

Glossary

3D	The three spatial dimensions. This report does not refer to other measurements as dimensions, although this is a common practice of microscopists.
Advanced 3D light microscopy	Systems of light microscopy that allow the construction of 3D images of a sample. This report treats all 3D light microscopy as 'advanced'.
Bio-Rad	Bio-Rad Laboratories, Inc.
Bio-Rad UK	Bio-Rad Microscience Ltd.
Bundeskartellamt	The German Federal Cartel Office.
Classical light microscopy	Systems of light microscopy that provide two-dimensional images.
Computer-aided 3D image reconstruction	A range of techniques which use computers to process data obtained via classical light microscopy or confocal microscopy systems in order to remove out-of-focus light.
CLSM	Confocal laser scanning microscopy.
Confocal microscopy	A system that uses a pinhole aperture in the light path and highly sophisticated optics to remove the out-of-focus light information.
Deblurring	Improving the quality, in particular 3D resolution, of an image by removing or correcting for out of focus light. Typically done using computer systems running deconvolution software.
Deconvolution	A technique for deblurring that uses sophisticated mathematical algorithms to analyse and reverse the effects of out of focus light. The technology is typically used to create 3D images.
Electron microscopy	Electron microscopy uses a beam of highly energetic electrons to examine objects on a very fine scale. Samples are examined in a vacuum and require careful preparation.
EPO	European Patent Office.
Femtosecond	10^{-15} second.
Fluorescence	Fluorescence is the emission of visible light from a substance under the stimulation of radiation of a shorter wavelength.

Laser scanning	The process of building up an image by scanning the specimen with a focused laser beam and recording the information detected at each point. Laser scanning microscope systems include CLSM and multiphoton systems.
Leica	Leica Microsystems AG.
Light microscopy	Light microscopes use optical methods to create an image from the light transmitted through, reflected by or emitted from the specimen being studied.
Microscope system	Includes the microscope stand plus the associated equipment such as computers, software and light sources.
Microscope stand	A classical light microscope without the optics.
MPR	Multiphoton ready.
Multiphoton	More than one photon. Multiphoton microscopy is a type of advanced 3D light microscopy , which exploits an effect known as multiphoton excitation. In practice these systems exploit a two-photon effect although in principle effects using more than two photons can be exploited. Very often the terms multiphoton and two-photon are used interchangeably; in particular in the context of multiphoton or two-photon microscopy.
Multiphoton ready	A confocal microscope system that is marketed as relatively easy to upgrade for multiphoton microscopy.
Nikon	Nikon Corporation.
Non-optical sectioning	Systems of advanced 3D light microscopy that require computer processing to remove out-of-focus light.
Olympus	Olympus Optical Co Ltd.
Optical sectioning	Systems of advanced 3D light microscopy that use optical techniques to remove out-of-focus light or to avoid the generation of out-of-focus light.
Photo-toxicity	Damage (in this context, to the specimen) from exposure to light radiation.
Picosecond	10^{-12} second.
Scanning probe microscopy	Scanning probe microscopy covers several related technologies for imaging and measuring surfaces on a fine scale, down to the level of molecules and groups of atoms.
Sensitivity	The amount of light needed to generate an image.
Speed of acquisition	The speed with which image data is obtained from a specimen. The time taken for point by point laser scanning can be

important.

Structured illumination	Structured illumination methods adopt techniques such as the insertion of a grid into the optical system that allows a computer system to combine multiple images in such a way as to remove out-of-focus light information.
Subpicosecond	Less than 10^{-12} second.
Two photon	See multiphoton .
Zeiss	Carl Zeiss Jena GmbH, a private company registered in Germany, which carries on the advanced 3D microscopy business within the Carl Zeiss organization.
Zeiss Cellscience	Carl Zeiss Cellscience Ltd.
Zeiss Group	Carl Zeiss Group.
Zeiss Stiftung	Carl Zeiss Stiftung.
Zeiss UK	Carl Zeiss Ltd.