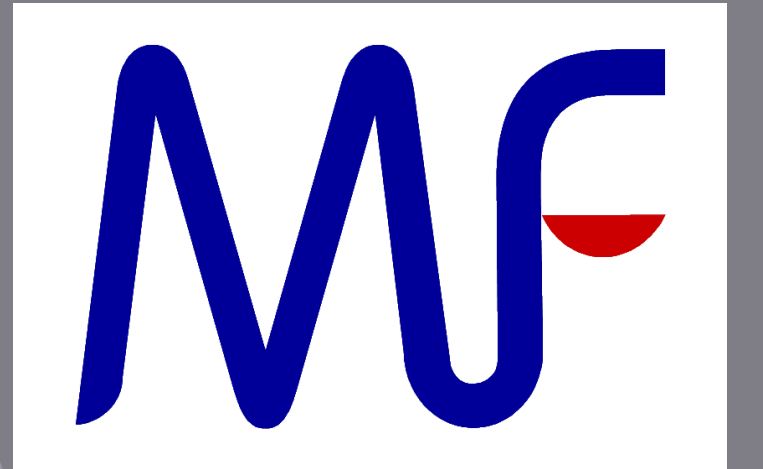




GROWTH PLATE AND TRABECULAR BONE HISTOMORPHOMETRY IN WILD TYPE AND TFF3 KNOCK OUT MICE



IVANA LOVRIĆ¹, DUNJA STOLNIK², NIKOLA BIJELIĆ¹, TATJANA BELOVARI¹ AND MIRELA BAUS LONČAR³

¹ Department of Histology and Embryology, Faculty of Medicine, University of Osijek, J.Huttlera 4, 31000 Osijek, Croatia

² Clinical Hospital Centre Osijek, J. Huttlera 4, 31 000 Osijek, Croatia

³ Department of Molecular Medicine, Institute Ruđer Bošković, Bijenička 54, 10000 Zagreb, Croatia

INTRODUCTION

Tff3 peptide is present during intrauterine endochondral ossification in mice. Lack of Tff3 peptide in Tff3 knock-out mice affects histomorphometric parameters describing cancellous bone quality in secondary ossification centers of mouse tibiae, impairing bone formation. The aim of this study was to quantitatively analyze several parameters describing the growth plate and primary ossification centers in tibiae of one month old wild type and Tff3 knock-out mice.

MATERIALS AND METHODS

For the analysis of primary ossification centers, tibiae of one month old 5 wild type mice and 5 Tff3 knock-out mice were used. Three representative slides were used from each bone, hemalaun-eosine stained and analyzed. Digital photographs of bones were processed by open source computer programs Gimp and FIJI. Histomorphometric parameters describing growth plate were analyzed after staining with Masson's trichrome stain. Growth plate photographs were analysed by QuickPHOTO Pro software. Statistical software Statistica was used to perform Mann-Whitney U test.

RESULTS

Morphological analysis of the Tff3 knock-out mice bone showed significantly smaller trabecular number (Tb.N.) and significantly larger trabecular separation (Tb.Sp.), compared to the wild type mice. Trabecular bone volume (BV/TV), trabecular bone surface (BS/TV) and trabecular thickness showed no significant difference between wild type and knock out mice. No significant histomorphological differences between wild-type mice and Tff3 knockout mice were found in epiphyseal plate thickness, in the thickness of different zones of endochondral ossification, and in the chondrocyte density.

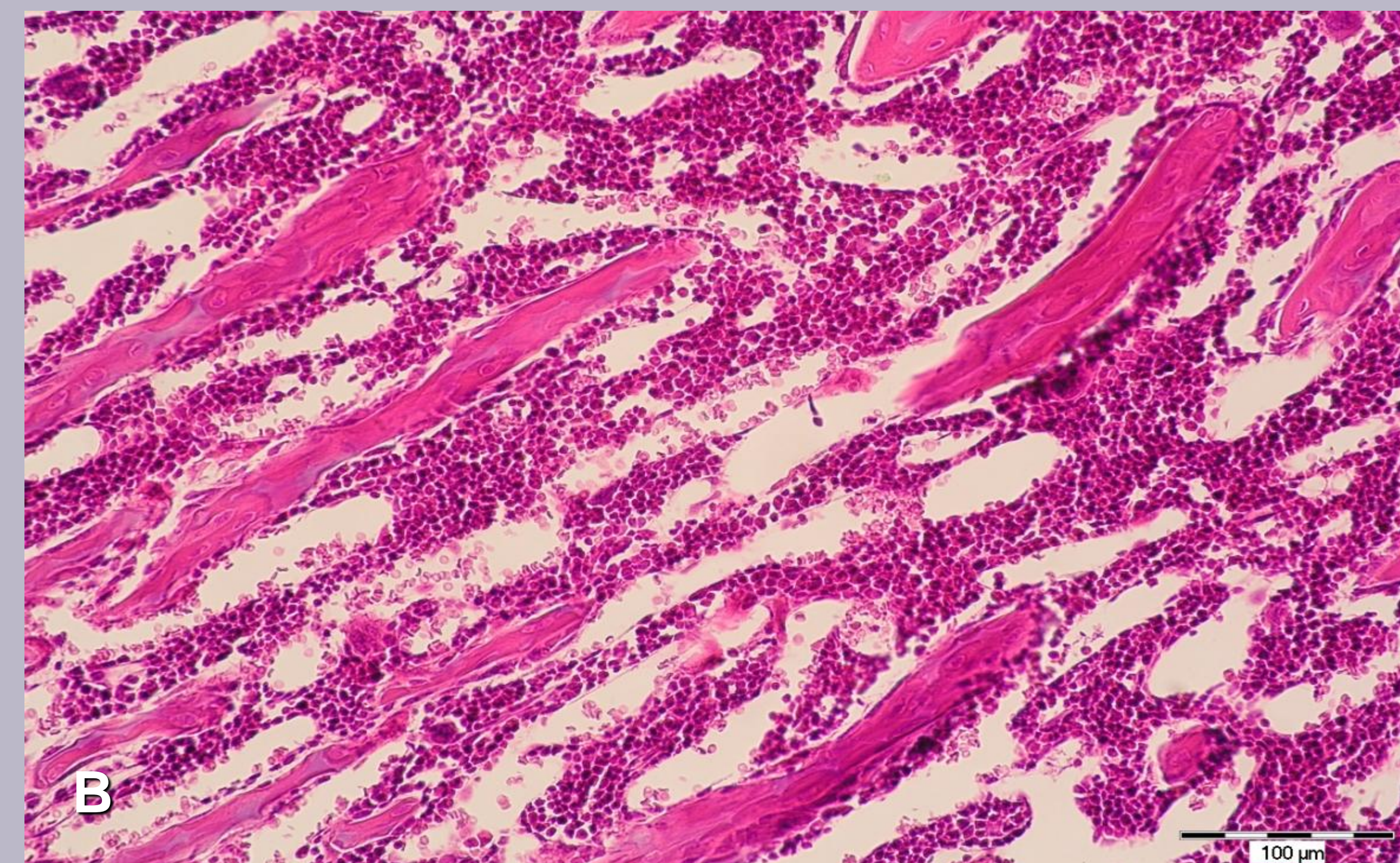
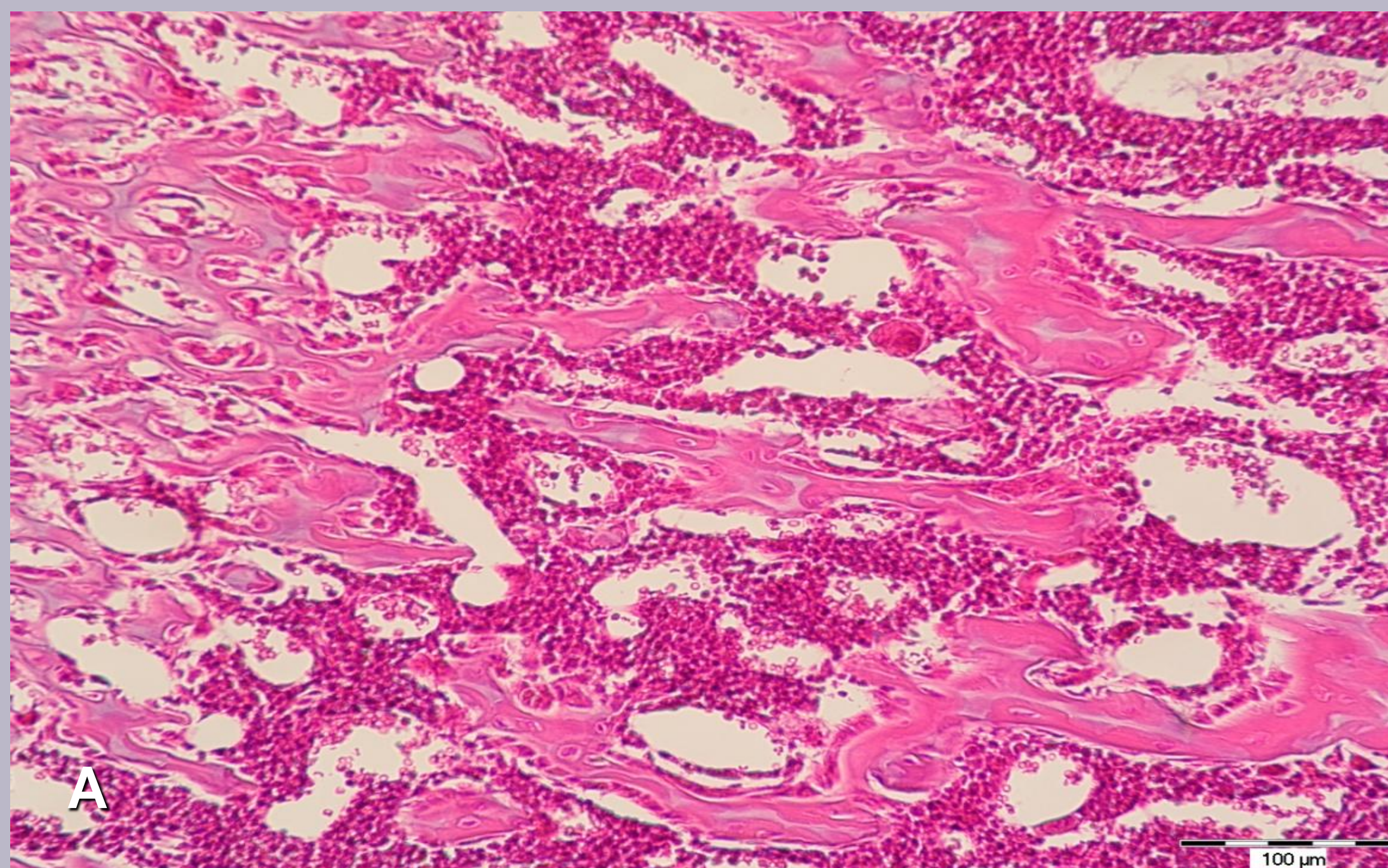


Image A. Trabecular bone in the proximal tibia of one month old wild type mouse. Stain: HE. (Scale bar: 100 μm).

Image B. Trabecular bone in the proximal tibia of one month old Tff3 knock-out mouse. Stain: HE. (Scale bar: 100 μm).

CONCLUSION

There are several histomorphological differences in bone structure between the wild type and the Tff3 knock-out mice. Tff3 probably has an effect on the formation and quality of the cancellous bone in the primary ossification centers. Further research might explain the extent of Tff3 influence on bone development and the function of epiphyseal plate.

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