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INFLUENCE OF ATRIAL NATRIURETIC PEPTIDE ON REORGANISATION OF ACTIN CYTOSKELETON AND MIGRATION OF HUMAN MESENCHYMAL STEM CELLS

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Atrial natriuretic peptide (ANP) is one of the key biological regulators and it can affect mechanodependent reactions and actin cytoskeleton organization in cells of different origin. Nowadays, putative role of ANP in endothelial cells is intensively studied, but it remains unclear whether ANP is implicated in physiological processes in mesenchymal stem cells (MSC). Previously, we have shown that ANP can modulate migration potential of MSC obtained from rat perirenal fat. In the present study, we have demonstrated the expression of ANP receptors (A and C type) in MSC obtained from 5–6 week bone marrow of human embryo (FetMSC, Russian Cell Culture Collection, St. Petersburg). We showed that preconditioning of MSC with ANP in nanomolar concentrations (10 nM) induced actin cytoskeleton assembly and decreased cellular motility in wound healing assay experiments. At the same time, we observed no changes in actin cytoskeleton or cell motility after treatment with higher concentrations ANP (1000 nM). ANP can affect on reorganization of actin cytoskeleton and migration of MSC and be a new regulator of cell properties for regenerative medicine.

Keywords: mesenchymal stem cells, atrial natriuretic peptide, cellular migration, actin cytoskeleton