INVESTIGATION OF FIBROBLAST BIOMECHANICS BY MICROPIPETTE ASPIRATION TECHNIQUE

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Differences in space-time organization of non-muscle cell motility may be explain by differences in both substrate adhesion and total cell rigidity. For instance noticeable motility differences are shown for normal mouse fibroblasts (NMF) and transformed mouse L-line fibroblasts. However, lower motility and spreading of transformed fibroblasts are not connected with low cellular adhesion to substrate as the special researches demonstrate. In accordance to these results, investigations of mechanical properties of specified above fibroblast types will promote to create adequate biomechanical model of non-muscle cells and, possibly, allow to explain nature of differences in cells spreading and locomotion.

In this work mechanical properties of normal and transformed fibroblasts are investigated with using of micropipette aspiration technique. Measurements are done with cells, pass initial attachment phase and have spherical form. It was shown, that transformed mouse fibroblasts are more rigid in comparison with NMF. Such result enable to explain lower spreading and motility of transformed fibroblast by enhancing of their tonus. In accordance to find ings fibroblast rigidity increase after glutaric aldehyde treatment and at low temperature, decrease after cytochalasin treatment. No significant changes in

cell tonus observed after adding ATP in culture medium, removal from it fetal calf serum or replace fetal calf serum by human serum albumin. With use of the shell model fibroblast cortical layer elasticity coefficient is estimated to be near 10 $dyn \cdot cm^{-1}$. Correspondence of cortical biomechanical model of non-muscle cell to experimental data is discussed.