Multimode confocal microscope (Leica SP8-SMD)

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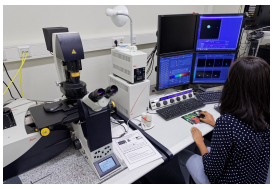

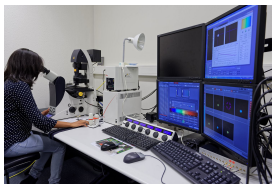

Brand

Leica

Type

SP8

Contact

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Description

Specific fluorescent probes (chemical dyes or fluorescent protein technology) allow temporal and spatial co-localisation of your (bio)molecule of interest, for simultaneous, multicolor, multidimensional , time laps or FRAP imaging.
Information obtained by this technique
(Co)-localisation
Specific fluorescent probes (chemical dyes or fluorescent protein technology) allow temporal and spatial co-localisation of your (bio)molecule of interest. A range of fluorescent probes can be combined for simultaneous, multicolor, multidimensional image acquisition. Specific applications like time laps imaging or FRAP can be performed.
3D reconstruction
Optical sections from the confocal microscope can be achieved using piezo stage (nm resolution) for 3D reconstruction of (bio)molecules, organelles and tissues. 3D reconstruction can also be performed using multi colored images.Dynamics using FCS (fluorescence correlation spectroscopy)
The MM-CLSM has a Single Molecule Detection (SMD) module that allows fluorescence correlation spectroscopy for the quantification of biomolecules either in vitro or in vivo. Furthermore, the diffusion coefficient can be derived for dilute solutions. The interaction between differently labeled molecules can be detected by applying fluorescence cross-correlation spectroscopy (FCCS).Fluorescence lifetime imaging microscopy
The second feature of the MM-CLSM is to perform Fluorescence Lifetime Imaging Microscopy (FLIM). FLIM is a unique and robust technique for the detection of protein interactions in living cells. This FLIM set up allows monitoring multiple fluorescence lifetimes simultaneously.FCS-FLIM
Combination of FCS and fluorescence lifetimes allows the detection of interacting molecules at single molecule level. This technique is mostly applicable for in vitro studies.

Technical Details

The Leica SP8X-SMD high-tech fluorescence microscope is a multi-mode confocal microscope. It combines confocal imaging with single molecule detection (SMD) and advanced (time-resolved) fluorescence spectroscopy. The MM-confocal SMD microscope has a unique configuration including:
• Variable excitation with a supercontinuum tunable white light laser (WLL) source
• WLL confocal imaging using up to eight excitation wavelengths simultaneously
• WLL tunable pulsed excitation with two wavelengths simultaneously for FLIM applications
• Confocal microscope using hybrid detector technology allowing for complete, filter free, and spectral freedom for imaging
• Confocal microscope and time resolved SMD controlled by confocal software platform
• Automatic 3D-FLIM acquisition using a third parameter like wavelength, time or volume.
• FLIM acquisition having time resolution (TTS) of 100 ps or better, and short detector dead time in combination with a high dynamic range

Applications

The MM-CLSM can be using in different research projects, varying from signal transduction pathways in planta to protein folding aspects or detection of fast dynamics in photosysnthesis. Furthermore, specific applications comprise protein interactions (in vitro or in vivo), signal transduction, food processing, single molecule biophysical studies and colloid chemistry.

Complementary Techniques

Next to the supercontinuum laser, this microscope is also equipped with a “standard” argon laser (458, 477, 488, 514 nm) and a pulsed diode laser (440 nm). The microscope operates extreme flexible by the incorporation of an AOBS, AOTF and a 5 channel filter free, spectral HyD detectors.

Publications

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