

The effect of L-ascorbate 2-phosphate on the proliferation and differentiation of mesenchymal stem cells

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Abstract

Bone marrow contains multipotent mesenchymal stem cells (MSCs) that can differentiate into different mesenchymal lineages whose end-stage cells fabricate bone, cartilage, tendon, fat, and other connective tissues. Undifferentiated MSCs do not express immunologically relevant cell surface markers and represent a promising strategy for cell therapy. Thus MSCs have a great therapeutic potential resulting from their ability to differentiate into multiple tissues when cultured under specific conditions. It is reported that antioxidants, such as L-ascorbic acid is usually used to expand MSCs without the loss of differentiation potency. But some investigator reported that L-ascorbic acid is a potent factor inducing the expression of smooth muscle-specific marker genes in a pluripotent stromal cell line or stimulating the proliferation without the loss of phenotype and differentiation potency reciprocally.

The aim of this study was to evaluate the effects of L-ascorbate 2-phosphate on the proliferation and differentiation and ECM secretion of MSCs.

MSCs were seeded at a density of 2.5×10^3 cells/cm² and cultured with media containing 0, 5, 50, 250, 500 μ M L-ascorbate 2-phosphate for eight days. And MTT assay, FASC analysis and morphology analysis were performed. In conclusion, the results demonstrated that proliferation or differentiation of MSCs depend on the concentration of L-ascorbate 2-phosphate.

Reference

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2. Lin TM et al, Accelerated growth and prolonged lifespan of adipose tissue-derived human mesenchymal stem cells in a medium using reduced calcium and antioxidants(2005), Stem Cells Dev, 1:92-102.