

Biological Similarities Among Umbilical Cord Vein and Bone Marrow-Derived Mesenchymal Stem Cells

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Adult bone marrow (BM) is the major source of Mesenchymal stem cell for cell therapy. However, aspiration of BM has been regarded less efficient and invasive procedures. More recently, MSC has been isolated from human umbilical cord vein (UCV), which could be considered an attractive source for regenerative medicine. In order, this work aims at comparison of the biological characteristics between MSC derived from UCV (UCV-MSC) and MSC derived from BM (BM-MSC). The study showed that UCV-MSC presented the most of characteristic of BM-MSCs, including fibroblastic-like morphology, immunophenotype profile, cell cycle status, adipogenic, chondrogenic and osteogenic differentiation potentials and standard karyotype. Growth kinetics reported a similar proliferation capacity with a population doubling of $19,92 \pm 1,93$ to BM-MSC and $18,86 \pm 3,72$ to UCV-MSC ($p > 0,05$). Flow-FISH analysis also demonstrated that the telomere length in UCV-MSC was $14,41 \pm 1,7$ Kb and in BM-MSC was $12,28 \pm 1,18$ Kb ($p > 0,05$). Furthermore, in comparison with BM-MSC, the UCV-MSC possesses a similar *in vivo* pro-angiogenic potential, characterized by histological analysis of the micro-vessel density ($9 \pm 5,09$ vessel/area to UCV-MSC and $7,37 \pm 2,82$ vessel/area to BM-MSC, $p > 0,05$). Finally, the analysis of the expression level of several genes by real time RT-PCR showed some differences between these two cell types which could be explained by their origin. All together, this study demonstrated the great biological similarities between BM-MSC and UCV-MSC which suggest the potential of UCV-MSC to be an alternative source of MSC for stem cell therapies.