Diversity of bone matrix adhesion proteins modulates osteoblast attachment and organization of actin cytoskeleton.

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Résumé en anglais	Interaction of cells with extracellular matrix is an essential event for differentiation, proliferation and activity of osteoblasts. In bone, binding of osteoblasts to bone matrix is required to determine specific activities of the cells and to synthesize matrix bone proteins. Integrins are the major cell receptors involved in the cell linkage to matrix proteins such as fibronectin, type I collagen and vitronectin, via the RGD-sequences. In this study, cultures of osteoblast-like cells (Saos-2) were done on coated glass coverslips in various culture conditions: DMEM alone or DMEM supplemented with poly-L-lysine (PL), fetal calf serum (FCS), fibronectin (FN), vitronectin (VN) and type I collagen (Col-I). The aim of the study was to determine the specific effect of these bone matrix proteins on cell adherence and morphology and on the cytoskeleton status. Morphological characteristics of cultured cells were studied using scanning electron microscopy and image analysis. The heterogeneity of cytoskeleton was studied using fractal analysis (skyscrapers and blanket algorithms) after specific preparation of cells to expose the cytoskeleton. FAK and MAPK signaling pathways were studied by western blotting in these various culture conditions. Results demonstrated that cell adhesion was reduced with PL and VN after 240 min. After 60 min of adhesion, cytoskeleton organization was enhanced with FN, VN and Col-I. No difference in FAK phosphorylation was observed but MAPK phosphorylation was modulated by specific adhesion on extracellular proteins. These results indicate that culture conditions modulate cell adhesion, cytoskeleton organization and intracellular protein pathways according to extracellular proteins present for adhesion.
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