

Effects of zinc on structural characteristics of proteoglycans synthesized by proliferating and hypertrophic chondrocytes in culture

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Zinc (Zn) supplementation has been shown to stimulate longitudinal growth under marginal nutritional status. The mechanisms by which Zn stimulates longitudinal growth are still unknown. We have previously investigated the effects of Zn on proliferation and proteoglycan (PG) synthesis on epiphyseal chondrocytes. In this study we report the effects of Zn on structural characteristics of the PG synthesized by cultured chondrocytes. Chicken chondrocytes were cultured in a serum-free medium, supplemented ZnCl₂ (0-1 nM). PG were labeled with ³⁵S³⁵SO₄, and characterized by ion-exchange and molecular sieve chromatography, and by their sensitivity to enzymatic treatment. PG synthesized by hypertrophic chondrocytes in the presence or absence of Zn exhibited similar structural characteristics. In contrast. PG synthesized by proliferating chondrocytes in the presence of Zn show higher mean charge density, and lower hydrodynamic size than those synthesized in the absence of Zn. The composition and hyd