Expression of trasncripts for fibroblast growth factor 18 and its possible receptors during postnatal dentin formation in rat molars

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Abstrak

Fibroblast growth factors (FGFs) regulate the proliferation and differentiation of various cells via their respective receptors (FGFRs). During the early stages of tooth development in fetal mice, FGFs and FGFRs have been shown to be expressed in dental epithelia and mesenchymal cells at the initial stages of odontogenesis and to regulate cell proliferation and differentiation. However, little is known about the expression patterns of FGFs in the advanced stages of tooth development. In the present study, we focused on FGF18 expression in the rat mandibular first molar (M1) during the postnatal crown and root formation stages. FGF18 signals by RT-PCR using cDNAs from M1 were very weak at postnatal day 5 and were significantly up-regulated at days 7, 9 and 15. Transcripts were undetectable by in situ hybridization (ISH) but could be detected by in situ RT-PCR in the differentiated odontoblasts and cells of the sub-odontoblastic layer in both crown and root portions of M1 at day 15. The transcripts of FGFR2c and FGFR3, possible candidate receptors of FGF18, were detected by RT-PCR and ISH in differentiated odontoblasts throughout postnatal development. These results suggest the continual involvement of FGF18 signaling in the regulation of odontoblasts during root formation where it may contribute to dentin matrix formation and/or mineralization.