REFRACTIVE INDEX DETERMINATION OF ADHERENT CELLS USING INTERNALIZED MICROSPHERES AS REFERENCE IN QUANTITATIVE PHASE CONTRAST IMAGES

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ABSTRACT
In quantitative phase-based live cell imaging the intracellular refractive index represents an important parameter. On one hand decoupling of the refractive index and the cell thickness is required, e. g., for reliable investigations on the cell morphology [1,2]. On the other hand the cell refractive index and its spatial distribution is related to the concentration of the intracellular content. We explored a method to determine the mean refractive index of the cytoplasm with digital holographic microscopy (DHM). Silica microspheres that have been incorporated by living cells are used as reference in quantitative DHM phase contrast images from which the refractive index is obtained by a two dimensional fitting procedure [3]. As many cells show a phagocytic behavior the method may be used with a variety of different cell types. Furthermore, as no modification of the experimental setup is required, the principle prospects to be used with several existing quantitative phase contrast imaging techniques.

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REFERENCES