Temporal and Spatial Expression of Matrix Metalloproteinase-17 (MT4-MMP) During Endochondral Ossification in Mice

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MMPs are zinc-dependent endopeptidases that, collectivelly, degrade all components of the extracellular matrix (ECM). The membrane-anchored MMPs (MT-MMP), containing an anchoring motif that facilitates to reach key membrane and peripheral proteins as well as closely associated ECM components thereby playing a pivotal role during alterations of the pericellular environment in both physiological and pathological conditions. Membrane insertion confers MT-MMPs with a unique set of regulatory mechanisms that serve to control the pool of active protease at the cell surface including endocytosis, recycling, autocatalytic processing, and ectodomain shedding. MMPs and their inhibitors (TIMPs and RECK) are responsable for bone matrix remodeling and, probably, determinate the level of its turnover. Since there are no studies evaluating the participation of MMP-17 ossification, we carried out the present study. Femurs (n=5/period) were collected from foetuses (E13-E20) and 1 day postnatal (PN1) performed by avidin-biotin-immunoperoxidase technique in formalin-fixed paraffin-embedded. At E13, chondrocytes was immunostained in chondrocyte differentiation site and in all hypertrophic chondrocytes in cartilaginous anlagen, at E14. During vascular and cellular invasion (E15), MMP-17 was immunolabeling at the center of cartilaginous anlagen in both proliferative and hypertrophic chondrocytes and osteoblasts-like. From E18 to PN1, the immunolocalization this enzyme was restrict to osteoblasts at the ossification front. All identified cells showed both cytoplasmic and membrane stain. Our results showed, for the first time, that MMP-17 is differentially expressed during endochondral ossification and it may be important to replacement of cartilaginous matrix by bone matrix and bone formation.

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