OLYMPUS Your Vision, Our Future

Bioluminescence Imaging System LV200

Key Features

- Unrivalled sensitivity and resolution in bioluminescence microscopy
- Extremely light tight enclosure
- Environmental control for ultra-long live cell studies
- Compatible with a broad range of cameras and objectives

Specifications

Observation methods	Luminescence imaging, transmitted bright field, basic transmitted fluorescence
LV200 main body	Light tight dark box Manual objective lens focusing Co-axial XY stage Motorised exciting filter wheel with 3 positions for standard 25 mm optical filters Motorised shutter integrated in filter wheel Motorised emission filter wheel with 6 positions for standard 25 mm optical filters Condenser for transmission bright field coupled to light guide C-mount for camera Tube lens optimised for luminescence imaging, 0.2 x magnification
Accessories and options	
Illumination unit	External halogen lamp housing coupled with light guide
Objectives	Integration of all standard size Olympus objectives possible
Controller	IX-UCB Controller for filter wheels, illumination and shutter
Hand switch	Hand switch for filter wheels, illumination and shutter
Environmental control	Double-layered chamber type incubator for 35 mm dish including controller, stage heater, top cover heater, main body heater, flowmeter for 5% CO_2, 95% air
System table	ca. 700(H) x 600(D) mm (needed if large size camera is used)
Motorised z-focus drive	Adaptor for motorised z-focus, controller
Computation	Imaging computer with at least: Intel Core 2 Duo, 2GHz, 1.5GB RAM, 80GB hard disk, dual head video board, DVD RW, USB, serial, parallel, LAN, Video, Audio on board, keyboard (GB), optical mouse, MSWindows XP
Device controller	Controller board for timing of experiments, mounted inside imaging computer, control CCD trigger, filter wheel, shutter and peripherals
Monitor	Computer flat panel monitor 20" TFT
Software	Basic imaging software cell^M for MSWindows. Graphical interface for experiment planning and execution ("Experiment Manager"). Structured database for multi-dimensional data handling. Simple measurement functions.
Camera options	Depending on application and required sensitivity cooled CCD cameras, EM-CCD cameras or deep cooled slow scan CCD cameras can be used. (Please ask for camera / software compatibility)
Power consumption	Main unit 850 VA Controller 840 VA
Installation space	ca. 1500(W) x 750(D) mm (differ with configuration)
Total mass weight	ca. 70kg (differ with configuration)

LV200 Luminoview - carefully designed for extremely long duration cell bioluminescence microscopy

A completely new optical design delivers a tremendous increase in sensitivity, enabling study of photosensitive cells as well as quantitative analyses. An inbuilt system for temperature control, humidity, and gas flow helps to keep the cultured cells or tissue slices in a healthy condition throughout the entire observation period, and the LV200's unique 'light tight' enclosure shields the sample and optics from any external light. With suitable camera integration times, the matchless optical properties mean that high-magnification objectives can be used to provide exquisite single cell resolution.

Bioluminescence versus fluorescence

Luminescent and fluorescent molecules both use the same process to emit light: electrons in an excited state emit a photon as they return to their ground state. This light is emitted within defined wavelength ranges depending on the molecular structure and therefore different compounds can be used as markers for different events, processes or molecules. The fundamental difference between luminescence and fluorescence is the way in which the excited state is generated in the first place. Fluorescence occurs when the excited state is caused by external stimulation by light, whereas luminescence is caused by a chemical reaction (either a natural, biological one – bioluminescence, or a purely chemistry based one - chemiluminescence).

Luminescent emissions tend to have varying lifetimes and are often quite faint, but due to the absence of background they have a high signal-to-noise ratio (S/N). Because there is no need for illumination researchers have not to worry about bleaching and phototoxic effects. This makes bioluminescence an ideal tool for long live cell observations, studying photosensitive cells and quantitative analyses. Due to the short half life of most bioluminescence markers (firefly luciferase) the signals are not accumulated in the cell. This enables a high dynamic resolution in gene expression studies.

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