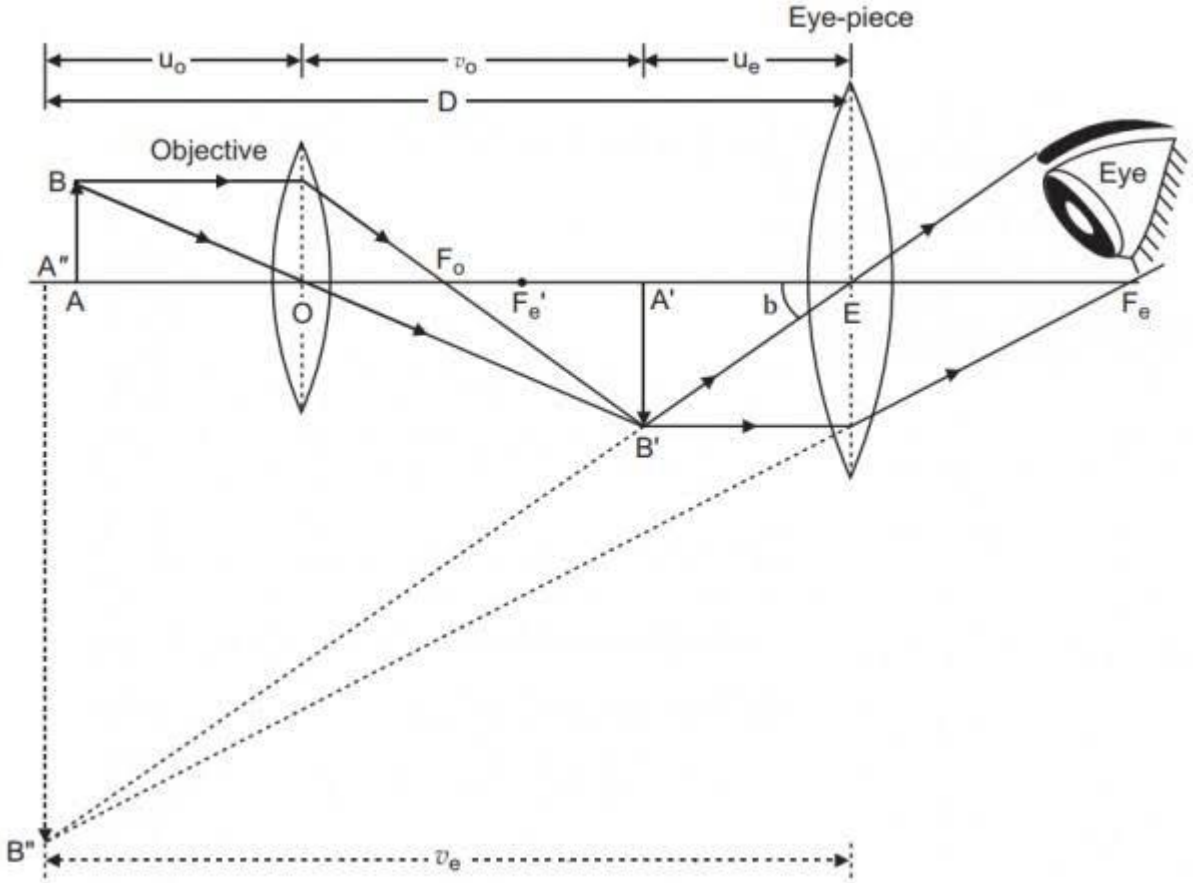
A simple microscope is essentially a magnifying glass made of a single convex lens with a short focal length, which magnifies the object through angular magnification, thus producing an erect virtual image of the object near the lens. A simple microscope is used to see the magnified image of an object. Antonie Van Leeuwenhoek, a Dutch, invented the first simple microscope, consisting of a small single high powered converging lens to inspect the small

micro-organisms of freshwater. It is chiefly designed from the light microscope.

Function: A simple microscope is used to see the magnified image of an object. Antonie Van Leeuwenhoek, a Dutch, invented the first simple microscope, consisting of a small single high powered converging lens to inspect the small micro-organisms of freshwater. It is chiefly designed from the light microscope.

Compound Microscope.

Raydiagram of compound microscope:


Eye-piece
u_o
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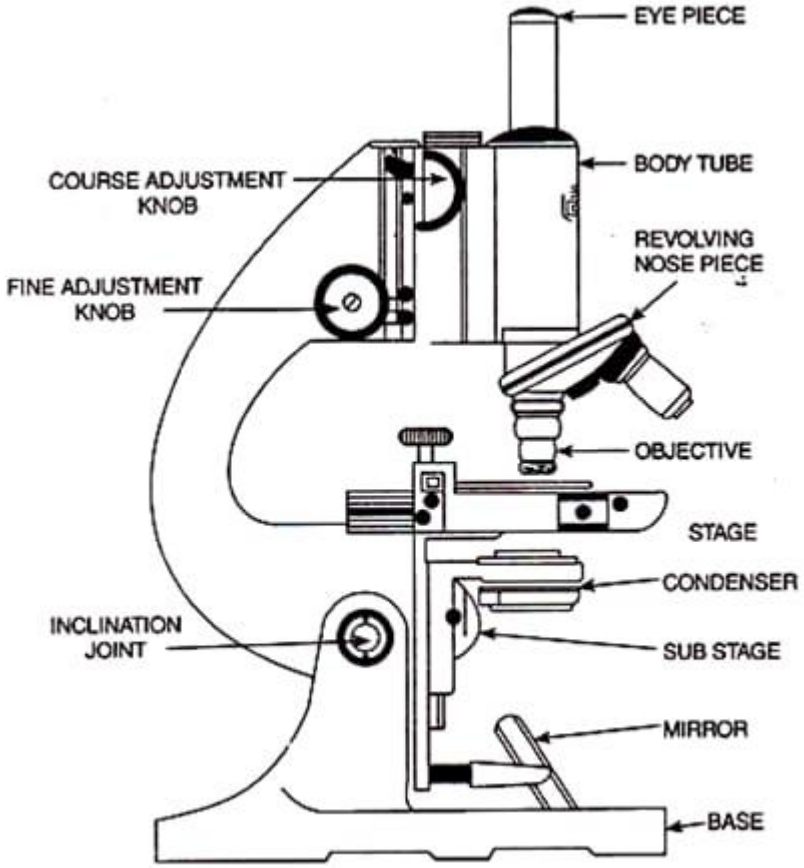

FIG. 15.1. The compound microscope showing its various parts.

A compound microscope is an upright microscope that uses two sets of lenses (a compound lens system) to obtain higher magnification than a stereo microscope.

What is Compound microscope of class g?

A compound microscope is a type of microscope that uses two sets of lenses to magnify the image under the microscope. It has an objective lens that has a resolution of 4x,10x, 40x, 100x, and an eyepiece of resolution of 10x..

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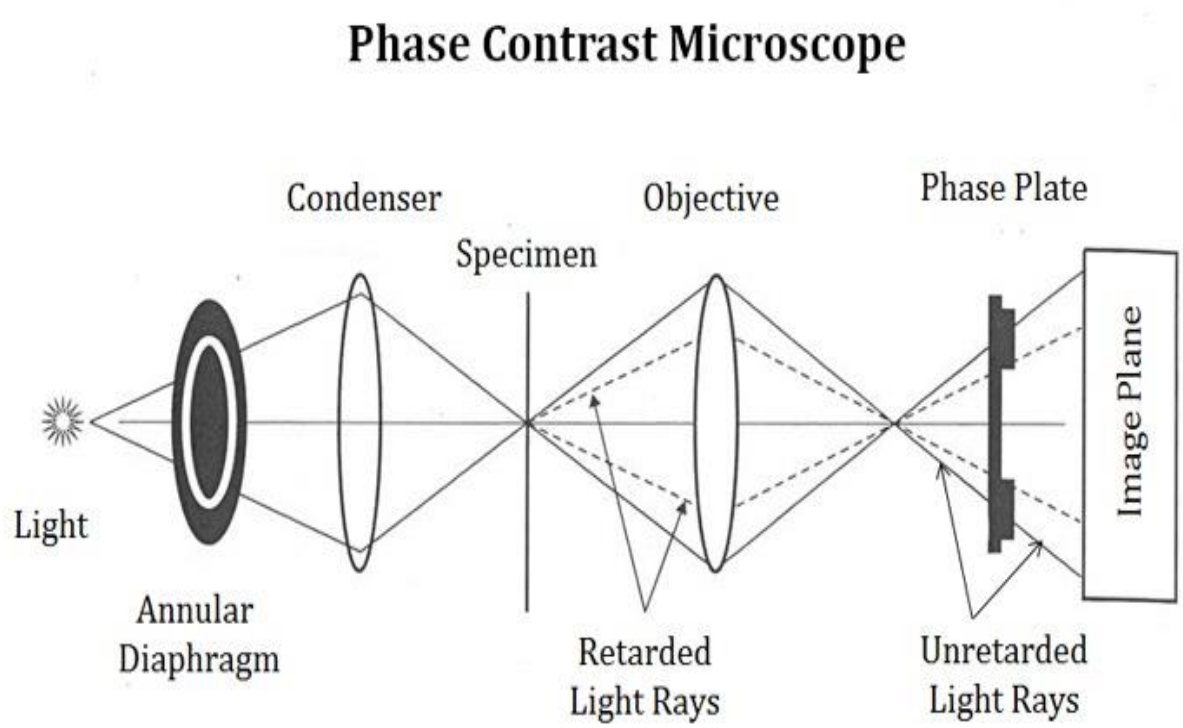


Ray diagram of phase contrast microscope.

Phase-contrast microscopy (PCM) is an optical microscopy technique that converts phase shifts in light passing through a transparent specimen to brightness changes in the image. Phase shifts themselves are invisible, but become visible when shown as brightness variations.

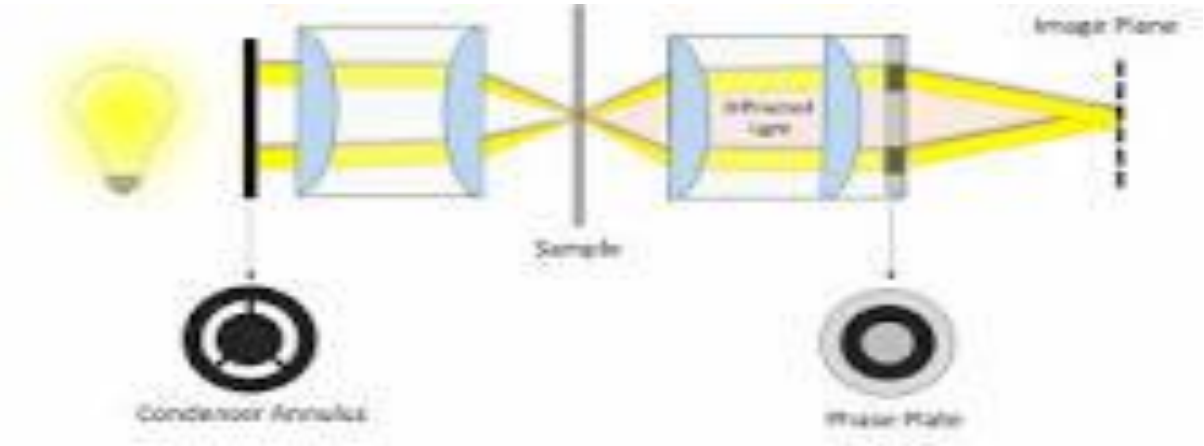
Working principal: The phase contrast microscopy is based on the principle that small phase changes in the light rays, induced by differences in the thickness and refractive index of the different parts of an object, can be transformed into differences in brightness or light intensity.

Advantage: The capacity to observe living cells and, as such, the ability to examine cells in a natural state. Observing a living organism in its natural state and/or environment can provide far more information than specimens that need to be killed, fixed or stain to view under a microscope. High-contrast, high-resolution images.

Difference between phase contrast and bright field microscope:

Phase contrast is preferable to bright field microscopy when high magnifications (400x, 1000x) are needed and the specimen is colorless or the details so fine that color does not show up well. Cilia and flagella, for example, are nearly invisible in bright field but show up in sharp contrast in phase contrast.

Importance parts of phase contrast microscope:



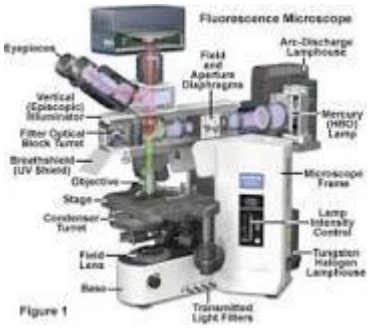
The two components required to convert a traditional bright field microscope into a phase-contrast microscope are the annular diaphragm placed in the condenser back aperture, and the optically matched internal phase plate.

Florescence microscope:

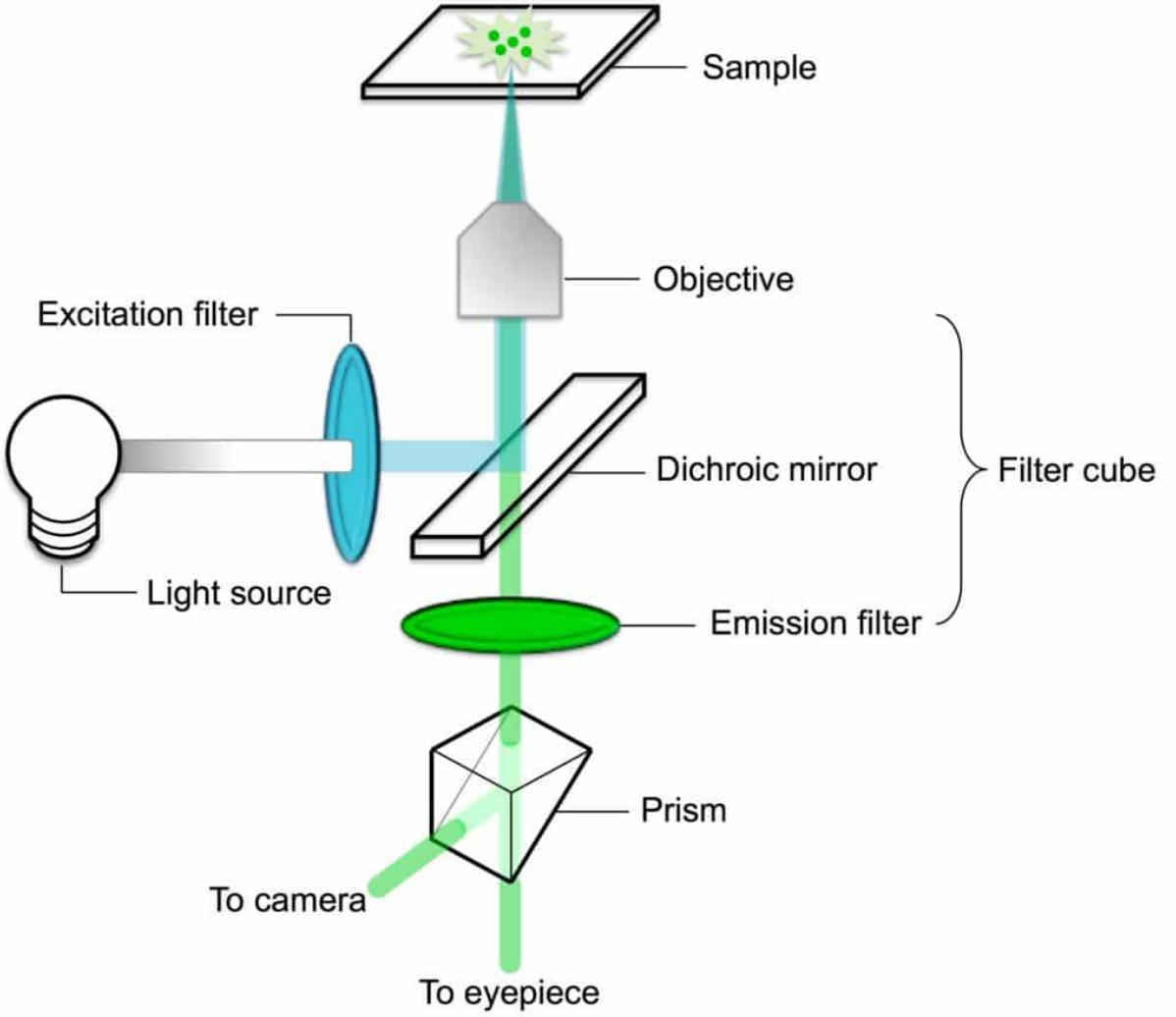
The principle behind fluorescence microscopy is simple. ... The reflected light passes through the objective where it is focused onto the fluorescent specimen. The emissions from the specimen are in turn, passed back up through the objective – where magnification of

the image occurs –and now through the dichroic mirror.

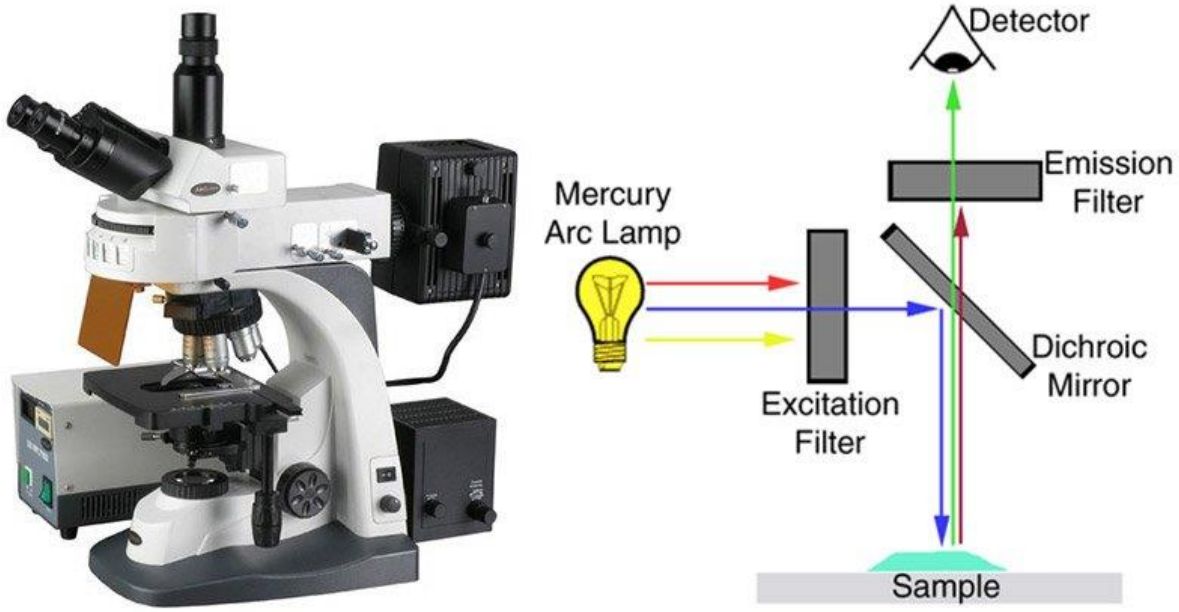
What are the characteristic of fluorescence microscope:



The essential feature of any fluorescence microscope is to provide a mechanism for excitation of the specimen with selectively filtered illumination followed by isolation of the much weaker fluorescence emission using a second filter to enable image formation on a dark background with maximum sensitivity



Ray diagram of fluorescent microscope.



A fluorescence microscope is an optical microscope that uses fluorescence instead of, or in addition to, scattering, reflection, and attenuation or absorption, to study the properties of organic or inorganic substances.

Confocal microscope:

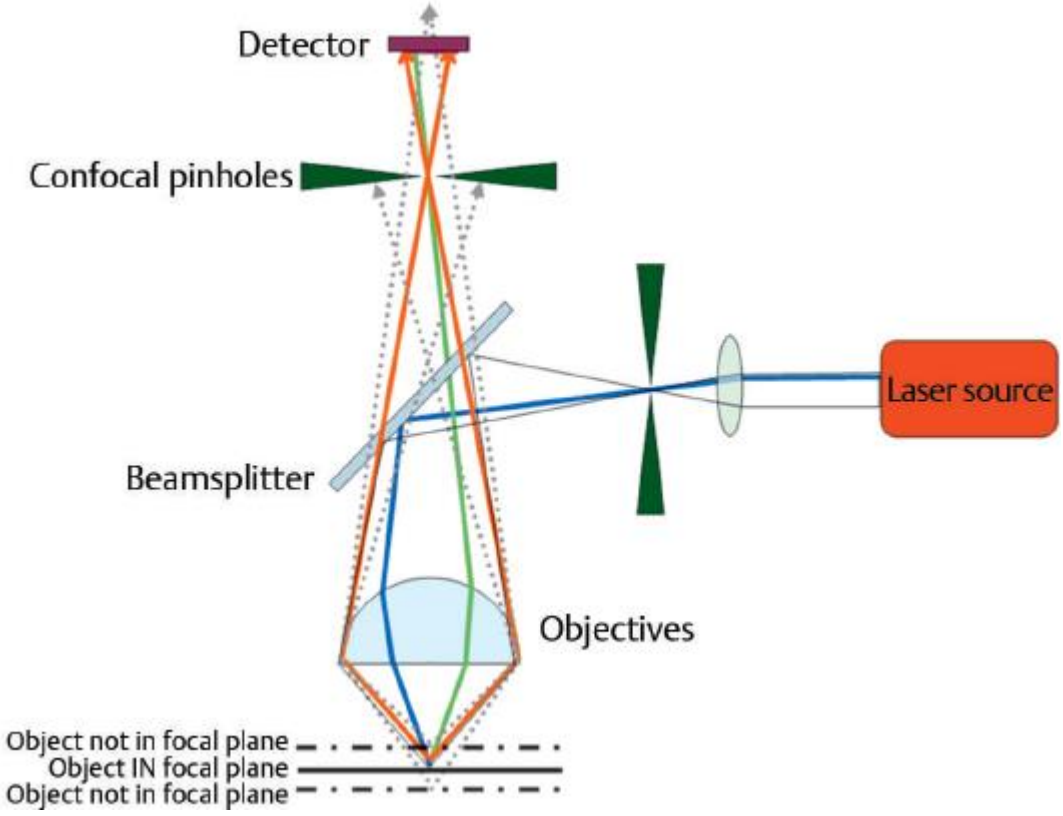
a light microscope with an optical system designed to reject background from matter outside the focal plane and therefore allowing

images of different sections of a specimen to be obtained.

Confocal microscopy, most frequently confocal laser scanning microscopy or laser confocal scanning microscopy, is an optical imaging technique for increasing optical resolution and contrast of a micrograph by means of using a spatial pinhole to block out-of-focus light in image formation.

Confocal microscopy, most frequently confocal laser scanning microscopy (CLSM) or laser confocal scanning microscopy (LCSM), is an optical imaging technique for increasing optical resolution and contrast of a micrograph by means of using a

spatial pinhole to block out-of-focus light in image formation.



Ray diagram of confocal microscope.

What is the difference between confocal and fluorescence microscope:

The fluorescence microscope allows to detect the presence and localization of fluorescent molecules in the sample. The confocal microscope is a specific fluorescent microscope that allows obtaining 3D images of the sample with good resolution. ... This allows to reconstruct a 3D image of the sample.

Confocal microscope and its advantage:

Confocal microscopy offers several advantages over conventional wide

field optical microscopy, including the ability to control depth of field, elimination or reduction of background information away from the focal plane (that leads to image degradation), and the capability to collect serial optical sections from thick .

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