Characterization of the expression of DZIP1 and PUM2 in Human Adult mesenchymal Stem Cells during the process of cellular differentiation

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Adult Mesenchymal Stem Cells (MSCs) have the potential of differentiating into several cellular types, serving as a repair system for the organism. When a MSC divides, it keeps the same potential of the original cell in a mechanism known as self-renewal. The understanding of this mechanism will help to overcome the adverse effects of senescence and hence, the loss of MSCs differentiation potential. PUMILIO2 and DZIP1 RNA binding proteins regulate the translation of specific mRNAs during self-renewal and differentiation of germ-line stem cells and embryonic stem cells of diverse organisms, including humans. In this work, we aimed to study the relationship of PUM2 and DZIP1 in the mechanisms of self-renewal of hMSCs. Using RT-PCR analysis, we observed the expression of PUM2 and DZIP1 transcripts in hMSCs derived from bone marrow (BM), adipose tissue (AD) and umbilical cord blood (UC). The presence of the PUM2 and DZIP1 proteins was confirmed by western blot of total protein extracts of hMSCs. Immunofluorescence assays using a specific antiserum against de DZIP1 protein showed the distribution of the protein in cytoplasmic granules. The expression pattern of the PUM2 and DZIP1 transcripts was followed during differentiation of adipose derived MSCs into adipocytes. Quantitative PCR analysis showed that mRNA levels of both genes drop during differentiation, in an opposite pattern of the aP2 adipocyte marker. We are currently analyzing the importance of these RNA binding proteins in the control of the undifferentiated state.
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