MULTIMODAL HOLOGRAPHIC MICROSCOPE
– A FULLY AUTOMATED INSTRUMENT

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ABSTRACT:
Fully automated Multimodal Holographic Microscope (MHM) was developed in collaboration between Experimental Biophotonics group from CEITEC Brno University of Technology and Tescan company.
MHM is an instrument for quantitative phase imaging based on patented technology of coherence-controlled holographic microscopy [1]. MHM is designed mainly for biological applications being fully motorized inverted microscope complemented with the environmental incubator. Developed automatic adjustment and control processes enable easy operation of the instrument and make the microscope stable even in long term experiments. Owing to incoherent illumination MHM has better lateral resolution than laser based holographic microscopes and enables imaging even through scattering media.
MHM enables to combine holographic microscopy with fluorescence mode in one instrument. Thereby long term observation of processes in holography can be verified as for cells are concerned afterwards by identification in fluorescent mode.
Quantitative phase imaging in combination with fluorescence microscopy was used in innovative study of cell death [2]. Time lapse quantitative phase imaging of changes in cell morphology and following inspection in fluorescence mode were compared to flow-cytometry analysis of cell death using the annexin V/propidium iodide assay. In result MHM was proposed as a suitable tool to estimate the cell fate.

REFERENCES:

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