Gene Expression of Stanniocalcin-1 Transcripts During Differentiation of Human Adipose Derived Stem Cells

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The molecular mechanisms involved in the differentiation of human adipose derived stem cells (hADSCs) may contribute to the development of therapeutic tools and expand the use of these cells in tissue regeneration. Stanniocalcina-1 (STC1) is a protein originally characterized in fish as an important factor in the regulation of extracellular calcium levels. This gene was highly conserved during metazoan evolution. The protein coded by stc1 gene is present in tissues such as bone, kidney, ovary, testis, brain, and thyroid and it has been hypothesized that STC1 may have an important role in bone development in mammals. Searches performed on the human genome project sequence assembly available from ENSEMBL.org and on the ASPicDB splicing prediction database revealed the existence of a single stc1 gene but predicted a variety of splicing forms. The objective of this study was evaluate the mRNA expression of two predicted transcripts of stc1 in hADSCs. The cells were isolated from lipoaspirate and maintained undifferentiated or differentiated into osteoblast cells by 7 and 14 days. The two predicted transcripts (stc1-a and stc1-b) were successfully amplified, cloned and sequenced to confirm its identities. The two isolated isoform differs by the absence of the signal peptide and the pro-peptide sequences in stc1-b suggesting that this transcript is retained within the cell whereas stc1-a can be secreted, as usually occurs with STC1. q-PCR analyses demonstrated that the expression of the stc1-a is the most abundant during osteogenic differentiation of hADSCs.

Word Keys: Stanniocalcin-1, human adipose derived stem cells, osteoblasts, mRNA splicing

Supported by: FAPERGS, INCT-EN, CNPq and CAPES.