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THE DERIVATION AND CHARACTERIZATION OF MESENCHYMAL STEM CELL LINE, ISOLATED FROM HUMAN PULP OF A DECIDUOUS TOOTH

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The derived and characterized the new non-immortalized human mesenchymal stem cell lines isolated from pulp of a deciduous tooth of a child, named MSC-DP. The analysis of the main characteristics was carried out on 6^{th} and 25^{th} passages. In the process of long-term cultivation gradually increases the proportion of senescence cells according to the activity of β-galactosidase. The 25th passage significantly increases the expression of the CD264 marker in comparison with the earlier passages, the increased level of which also characterizes cells that have entered the active phase of replicative senescence. The plating efficiency of cells of MSC-DP significantly decreases during long-term cultivation. Growth curves indicate active cell line proliferation on the 6^{th} passage and a significant decrease in the proliferation index on the 25^{th} passage. Karyotypic analysis carried out on the 6^{th} and 25^{th} passages showed the presence of normal human karyotype, 46, XX. Significant differences in karyotypic structure between 6^{th} and 25^{th} passage associated with the presence of a significant number dicentrics chromosome-type telomere associations in the later passage. The predominant participation in the formation of telomeric associations of the long arm of the chromosome 14 was found. On the 6^{th} and 25^{th} passages the expression of surface antigens typical for human MSCS (CD44, CD73, CD90, CD105, HLA-ABC) and the absence of expression of CD34, CD45, HLA-DR were revealed. The marker of undifferentiated human embryonic stem cells (ESC) — SSEA-4 is expressed only on the 6^{th} passage. The expression of markers of early differentiation ESC in the derivatives of the 3 germ layers was shown for cells of MSC-DP line. Cells of the MSC-DP line have the ability to differentiate in the osteogenic and chondrogenic directions. Expression of the neuronal differentiation gene is shown in confirmation of the ability of the MSC-DP line to multipotent differentiation. Overall, the presented results confirm the status of MSCs for the derived line and indicate significant changes occurring in the process of replicative senescence.

K e y w o r d s: human mesenchymal stem cells, proliferation, replicative senescence, surface cell markers, karyotype, telomeric associations, differentiation