

Method of Laser Interference Microscopy for investigation of erythrocytes

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Laser interference microscopy is widely used for studying the dynamics of the shape and cellular structure of biological objects. The developed approach can be applied to imaging and investigation of living cells and organelles. The LIM method allows to study the native contrastless biological objects without fluorescent probes. It also makes possible to estimate quantitatively change in the optical density, thereby providing not only qualitative but quantitative data at cell different states. The LIM devices are intended for research of a three-dimensional relief of objects and be able to measure the changes of optical density in each point of objects. This value, called as phase height, is the sum of optical density changes in different optical media (for example cell organelles) of the given point of cell.

In case of homogeneous objects, as human erythrocytes, the value of phase height is directly proportional to thickness. So using LIM we can estimate area, thickness, and volume of different forms of erythrocytes (discocyte, stomatocyte and echinocyte). The finding results allow to use LIM as appropriate method for investigation of erythrocytes condition.