epi-fluorescence
microscope LED

epi-fluorescence microscope

Certain substances by virtue of its chemicals structure are able to give out light of a determined wavelength after absorbing light of lower wavelength. This property is called fluorescence and it is characteristic of certain molecules as for example collagen, elastin, lignin or chlorophyll and a series of chemical compounds, the fluorochrome (FITC, DAPI, TRITC) with large and varied applications; among them two routine techniques in research and diagnosis laboratories, for carrying out them it is indispensable to use a fluorescence microscope:

- Immunofluorescence (IF): it consists of detecting and marking certain molecules of interest to biopsies or histology cuts through the utilization of specific antibodies conjugated with a fixed fluorochrome, this allows the diagnosis of certain diseases.
- Hybridization in place with fluorescence (FIPH): it consists of the hybridization of certain DNA fragments thanks to waves marked with fluorochromes, allowing mutations detection and genetic alterations therefore it is useful for antenatal diagnosis and for detection and diagnosis of certain tumors.

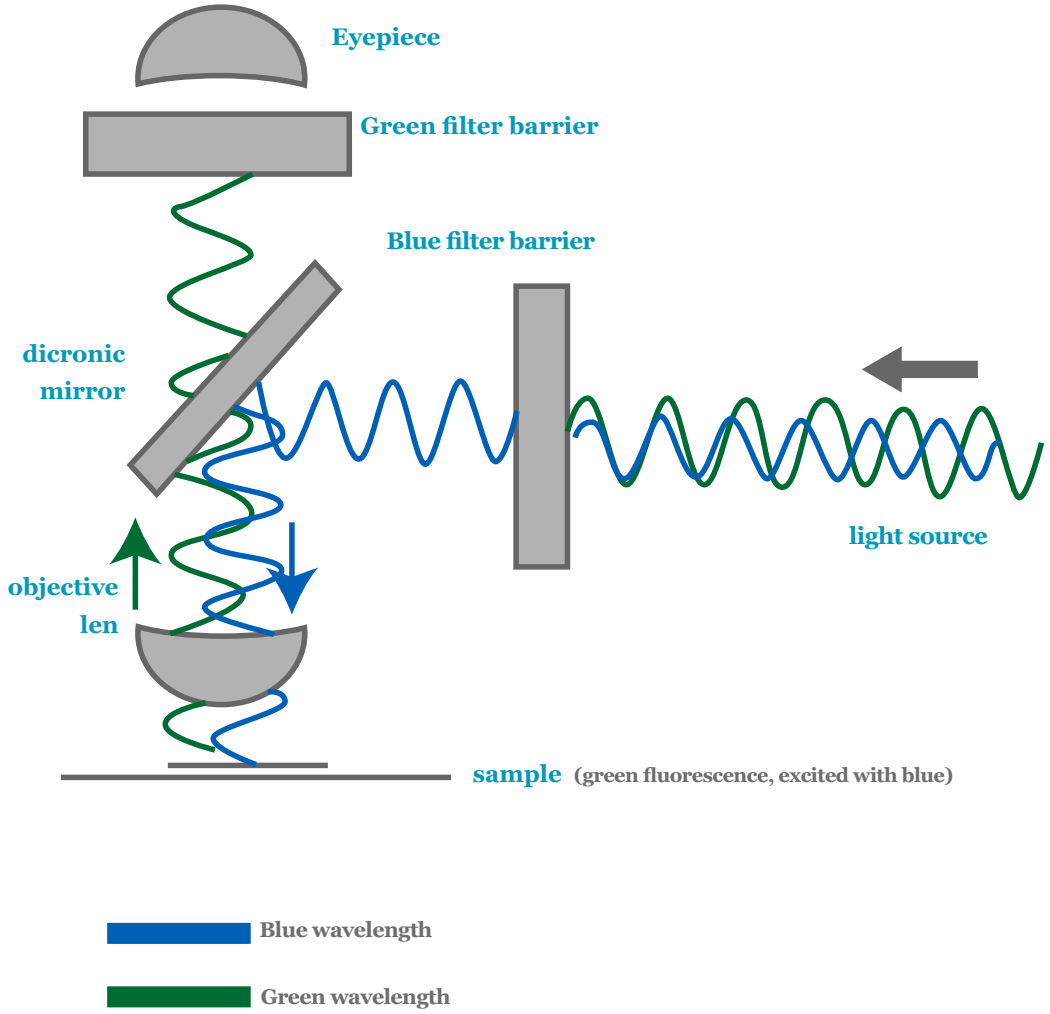
theoretical foundations

Epi-fluorescence o fluorescence of reflected light is basis on the incidence of a light beam of a determined wavelength. This sample absorbs energy from incident light and at the same time it emits light at a greater wavelength.

To allow this phenomenon is requiered the utilization of a filters system (cubes) with the following components:

- Excitation filter (XF): selects the light of the incident wavelength.
- Dichroic mirror (DM): reflects the light of certain wavelength while it allows to pass the light of greater wavelengths. Therefore, it reflects excitation light and it reaches the sample while it allows to pass emited light of the fluorescence substance.
- Emission filter or barrier (BA): selects fluorescence wavelength emited by the fluorochrome and it allows to reach to the eyepiece.

Following graphic shows an operating sketch of the epi-fluorescence microscope. Light comes from source (LED lamp), it goes through a first filter which selects wavelength, this wavelength is able to excite the fluorochrome. This light is reflected in a dicronic mirror and it has an effect on the sample, exciting the fluorochrome which emits photons of a greater wavelenght than the incident. Emited light by the sample is not reflected but it goes through the dicronic mirror and it reaches a second filter which selects emission wavelength of fluorochrome, allowing to reach the eyepieces.



epi-fluorescence microscope

Development of light fluorescence microscope LED lamps presents a breakthrough on the traditional mercury lamps because of lower energy consumption and no heat production. Moreover, lamps durability is vastly greater and their use is immediate since it is not necessary to wait for lamp heating or beam of light focusing.

- Our epi-fluorescence microscope has 5W LED lights, power regulator, blue and green filters and it provides an unbeatable source of light in 450-560 nm wavelength range with great intensity.
- In addition to that, it allows to use a large number of fluorochromes such as FITC, GFP, YFP, auramine, Alexa fluor 488 and Cy2 with blue filter. While, wlth green filter others like TRITC, fioeritrine, ethidium bromide, rhodamine and Texas red.
- Besides, it can be used in many applications in biology and medicine such as immunofluorescence, different molecules and tissues marking, cell divisions observation, normal and pathological cell differentiation, tuberculosis and malaria studies, in situ hybridization (FISH), etc.

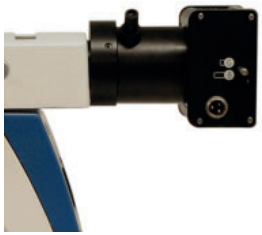
Sidentopf type trinocular head, inclined 30º and rotary 360º

Inverted quintuple nosepiece

Field diagram for the epi-fluorescence light and locking handle.

LED light system and condenser Abbe N.A. 1.25 with diaphragm type.

Swicht of LED blue lamp to green 5W lamp



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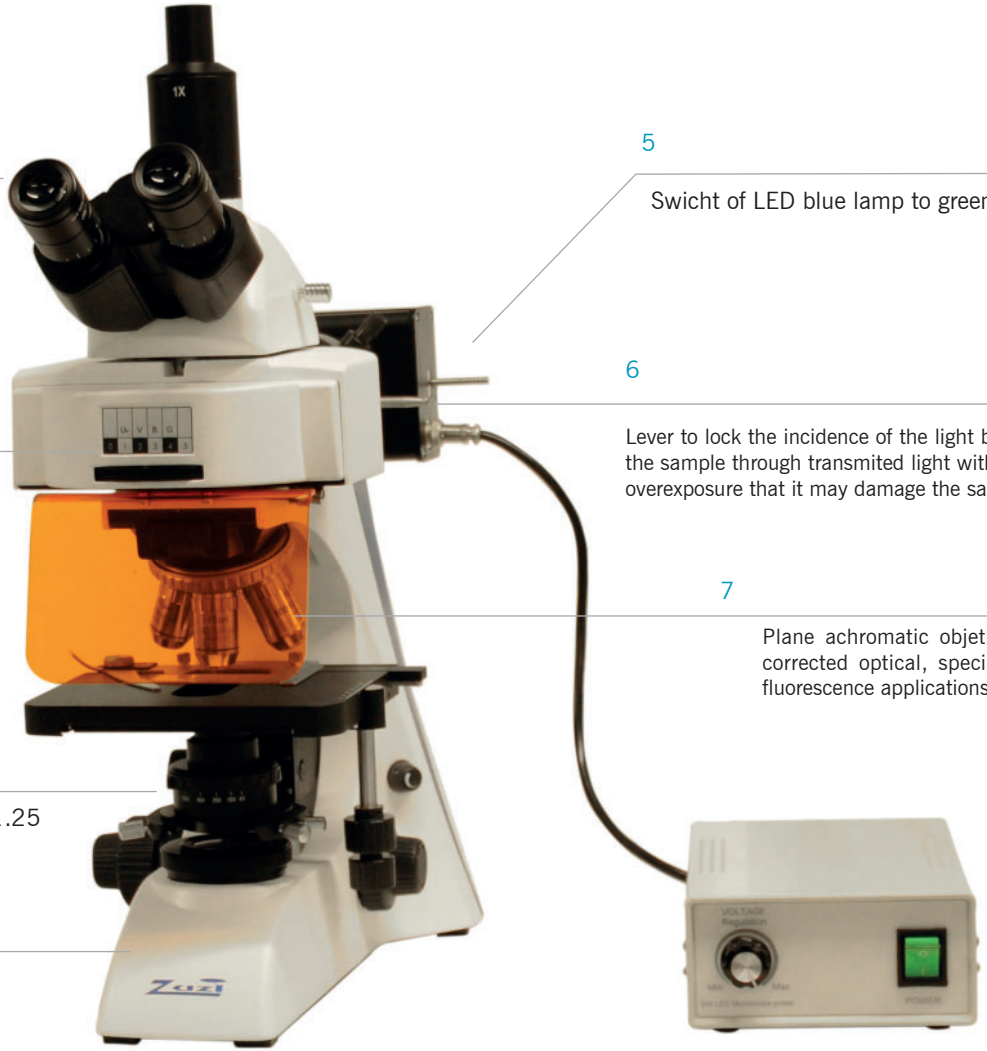

1

Sidentopf type trinocular head, inclined 30º and rotary 360º

2

Turret with different interchangeable positions to select excitation filter of cube and emission of wavelength more appropriate for the used fluorochrome (filters green and blue included).

3

LED light system and condenser Abbe N.A. 1.25 with diaphragm type.

4

Broad and solid base that provides great stability to the equipment.

5

Swicht of LED blue lamp to green 5W lamp

6

Lever to lock the incidence of the light beam on the sample; allows the observation of the sample through transmited light without turning off the LED lamp and avoiding an overexposure that it may damage the sample.

7

Plane achromatic objetives with infinity corrected optical, specially designed for fluorescence applications.

8

Power supply of the LED lamp with potenciometer.

technical features

Code	HBF002
Head	Sidentopf type trinocular, inclined 30º and rotary 360º and interpupillary distance 48-75 mm
Eyepieces	WF 10X /20 MM
Nosepiece	Inverted quintuple
Objetives	Infinity corrected
	4×/0.10
	10×/0.25
	20×/0.40
	40×(S) /0.66(S)
	100×/1.25(Oil) (S)
Mechanical stage	Double bed 180 x 145 mm; Movement 90 x 60 mm
Condenser	Abbe N.A. 1.25 with diaphragm
Light	3W LED lamp
Filter	Blue
Epi-fluorescence	Blue and green LED lamps
Excitation filters	Blue and green