CTL CENTER FOR TECHNOLOGY LICENSING AT CORNELL UNIVERSITY

THE TECHNOLOGY

A laser scanning microscope produces molecular excitation in a sample by simultaneous absorption of two or more photons thereby providing three-dimensional resolution. Fluorophores having single photon absorption in the ultraviolet or short visible wavelength range are excited by a beam of strongly focused femtosecond pulses of laser light in the red or infrared wavelength range. The fluorophores absorb at about one half or smaller fraction of the laser wavelength to produce fluorescent images of living cells and other microscopic objects. By focusing the laser light, fluorescence, as well as, photobleaching are confined to the focal plane. This technology provides depth of field resolution comparable to that produced by confocal laser scanning microscopes while reducing photobleaching of the sample and can provide high resolution, high contrast, three dimensional images.

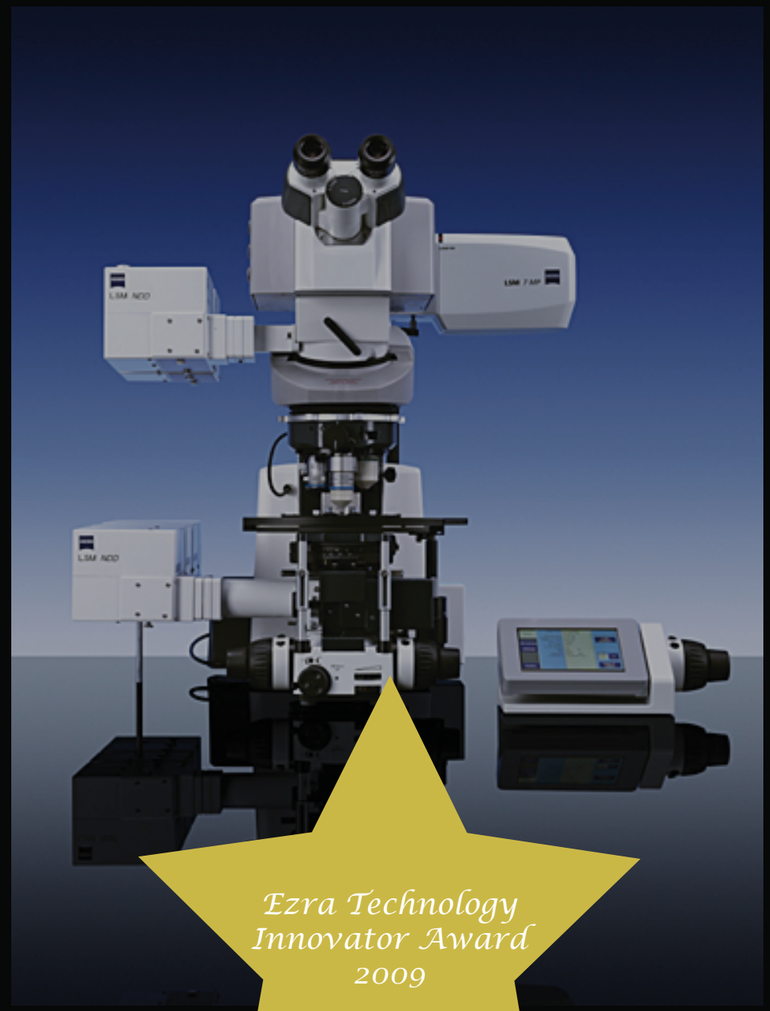
Patent	US 5,034,613
Issued	Jul 23, 1991
Inventors	Winfried Denk, James Strickler & Watt Webb
Patents	US 6,166,385, US 6,344,653
Issued	Dec 26, 2000, Feb 5, 2002
Inventors	Watt Webb & Chris Xu
Licensee	Carl Zeiss MicroImaging GmbH

THE PRODUCTS

LSM 7 MP and LSM 710 NLO

Multiphoton microscopy (MPM) systems by Carl Zeiss use femto-(10^{-15}) second lasers. This pulsed, ultrafast infrared laser excites fluorescent dyes at the focus only - the only place where photon density is high enough to produce fluorescence. This focus results in only a small amount of their light being absorbed by biological tissues, compared with visible excitation light. The result is deep tissue penetration of the excitation light, with low absorption and next to no scattering loss and only minimal phototoxic effects.

MPM offers a decisive advantage in the long-term observation of biological processes: the device's point excitation allows for a significant reduction in phototoxicity, as the light has an impairing effect only in the focus. Whether it is intravital imaging, long-term observation of developmental processes, or high-resolution 3D imaging, MPM delivers true-to-detail and high-contrast images and allows scientists to generate images of surface to very deep-lying tissue with subcellular resolution in a gentle way.



Ezra Technology Innovator Award 2009