Two-Photon Microscopy (2PLSM) on Cell-Biohydrogel Hybrids

R Schade[1], J Martini[2], D Anselmetti[2], K Liefeith[1]

[1]Institute for Bioprocessing and Analytical Measurement Techniques, Heilbad Heiligenstadt, Germany
[2]University of Bielefeld, Faculty of Physics, Biophysics and Applied Nanoscience, Bielefeld, Germany

Innovation

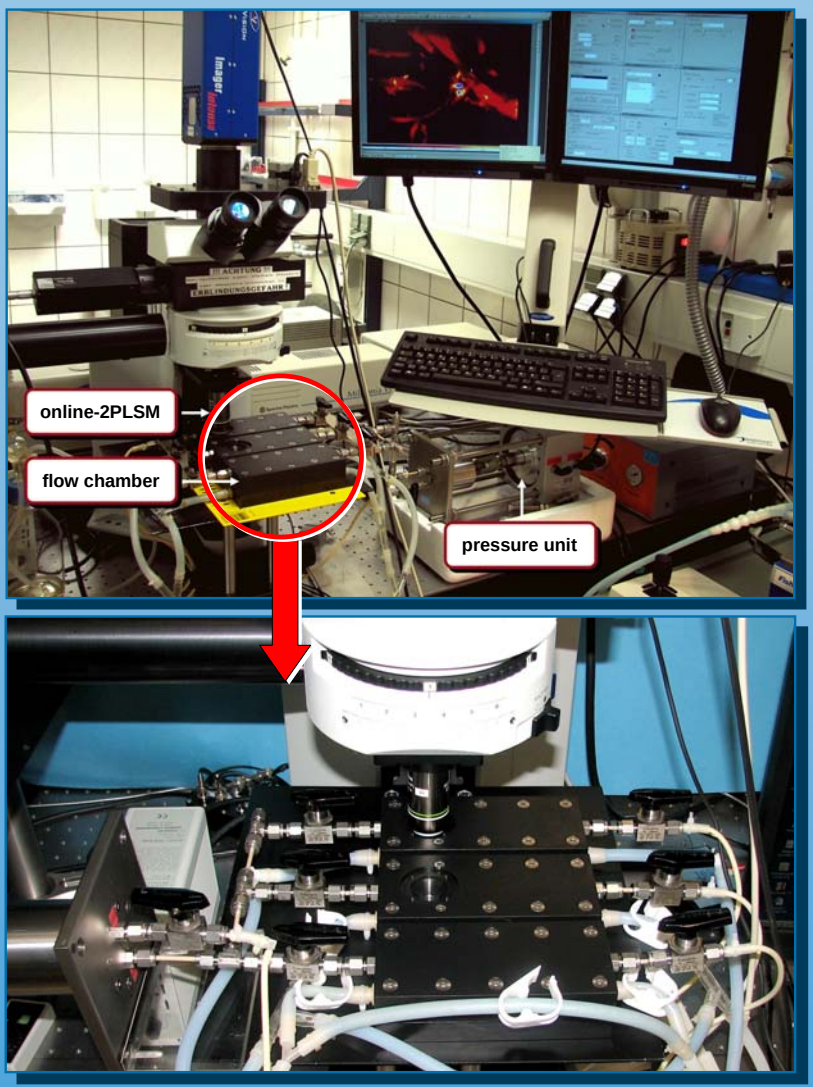
Combination of cell and tissue cultivation on biohydrogel scaffolds under mechanical stimulated conditions with the non-invasive optical control (**online-analysis**)

Two-Photon Microscopy

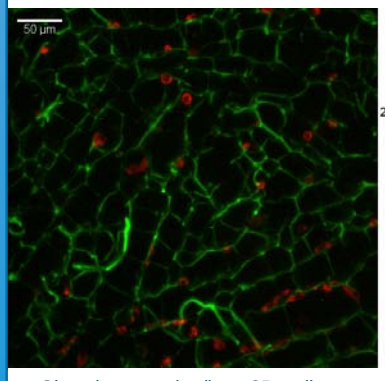
- NIR-excitation (760-980 nm)
- 2P-effect by means of a femto-second pulsed laser
- excitation of autofluorescence
- optical 3D-analysis of biological samples up to a depth of more than 1 mm (X-Y-Z laser scanning)

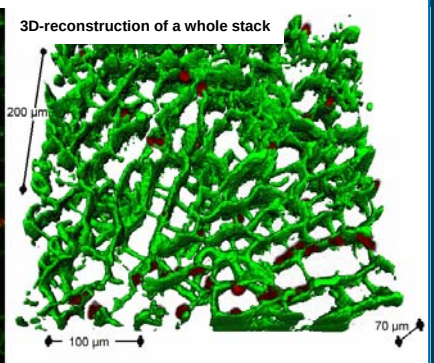
Features

- spectral analysis of autofluores-cence signals of three-dimensional cell and tissue constructs by means of spectrographs or suitable filter sets within the optical detection path
- selective visualization of untreated cells and tissues by false color imaging
- 3D-rendering and quantification of cells and tissues by means of image analysis
- Fluorescence Lifetime Imaging Microscopy (FLIM)
- analysis of cellular interactions



Application example





Chondrocytes (red) on 3D-collagen scaffolds (green): untreated sample, false color image based on differences between the autofluorescence spectra of these main components (spectral unmixing)

Contact: Dr. K. Liefeith, Phone: +49 3606 671170, e-mail: klaus.liefeith@iba-heiligenstadt.de