

Light Sheet Fluorescence Microscopy

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Abstract Text

Light sheet fluorescence microscopy (LSFM) functions as a non-destructive microtome and microscope that uses a plane of light to optically section and view tissues with subcellular resolution.

This method is well suited for imaging deep within transparent tissues or within whole organisms, and because tissues are exposed to only a thin plane of light, specimen photobleaching and phototoxicity are minimized compared to wide-field fluorescence, confocal, or multiphoton microscopy.

LSFMs produce well-registered serial sections that are suitable for three-dimensional reconstruction of tissue structures.

Because of a lack of a commercial LSFM microscope, numerous versions of light sheet microscopes have been constructed by different investigators.

This review describes development of the technology, reviews existing devices, provides details of one LSFM device, and shows examples of images and three-dimensional reconstructions of tissues that were produced by LSFM.

Keywords

OPFOS, TSLIM, light sheet microscopy, optical sectioning

