Effect of medium composition on the proliferation and differentiation of human periodontal ligament fibroblasts

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Abstract

The periodontal ligament (PDL) is a soft connective tissue between the cementum and the inner wall of the alveolar bone socket to sustain and help constrain teeth within the jaw. PDL plays a crucial role in supporting teeth as well as contributing to tooth nutrition, homeostasis, and repair of damaged tissue. PDL contains heterogeneous cell populations that can differentiate into either cementum-forming cell or bone-forming cells [1]. But the effect of supplements on PDL fibroblasts *in vitro* is not yet explained.

So we tried to find out the proliferation and differentiation of the PDL fibroblasts depending on medium composition. PDL fibroblasts were obtained by collagenase and trypsin enzymatic digestion and then cultivated with αMEM supplemented with 10% fetal bovine serum, 100 μM ascorbic acid, 2 mM glutamine, 100 U/ml penicillin, 100 μg/ml steptomycin. And PDL fibroblasts were divided into three culture groups, 1) culture fortified with amino acid, 2) culture fortified with vitamin, and 3) culture fortified with amino acid and vitamin.

As results, fortification of amino acid or vitamin to PDL fibroblast culture was superior to control culture in aspect of proliferation and differentiation.

Reference

1. Seo BM, Miura M, Gronthos S, Barthold MP, Batouli S, Brahim J, Young M, Robey PG, Wang CY, Shi S (2004), Investigation of multipotent postnatal stem cells from human periodontal ligament, LANCET 364, 149-155.