

# Abstract

Biochem Pharmacol. 1986 Mar 1;35(5):773-7.

## Action of zinc on bone metabolism in rats. Increases in alkaline phosphatase activity and DNA content.

Yamaguchi M, Yamaguchi R.

**OBJECTIVE AND METHODS:** The effects of zinc on the enzymes of femoral tissue were investigated in weanling rats that had been given zinc sulfate (1.0 mg Zn<sup>2+</sup>/100 g body wt) p.o. for 3 days.

**RESULTS:** Administration of zinc caused a marked elevation of alkaline phosphatase and acid phosphatase activities, whereas it did not cause significant changes in succinate dehydrogenase, 5'-nucleotidase, ATPase, pyrophosphatase and beta-N-acetylglucosaminidase activities. The effect of zinc was greater on alkaline phosphatase of the femoral diaphysis. Zinc content of the femoral diaphysis was raised significantly by administration of zinc. The addition of zinc in concentrations of 10(-2)-10(2) microM did not produce a significant increase in alkaline phosphatase activity in the femoral diaphysis, indicating that zinc could not activate the enzyme. Administration of cycloheximide or actinomycin D completely inhibited the increase in alkaline phosphatase activity produced by administration of zinc. DNA content of the femoral diaphysis, but not epiphysis, was increased markedly by administration of zinc. The increases in both alkaline phosphatase activity and DNA content of the femoral diaphysis were not caused by administration of copper, manganese, cobalt, nickel and chromium(III).

**CONCLUSIONS:** The present investigation suggests that zinc may induce the increase in alkaline phosphatase related to DNA synthesis and, as a result, stimulate bone growth.

PMID: 3954786

