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MECHANISMS OF DEDIFFERENTIATION OF THE ADULT HUMAN RETINAL PIGMENT EPITHELIAL CELLS *IN VITRO*. MORPHOLOGICAL AND MOLECULAR-GENETIC ANALYSIS

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The change in the morphology and molecular-genetic profile of human retinal pigment epithelial (RPE) cells *in vitro* was studied under the influence of the basic fibroblast growth factor (bFGF). The cell morphology was assessed by the parameters of the area and perimeter of the cell, the spreading and polarization coefficients. It was shown that, 48 hours after the addition of the factor to the culture, the number of elongated (fibroblast-like) increased as well as the number of cells which size was smaller cells than in the control increased. Simultaneously, the proliferative activity of the cells decreased, which was determined by MTT test. Immunocytochemical analysis showed a decrease in staining for Cx43 and an intensification of staining for OTX2. Quantitative real-time PCR in RPE cells treated with bFGF revealed an increase in mRNA expression levels of *KLF4*, *OCT4*, *NANOG*, *OTX2*, and *NES* genes, with a simultaneous decrease in mRNA levels of *MITF* and *KRT18* genes, which indicates enhanced dedifferentiation. These data are confirmed by a decrease in the expression mRNA level of *COL1A1*, indicating a decline in the synthetic activity of the cells. The results indicate that a single (short-term) effect of bFGF is sufficient to activate a mechanism that lowers the level of cell differentiation toward the neuroepithelium.

Key words: adult human retinal pigment epithelium cells, basic fibroblast growth factor, cell area, cell perimeter, spreading coefficient, polarization coefficient, pluripotent markers