

Essential/nonessential amino acid compositions can modulate the proliferation of mesenchymal stem cells

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Mesenchymal stem cells (MSCs) comprise a rare population of multipotent progenitors capable of supporting hematopoiesis and differentiating into three (osteogenic, adipogenic, and chondrogenic) or more (myogenic, cardiomyogenic, etc.) lineages. Due to this ability, MSCs appear to be an attractive tool in the context of tissue engineering and cell-based therapy. Bone marrow and umbilical cord represents the main source of MSCs for both experimental and clinical studies. Currently, the stimulatory effects of various nutrients upon the growth rate of cells in vitro have been investigated extensively. In this study, we evaluated the effects of essential/nonessential amino acid on the proliferation of MSCs originated from bone marrow and umbilical cord. Both MSCs were seeded at a density of 2.5×10^3 cells/cm² and cultured in various amino acid compositions for eight days. And MTT, LDH, FACS, morphology analyses were performed. As a result, amino acid composition could modulate the proliferation of MSCs but the degree of effect was dependent on the cell sources.