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OSTEOINDUCTIVE PROPERTIES OF HUMAN MESENCHYMAL STEM CELLS SECRETOME OBTAINED BY AUTOMATIC CELL CULTIVATION SYSTEM

S. A. Aleksandrova^{a,*}, Y. A. Nashchekina^a, S. V. Nadezhdin^b, S. A. Vasilyev^c, R. R. Savchenko^c,
 L. A. Pokrovskaya^d, M. I. Blinova^a, N. A. Mikhailova^a, and M. G. Khotin^a

^aInstitute of Cytology Russian Academy of Sciences, St. Petersburg, 194064 Russia

^bBelgorod National Research University Belgorod, 308015 Russia

^cNational Research Tomsk State University Tomsk, 634050 Russia

^dResearch Institute of Medical Genetics, Tomsk National Research Medical Center, Tomsk, 634050 Russia

*e-mail: alekssvet2205@gmail.com

The secretome of human mesenchymal stem cells (MSCs) after osteogenic differentiation of FetMSC *in vitro* was produced for regenerative therapy of bone tissue. The secretome was obtained from serum-free conditioned medium (SFCM) from human mesenchymal stem cells (MSCs) *in vitro* after osteogenic differentiation. To obtain a standard sample of large-volume SFCM FetMSC cells (700 million) were harvested in a CompacT SelecT automated system (Sartorius, UK). SFCM was concentrated by ultrafiltration, subjected to dialysis and dried in a vacuum rotary evaporator. The osteoinductive properties of the SFCM concentrate (SFCMC) in two experimental variants were studied on MSCs. No changes of the cell morphology were revealed during cultivation in the presence of SFCMC. Analysis of the expression of transcription factors Runx2 and YAP1 (markers of osteogenic differentiation) by immunofluorescent analysis and RT-PCR demonstrated an increasing level. The results allow us to conclude that it is possible to use SFCMC from previously differentiated in the osteogenic direction MSCs to induce differentiation of other MSCs in the osteogenic direction. The effectiveness of the developed method for producing the secretome from SFCM of human MSCs differentiated in the osteogenic direction has been demonstrated. The obtained results showed the perspective of MSCs secretome exploration for the creation of biomedical cell products for bone restoration.

Keywords: human bone marrow mesenchymal stem cells, FetMSC cell line, osteogenic differentiation, secretome, automated cell culture station, Runx2, YAP1