

Final Report

**Dentine sialophosphoprotein expression, mineralized nodule
formation and attachment on chitosan of primary pulpal
fibroblasts**

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ABSTRACT

Aim: This study aimed to investigate the capability of primary pulpal fibroblasts, gingival fibroblasts (negative control) and MG-63 osteoblast cell line (negative control) that cultivated under inductive medium to form mineralized nodule and to express dentine sialophosphoprotein (DSPP). Cell attached on chitosan sheet was also studied.

Materials and Methods: The inductive medium was used to induce mineralized nodule formation of primary pulpal fibroblasts, gingival fibroblasts and MG-63 osteoblast cell line at 14, 21 and 28 days. The mineralized matrix formation was identified by Alizarin Red S staining. DSPP expression was identified by reverse transcription of polymerase chain reaction at 0, 7 and 21 days. Primary pulpal fibroblasts, gingival fibroblasts and MG-63 were seeded on chitosan sheet. After 24 hours cultured on chitosan sheet, cell attachment and growth were monitored and compared. All cells were fixed with formaldehyde and stained with 0.4%Tryphan blue. The morphology of cells was analyzed under light microscope.

Result: The mineralized nodules were found in all cell groups. The mineralized nodules increased along the point of times in primary pulpal fibroblasts and MG-63 osteoblast cell line. Gingival fibroblasts had less nodule formation at the period of 14 and 21 days than 28 days. DSPP expression could not be detected in all cells groups at all-time point. The morphology of cell plated on the chitosan appeared rounder than non-chitosan coated wells. The number of primary pulpal fibroblasts after 24 hours culture was more than gingival fibroblasts and MG-63 osteoblast cell line on chitosan and non-chitosan coated wells.

Conclusion: Our results demonstrated that primary pulpal fibroblasts, gingival fibroblasts and osteoblast cell line MG-63 can form mineralized nodule under inductive condition but do

not expressed DSPP. Primary pulpal fibroblasts had higher cell attachment than gingival fibroblasts and osteoblast cell line MG-63 after 24 hours of cell cultivation.

Keywords: primary pulpal fibroblasts, gingival fibroblasts, MG-63, mineralized nodule, dentine sialophosphoprotein, chitosan