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ION HOMEOSTASIS DURING THE GROWTH OF HUMAN MESENCHYMAL STEM CULTURE. II. AGE-RELATED CHANGES IN CELL K^+ CONTENT

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Ion homeostasis as determined by intracellular K^+ and Na^+ contents has been examined in long-term cultures of human mesenchymal stem cells (MSCs). The intracellular K^+ content was found to be dependent on the age of cultivated MSCs, namely, in the early-passaged MSCs (at 2^{nd}—4^{th} passages), K^+ content per 1 g cell protein was by almost 40 % higher than in late-passaged (12^{th}—15^{th} passages) cells. Under the same conditions, cell Na^+ content per 1 g cell protein was unchanged being independent on the MSCs culture age. In late-passaged MSCs cultures the decline in K^+ content per g cell protein was correlated with the accumulation of G_1 cells in the population. Based on the data on monovalent ion transport in permanent cell lines of different origin, hu-

man stem cells as well as in activated human lymphocytes, the mechanism of potassium ions participation in cell proliferation has been discussed. It is assumed that changes in cell K^+ content per 1 g cell protein which accompany the onset or inhibition of cell proliferation are related to the K^+ involvement in cell volume regulation. The high intracellular K^+ content is important for successful hMSCs proliferation and cell K^+ content per cell protein is an informative test for assessing the functional status of stem cells *in vitro*.

K e y w o r d s: cell potassium content, cell sodium content, potassium fluxes, Na^+,K^+ pump, proliferation, human mesenchymal stem cells