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Effect of a diode laser on cell proliferation, alkaline phosphatase activity, and osteopontin mRNA expression in proliferating and in differentiating osteoblastic cells

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ABSTRACT

Different types of osteoblast behavior result from external stimulation in the early and in the late stages of cell differentiation. The purpose of this study was to investigate the influence of a diode laser on osteoblasts and to compare any effects between the proliferating and the differentiating phases. In the proliferating phases, the numbers of cells greatly increased in the laser irradiated group as compared with that of the control group. The increases in the numbers of cells in the differentiating phase were no greater than were those in the proliferating phase. The alkaline phosphatase activity of cells in the proliferating phase was highest 5 days after the laser irradiation, however, the activity in the differentiating phase

increased day by day. Although osteopontin mRNA levels in the proliferating phase increased in the first 3 days of culture and then decreased in both groups, this decrease of osteopontin mRNA was small in the irradiated group. In contrast, osteopontin mRNA expression in the differentiating phase increased at day 1 and then decreased in the control group, while osteopontin mRNA levels in the irradiated group did not decrease.

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