3D Visualization of Biological Cells

Biological cells are by and large transparent materials, where various constituents have different refractive indices. Their visualization can be performed by MicroPhase® measurement system, used together with a conventional microscope, in less than 5 sec. In the 3D cell visualization experiment, a muscular cell is placed on the Zeiss Axiocam 1D.m Imager, equipped with x20 microscope objective. MicroPhase® obtained a 3D picture of the sample. This representation can be used to segment and count cells, as well as serve as a general background for identification of the cell's constituents, marked by fluorescent agents.

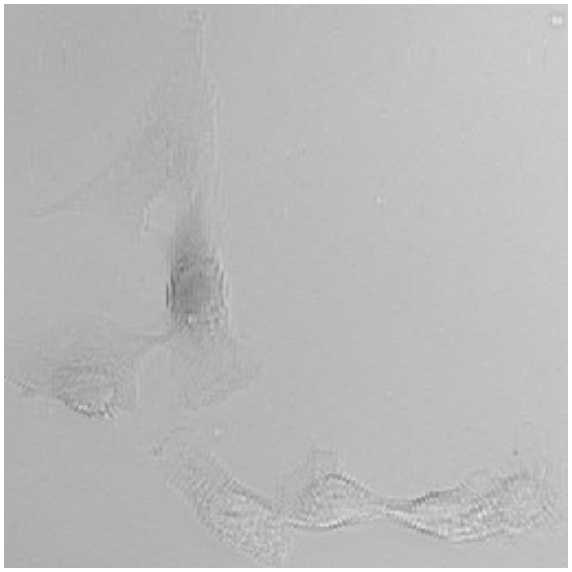
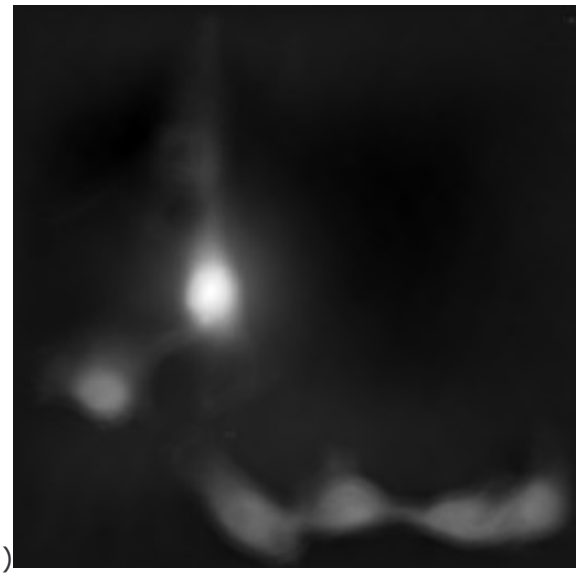
a)  b) 

Figure 1. Muscular cell: a) Bright field image; b) image of the optical path difference (OPD), that can be used to segmentation and counting purposes.

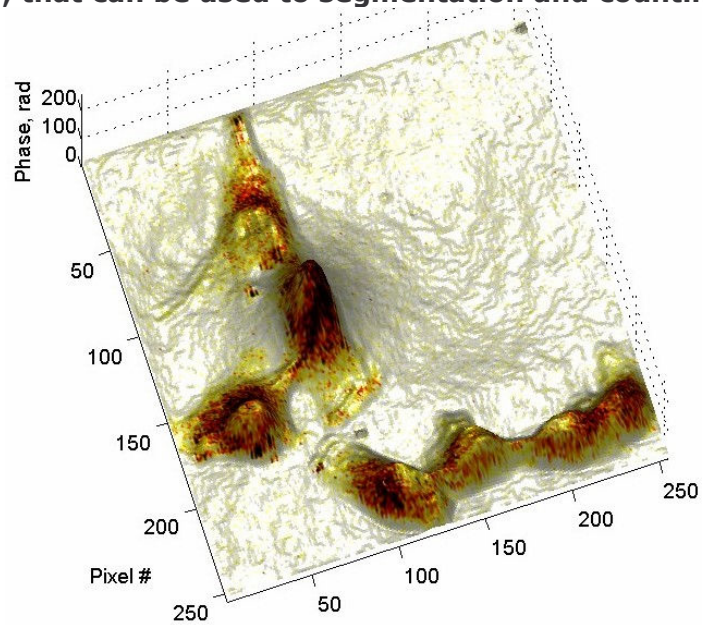


Figure 2. 3D image of the optical path differences, that can be used as a background for the purposes of localization of cell's constituents by fluorescent markers. Here, a fluorescence image is superposed onto the 3D OPD image.

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