

AUTOMATED CONFOCAL IN VIVO MICROSCOPY BASED ON SPINNING DISKS

**Michal Kozubek¹, Petr Matula¹, Pavel Matula¹, Miroslav Varecha¹, Jana Amrichova¹,
Vladan Ondrej², Emilie Lukasova², Stanislav Kozubek²**

**¹Laboratory of Optical Microscopy, Masaryk University
Botanicka 68a, CZ-60200, Brno, Czech Republic
E-mail: kozubek@fi.muni.cz**

**²Laboratory of Molecular Cytology and Cytometry, Institute of Biophysics,
Kralovopolska 135, CZ-61265, Brno, Czech Republic**

The successful development of non-invasive quantitative visualization techniques for live cell imaging have led to the development of suitable hardware and software for the acquisition and processing of multidimensional image data. Confocal spinning disk systems (based either on a classical Nipkow disk or on the microlens principle) are especially suitable for in vivo imaging thanks to high acquisition speed (parallel imaging of thousands of points), high quality image detection (up to 90% quantum efficiency at negligible noise levels with state-of-the-art cameras), low photobleaching and low phototoxicity. Lately, we have been working on the optimization and automation of image acquisition and processing for this type of microscopy [1]. Special attention has been paid to ultra-fast image acquisition mode. This poster presents both hardware as well as software approach used in our laboratory. It also shows examples of biological tasks that are being solved using the automated confocal in vivo microscopy systems.

References:

[1] M. Kozubek, Pe. Matula, Pa. Matula, S. Kozubek, "Automated acquisition and processing of multidimensional image data in confocal in vivo microscopy", *Microsc Res Techniq*, **64(2)**, 164-175 (2004).