Impairment of Gingival Fibroblast Adherence by IL-6/sIL-6R

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Abstract

Interleukin-6 (IL-6) binds to human gingival fibroblasts (HGF) in the presence of a soluble form of IL-6 receptor (sIL-6R). We investigated the effects of IL-6 on the functions of HGF in the presence of sIL-6R. HGF changed their morphology from spindle-shaped to round, and detached from the culture dish by stimulation with IL-6/sIL-6R. In this condition, a signal transducer gpl30 and a transcription factor Stat3 were phosphorylated, resulting in activation of transcription factors Stat3 and C/EBPβ. Cytoskeletal β-actin and adhesion molecule integrin-a5, a subunit of 5β1 integrin (VLA-5), were found to possess potential binding domains for these transcription factors in their promoters. Accumulation of (3-actin and integrin-a5 mRNA decreased, contrary to the expectation of the induction of gene transcription. Furthermore, the decrease in their mRNAs was associated with reduced expression of both actin and VLA-5 proteins. These results suggest that the expression of VLA-5 and actin was down-regulated in HGF through an IL-6 signaling pathway, resulting in impairment of HGF adherence.