JenLab GmbH

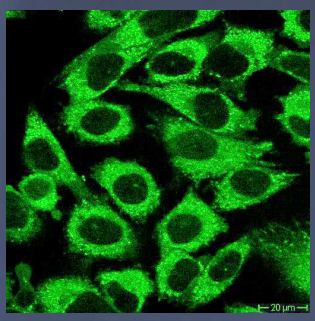
Experts in Femtosecond Laser Technology

2PM™

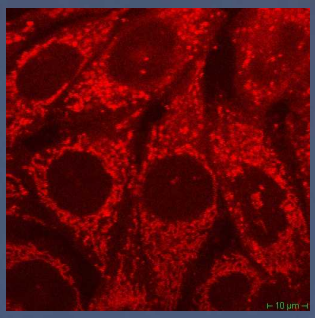
Compact multiphoton microscope

Optical sectioning with subcellular spatial resolution based on near infrared femtosecond laser technology for:

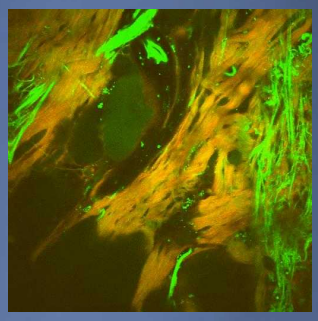
- High resolution imaging of cells and tissue
- Tissue engineering
- *In situ* drug monitoring
- Animal research
- Stem cell research
- Detection of fluorescent proteins
- Neurobiology



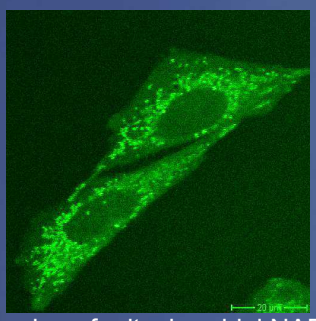
Two-photon autofluorescence



CHO cell monolayer



Optical sectioning of oral mucosa biopsies

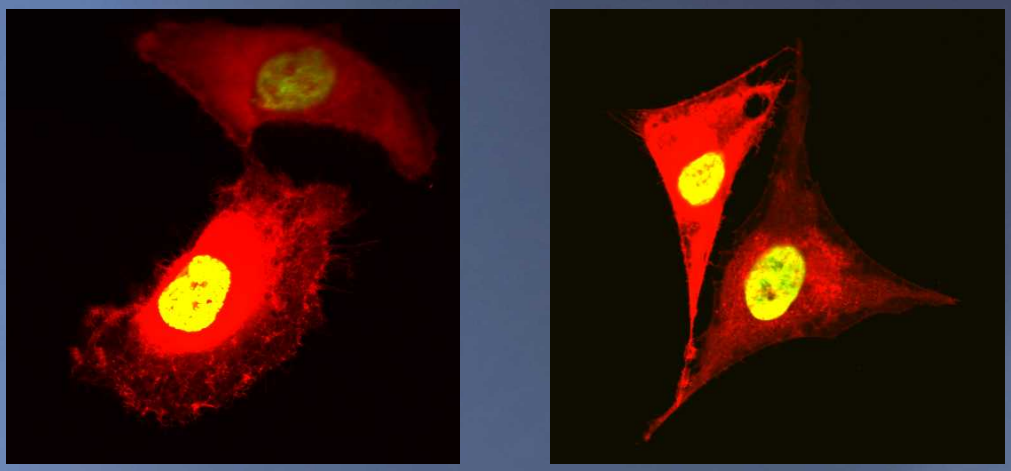


Imaging of mitochondrial NADPH

Multiphoton Microscopy

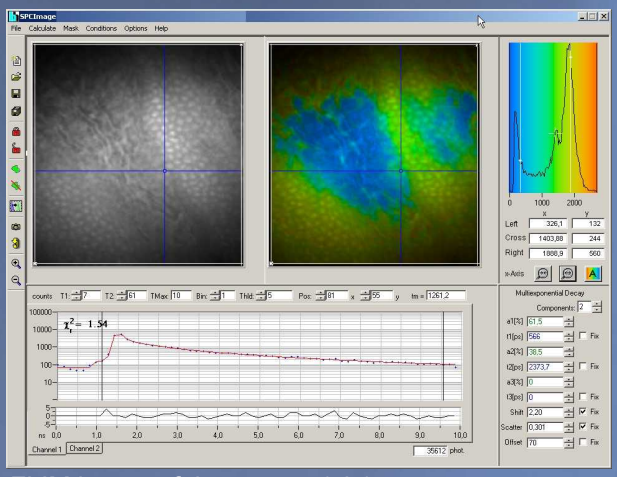
Product description

The *2PM* ™ is an ultracompact, low-price two-photon microscope for life cell and multiphoton deep tissue imaging. Autofluorescence, Second Harmonic Generation (SHG), fluorescent proteins, and exogeneous fluorophores can be detected. Optical sectioning is achieved by xy-galvoscanning and piezo-driven focusing optics.

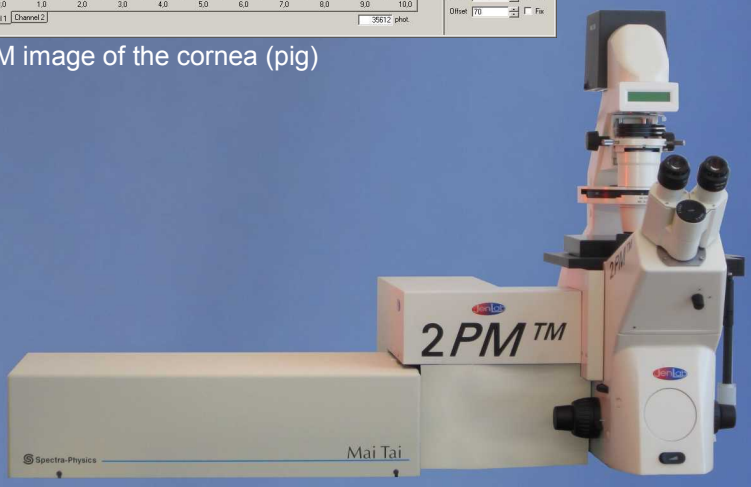


Transfected cancer cells expressing GFP in the nucleus and Ds-Red in the cytoplasm

Multiple exposure modes can be applied: (i) region of interest (ROI) scanning, (ii) single point illumination, and (iii) line scan. Additionally the *2PM* ™ microscope can be equipped with a Fluorescence Lifetime Imaging (FLIM) module based on Time-Correlated Single Photon Counting (TCSPC). The *2PM* ™ is computer-controlled and includes JenLab *Scan* software and *SPCImage* software for data acquisition and image processing.



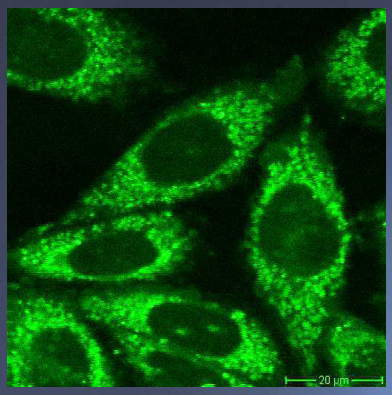
FLIM image of the cornea (pig)



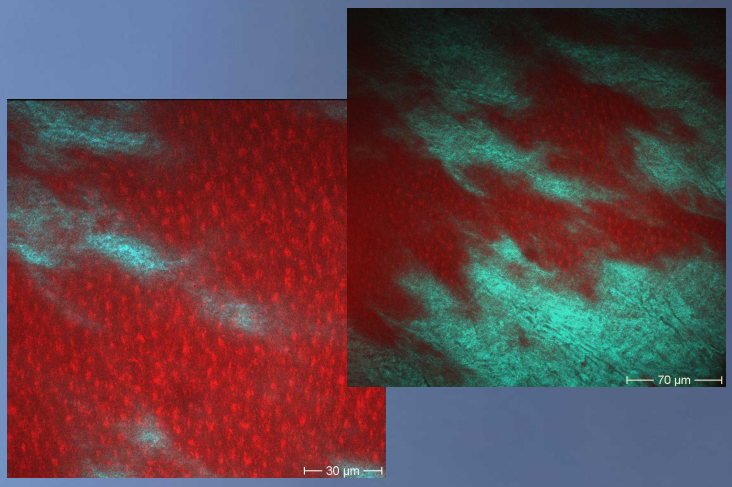
Multiphoton Microscopy

Applications

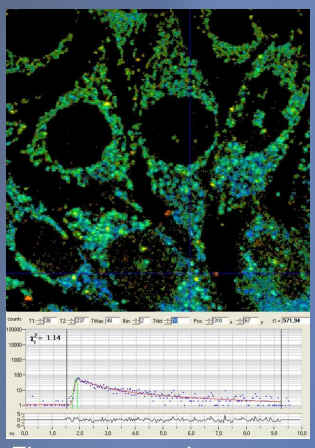
The 2*PM* ™ is a High Tech tool for three-dimensional life cell microscopy. Applications include the detection of fluorescence proteins in transfected cells and transgenic small animals. Furthermore label free imaging can be performed based on two-photon excitation of endogenous fluorophores such as NADPH, flavoproteins, melanin, porphyrins, keratin, elastin, and collagen.



Two-photon autofluorescence

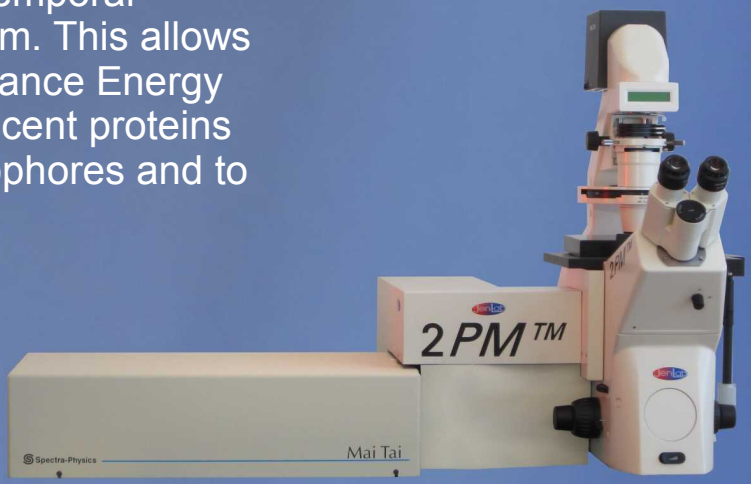


Optical sections through the cornea, autofluorescence (red), SHG (blue/collagen)



Fluorescence decay kineatics of an intracell mitochondrium

The microscope can be expanded to a 4D and 5D imaging tool, respectively, by adding Fluorescence Lifetime and spectral information. FLIM enables the mapping of fluorescence decay times in cells with submicron spatial and 50 ps / 250 ps temporal resolution even in tissue depths of 2 mm. This allows to study Förster (Fluorescence) Resonance Energy Transfer (FLIM-FRET) between fluorescent proteins as well as to distinguish different fluorophores and to probe the microenvironment.

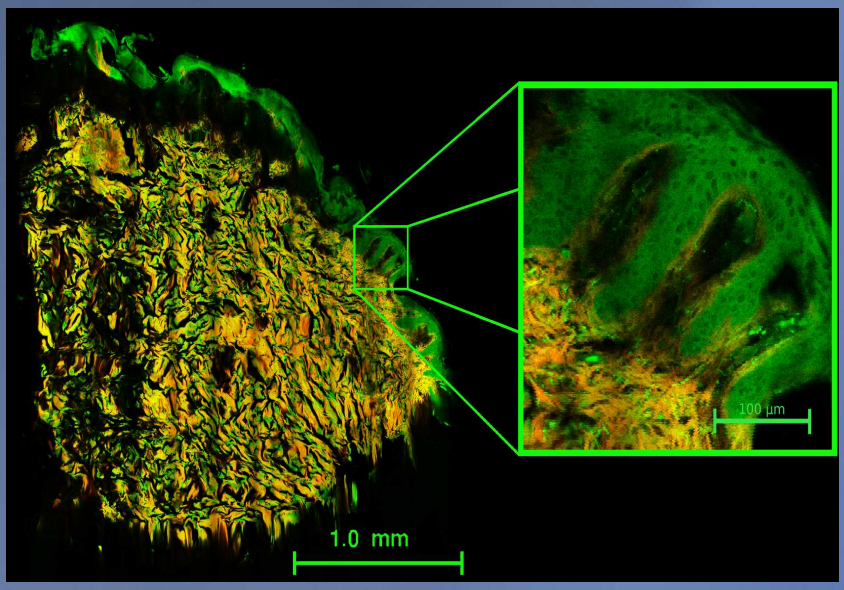


Technical data

- compact turn-key tunable Ti:Sapphire femtosecond laser
  - laser pulse width: 100 fs - 200 fs
  - repetition frequency: 80 MHz
  - laser power: < 1.3 W
  - wavelength range. 710-920 nm
- full-frame scanning, region-of-interest (ROI) scanning, line scanning, single-point illumination (spot scan)
- typical FOV: 250 µm x 250 µm (horizontal); WD: < 2 mm
- typical spatial resolution: < 0.5 µm (horizontal); < 2 µm (vertical)
- typical temporal resolution: 200 ps (TCSPC, up to 256 time channels)
- focusing optics: 40x NA 1.3 (standard), other objectives possible
- control and image processing software (JenLab Control, JenLab Image)
- operating temperature 15-35°C
- relative humidity: 5-65 %
- power requirements: 230 VAC (50 Hz) or 115 VAC (60 Hz)
- CE certified
- 700x520x800mm³ (without laser)

The system requires an air-conditioned room with reduced ambient light.

Notes: These specifications are subject to change without notice.



Wide field two-photon image of a histological section after fixation with formalin and paraffin

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