

Platelet-rich plasma stimulates osteoblastic differentiation in the presence of BMPs

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Abstract

Platelet-rich plasma (PRP) is clinically used as an autologous blood product to stimulate bone formation in vivo. In the present study, we examined the effects of PRP on proliferation and osteoblast differentiation in vitro in the presence of bone morphogenetic proteins (BMPs). PRP and its soluble fraction stimulated osteoblastic differentiation of myoblasts and osteoblastic cells in the presence of BMP-2, BMP-4, BMP-6 or BMP-7. The soluble PRP fraction stimulated osteoblastic differentiation in 3D cultures using scaffolds made of collagen or hydroxyapatite. Moreover, heparin-binding fractions obtained from serum also stimulated osteoblastic differentiation in the presence of BMP-4. These results suggested that platelets contain not only growth factors for proliferation but also novel potentiator(s) for BMP-dependent osteoblastic differentiation.

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