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pPKCα mediates integrin β1 induced PGE_2 production in a TEGDMA treated HGFs/S. mitis/saliva co-culture system

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Among the molecules expressed at plasma membrane level in human gingival fibroblasts (HGFs), integrins, heterodimeric transmembrane proteins able to bind a variey of extracellular ligands as well as intracellular proteins which play an important role in cell signaling, are represented. It was recently demonstrated (di Giacomo et al, 2013) that integrin β1 regulates, through pPKCα HGFs and Streptococcus mitis adhesion in response to hydroxyethil metachrylate, a resin monomer common in bonding materials and resin-enforced glassionomer cements. In the present study we treated HGFs co-cultured with S. mitis, an oral commensal, and saliva with TEGDMA (tetraethyleneglycol dimethacrylate), a common monomer in composite and bonding. The aim of this work is to evaluate interaction occurring between biomaterial, host tissue and microbial environment. The presence of S. mitis and saliva increases integrin β 1 membrane expression, PKCα activation and PGE_2 production with a major extent in TEGDMA treated sample. On the other hand, erk activation seems to be downregulated in the same experimental conditions. Since it was recently demonstrated a protective role exerted by S. mitis and saliva on HGFs against biomaterial cytotoxicity, and being demonstrated a physiological role for fibroblasts released PGE_2 in other experimental systems (Skibinski et al, 2007), we suggest a non-inflammatoryl role for PGE_2 production induced by HGFs/S.mitis and saliva interaction. These results, shedding more light on the biological and molecular events that occur upon TEGDMA treatment in vitro in a co-culture model that mimics the environment of the oral cavity, confirm the key role played by oral environment in HGFs' response to exogen stimuli.

References

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Key words

Human gingival fibroblasts, PKCα activation, integrin, co-culture, PGE_2.