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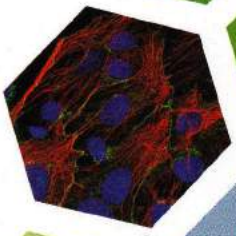

Program & Abstracts

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Abstract No. P024

The interaction between gingival gibroblast and periodontal ligment stem cells on expression of periodontal markers and osteogenic capacity in vitro

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Objectives: Periodontal ligament stem cells (PDLSCs) have the characteristics of mesenchymal stem cells and are a potential source of cells for regeneration of the periodontal tissues. Periodontal regeneration may depend on the interaction of adjacent cell populations within the tissues such as gingival fibroblasts (GFs). The aims of this study were to investigate the effects of PDLSC on the expression of periodontal markers and osteogenic differentiation of GFs. Materials and methods: Primary human PDLSCs isolated from extracted third molars were co-cultured with primary GF cultures, by direct co-culture with subsequent FACS sorting, indirect co-culture using transwell cultures and PDLSC conditioned medium. The expressions of periodontal markers PLAP, Nestin and Periostin were assessed by qPCR. Alkaline phosphatase activity was assessed by para-nitrophenol enzymatic assay. Single cultures of PDLSC and GF were used as controls Results: PDLSC induced expression of PDL markers in GFs in both direct and indirect coculture methods (EG increases of 6.05 and 59.48 fold of PLAP expression $p<0.05$). PDLSC co- cultures,at a ratio of 1PDLSC: 3GF also resulted in increased ALP activity in GF when compared with single GF cultures ($p<0.001$). Similar results were seen using conditioned medium isolated from PDLSC cultures. Conclusions: PDLSCs stimulate expression of periodontal markers and osteogenic capacity of gingival fibroblasts via a mechanism involving paracrine signalling. The results demonstrate that GF contains MSC-like cells which may be recruited for periodontal regeneration by the action of PDLSC cells. Further studies are required to identify specific secreted factors responsible for this activity.

Keywords: periodontal stem cells, co-culture, cell signalling