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Adipose derived stem cells: Cancerous and paracrine activity

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The use of adipose derived mesenchymal stem cells in regenerative medicine is in rise due to their plasticity, their capacity of differentiation, their paracrine and trophic effects. Adipose derived stem cells (AD-MSC) have been proven to have the same characteristics as bone marrow derived stem cells; nonetheless the harvesting of fat is minimally invasive with insignificant donor site morbidity and a low complication rate. The number of stem cells in fat is higher; it has been reported to be 100 to 1000 times more with higher proliferation rate and less senescence compared to bone marrow. Despite the large number of cells obtained from adipose tissue, it is usually not enough for therapeutic efficiency in many diseases and even sometimes for plastic surgery uses such as stretch marks, burns or skin lesions where the need for culturing and expanding the cells *in vitro* for several weeks. Our objective is to investigate the stemness and the immunomodulatory activity of synovial vascular fraction (SVF) and serial passaged adipose derived stem cells (ADSC) versus their potential tumorigenic activity ADSC were isolated, purified and cultured *in vitro* from lipoaspirates using a well-established protocol. The immunophenotypic properties (SVF) and serial passaged ADSC (P0-P4) were observed by flow cytometry. In parallel, we have compared the telomerase activity, the aldehyde dehydrogenase activity and the relative expression of hTERT, C-MYC and the nucleotide sequence of p53 through passages. We have also analyzed the cytokines secretion profile of ADSC during passages was a by ELISA kits. The telomerase activity was low in SVF and non-increased during P0 to P4 although it always decreases at day 21 during each passage. Aldehyde dehydrogenase was detected in SVF with no changes with serial passages. The relative expression of hTERT was not detected and that for C-MYC decrease significantly. A SNP was detected at the nucleotide 417 where C is substituted by G. The level of PGE2, STC1, TIMP1 and TIMP2 was not affected through passages. Our results suggest that the expansion of ADSC does not affect the differentiation capacity of stem cells and do not confer to cells a cancerous state or capacity.

Biography

Oula El Atat has completed her MSc from the Lebanese University, Doctoral School of Science and Technology. Currently, she is a PhD student at the Regenerative Medicine and Inflammation lab, Faculty of Medicine, Saint Joseph University, Lebanon.

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