

## Press release

### Micro- und nano-cuts to the functionality of life

*Hanover, 20.02.2010* - A nano-dissection system based on ultrashort laserpulses now allows direct observation and controlling of development processes in small model organisms. Implemented in a laser microtome, this innovative technology developed by ROWIAK GmbH, opens new prospects in the field of Tissue Engineering and in the production of hard tissues like bones and teeth. Rowiak will present its *CellSurgeon* and *TissueSurgeon* systems at the Analytica trade fair (23<sup>th</sup> to 26<sup>th</sup> March 2010) in Munich.

Based on a femtosecond laser, the fundamental principle of this technology is a function-preserving manipulation of native tissue samples (Tissue Surgeon) and direct manipulation of single cells or rather their structures (CellSurgeon). Depending on the texture of the samples, this technology allows a cutting depth down to 200 µm and a section thickness from 10 to 100 µm. Even three-dimensional cuts into lower tissue layers are possible. For most samples it is not necessary to embed or chemically fix them. Both commercially available systems represent an ideal combination of a nano-cutting tool and a high-end imaging system. The CellSurgeon, working on sub-cellular level, is equipped with a trademark fluorescence microscope, the TissueSurgeon with the most recent OCT imaging technology.

#### Applications in life science und material science

Since its market release in 2008, CellSurgeon has successfully been employed by different life science laboratories for diverse applications, such as the systematic ablation of mitochondria in apoptosis research or the precise perforation of cell membranes in stem cell research to introduce foreign genetic material. Precise manipulation without injuring the cellular environment and surrounding cells ensures extremely high survival rates of the observed cells – an important requirement for studies in small model organisms such as drosophila or zebrafish embryos.

With TissueSurgeon, Rowiak provides an instrument at the application interface of biology und material science for gentle cutting of native cell layers and tissues, as well as for three-dimensional microstructuring of materials. In the field of Tissue Engineering it has just been shown that by treatment of specific substrates with a focused laser beam, the adhesion of cells can be improved significantly. Other benefits: Specific pressure- and temperature-sensitive soft tissues can be sectioned by TissueSurgeon without any contusion normally caused by mechanical stress. Moreover, hard tissues such as bones or teeth need not be decalcified.

CellSurgeon and TissueSurgeon can be adapted to many different tasks in medical or biological studies and material science. The Rowiak team is looking forward to your specific requests at the Analytica 2010.

**Welcome to hall 3, booth 230!**

**Please contact:**

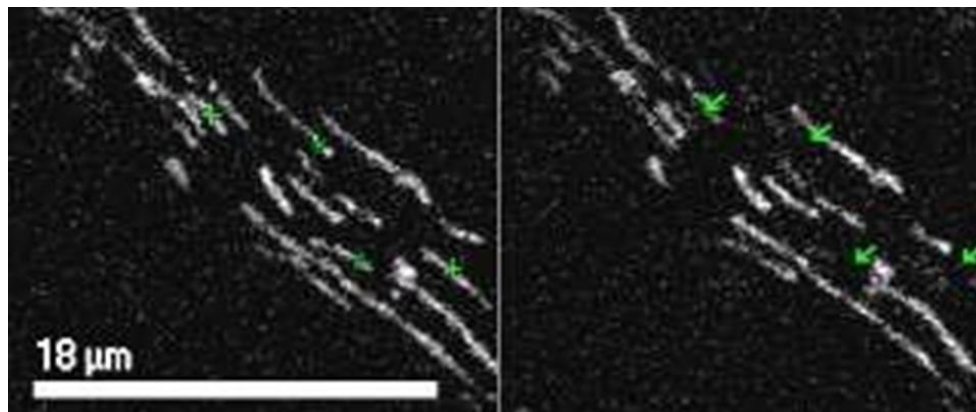
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Image:



Ablation of mitochondria by CellSurgeon - left: before, right: after ablation  
(Lydia Kruppe, Institut für Biophysik, Hannover)