



Abstract

A London university had developed Oblique Selected Plane microscopy that is a significant development of Optical Plane Microscopy technique and provides a means of correcting for the aberrations that occur in oblique plane techniques. They are looking for partners for licensing agreement and further development.

Description

Conventional optical microscopy provides high resolution images and has a huge range of applications. In many cases, it is desirable to obtain so-called 'optically sectioned' images, i.e. an image of only a thin axial slice through the sample. The conventional method for obtaining high quality optically sectioned images is confocal microscopy.

Confocal microscopy involves scanning a point of illumination and detecting the reflected or fluorescent light back to a confocal point detector. The scanning process can limit the data acquisition rate or increase the peak power at the sample, which can lead to photodamage or phototoxicity of biological samples. Therefore, alternative methods, generally termed 'structured illumination' techniques have been developed. These include Selective Plane Illumination Microscopy (SPIM), which uses two objective lenses, one to illuminate a thin 'sheet' within the sample and the second to produce a diffraction limited image of this sheet. However SPIM has two main drawbacks. It is mechanically difficult to arrange for the two objectives to be placed close enough together, restricting the numerical aperture and resolution of the system, and the need to illuminate the sample with a lens that is in the plane of the sample means that conventional sample preparation techniques, e.g. glass microscope slides, cannot be used.

Oblique Plane Microscopy (OPM) is a new technique in which the microscope is configured so that only an oblique sheet in the specimen is illuminated and this sheet is then imaged by an add-on module placed at

the output of the microscope. OPM requires only the absolute minimum exposure of the sample to excitation light and hence photobleaching and phototoxicity are minimized. Furthermore, the optically sectioned image is acquired directly by the CCD camera and no image processing or deconvolution is required. As a result, OPM also offers the prospect of rapid 3-D fluorescence imaging with minimal photobleaching to the specimen.

Innovations and advantages of the offer

The present invention is a significant development of Optical Plane Microscopy technique and provides a means of correcting for the aberrations that occur in oblique plane techniques. In addition, true selected plane imaging is achieved by the use of a single high numerical aperture lens.

- Minimal photobleaching and phototoxicity
- No side-lobes on 'axial' point spread function (which does occur for Nipkow disc microscopy)
- No moving parts – good for imaging dynamics
- No calculation required to get sectioned image
- Can be a 'bolt-on' to existing microscopes
- Good for 3-D imaging

For further information (including IPR status) please contact:

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