



# Proliferation and differentiation of human osteoblasts from a type 2 diabetic patient *in vitro*

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**ABSTRACT.** We investigated the proliferation and differentiation potential of human osteoblasts from a type 2 diabetic patient *in vitro*. Human osteoblasts were obtained from a healthy subject and a type 2 diabetic patient and were cultured *in vitro* using the tissue explant adherent method. Differences in cell morphology were observed under a phase contrast microscope. The osteogenic differentiation capacity was evaluated by alizarin red staining, 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay, alkaline phosphatase (ALP) staining, and detection of bone Gla-protein (BGP) and Col-1. Expression of Runx-2 and Col-1 was detected using RT-PCR and western blot. Our data indicated that alveolar bone osteoblasts from the type 2 diabetic patient exhibited poorer growth, smaller calcium nodule formation, slower proliferation, and lower ALP, BGP, and Col-1 concentrations in the cell culture supernatant, as compared to control

cells ( $P < 0.05$ ). Combined, our study indicated that alveolar bone osteoblasts from a type 2 diabetic patient exhibited slower proliferation and decreased differentiation, as compared to healthy control, when cultured *in vitro*.

**Key words:** Type 2 diabetes; Alveolar bone; Osteoblast; Osteoblast proliferation and differentiation