

## Low-Level Laser Irradiation Promotes Proliferation and Differentiation of Human Osteoblasts *in Vitro*

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**Objectives:** The aim of the present study was to investigate the effect of low-level laser irradiation on proliferation and differentiation of a human osteoblast cell line. **Background data:** It was previously found that lowlevel laser therapy (LLLT) enhances bone repair in experimental models. **Materials and methods:** Cultured osteoblast cells were irradiated using He-Ne laser irradiation (632 nm; 10 mW power output). On the second and third day after seeding the osteoblasts were exposed to laser irradiation. The effect of irradiation on osteoblast proliferation was quantified by cell count and colorimetric MTT (dimethylthiazol tetrazolium bromide) assay 24 and 48 h after second irradiation. **Results:** A significant 31–58% increase in cell survival (MTT assay) and higher cell count in the once-irradiated as compared to nonirradiated cells was monitored. Differentiation and maturation of the cells was followed by osteogenic markers: alkaline phosphatase (ALP), osteopontin (OP), and bone sialoprotein (BSP). A two-fold enhancement of ALP activity and expression of OP and BSP was much higher in the irradiated cells as compared to non-irradiated osteoblasts. **Conclusion:** We conclude that LLLT promotes proliferation and maturation of human osteoblasts *in vitro*. These results may have clinical implications.

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