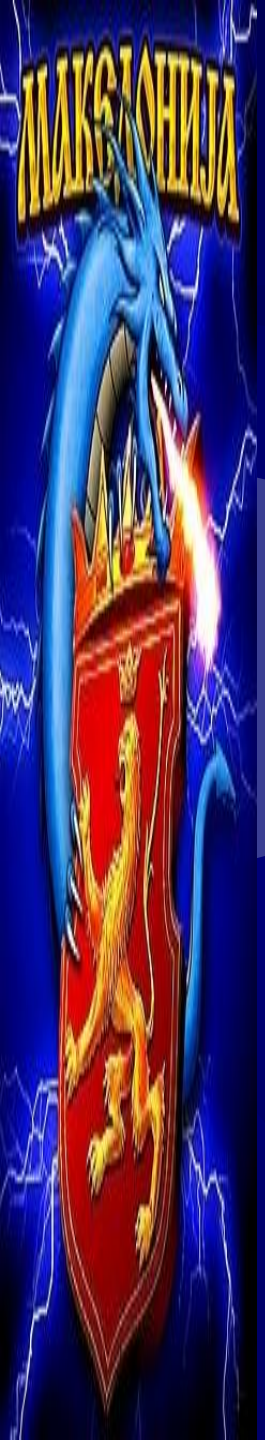

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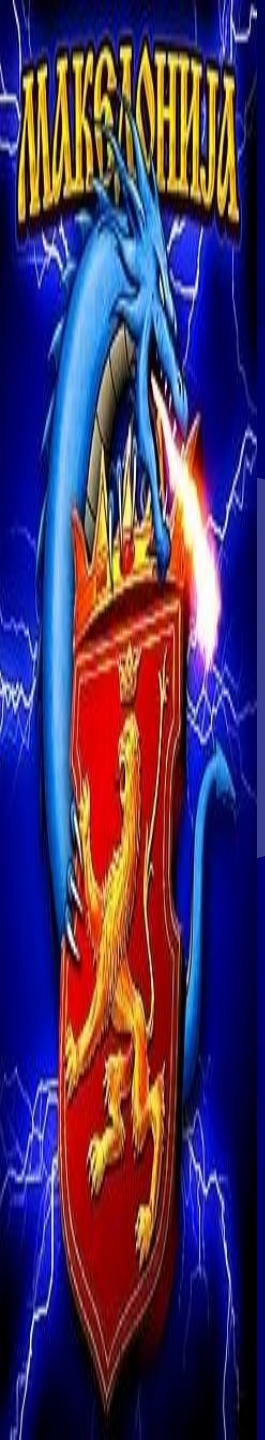
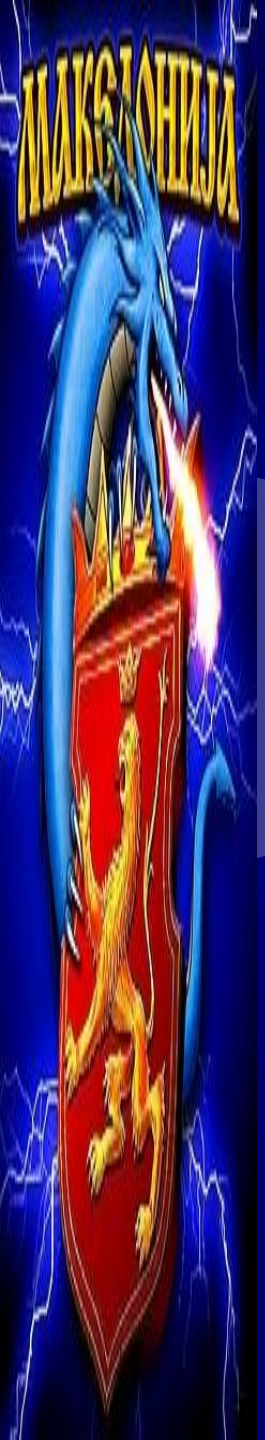
MATRIX METALLOPROTEINASE ACTIVITY IN NECIDUOUS DENTAL PULP

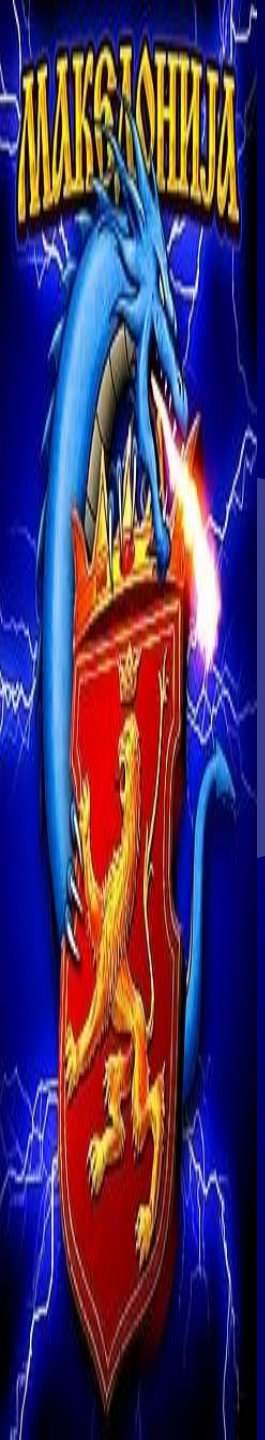
Georgiev Zlatko, Sotirovska-Ivkovska A, Kovacevska I, Dimovska C, Cekovska S.



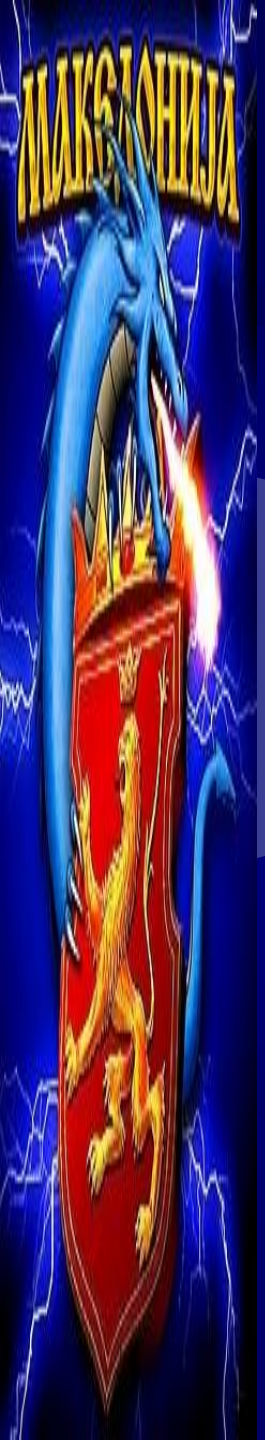
Deciduous teeth are a full value masticatory organ during the period of theirs limited, genetically determined life time.
Their role is complex, because it evolves in the most sensitive period in the life of every person - the period of intensive growth and development of the organism.



Deciduous teeth are formed in a much shorter period of time, contrary to permanent teeth, and after a relatively short and functional duration they go though an early physiological age, which in the noncarious deciduous teeth is manifested with a diminished pulp ability to produce a secondary dentine.

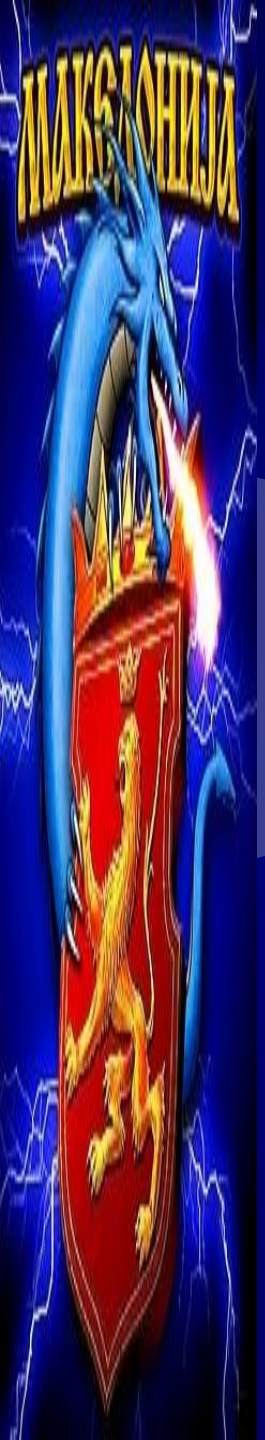


The pulp is the carrier of tooth vitality and in the children she is very reactive. From its reactive ability - defensive function, manifested through production of protective - tertiary dentine, as well as from its non-specific and specific defensive mechanisms, its survival basically depends by some pathological conditions. From that point, defensive pulp power investigation of the deciduous teeth always is a challenge for the researchers in this field, and it is also of an enormous clinical significance for the practitioners.

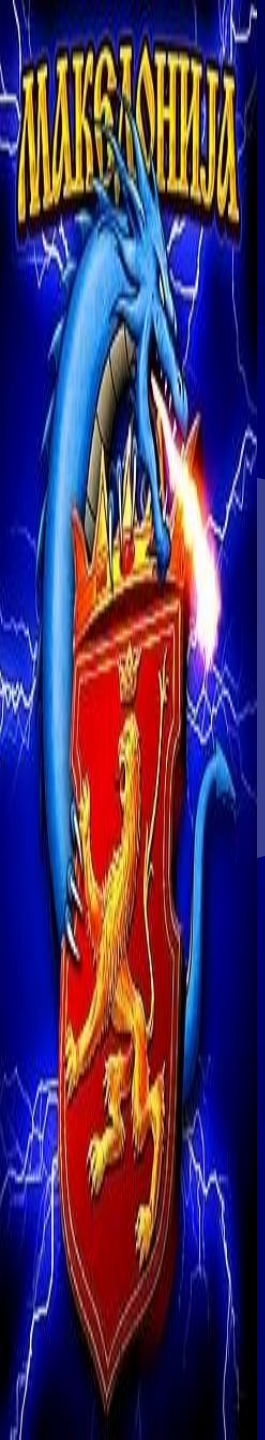


Extracellular matrix turnover is an event that is tightly regulated, and initiated at least in part, by the regulated secretion of members of a family of matrix metalloproteinases.

Much of the coordinate – physiological, or discoordinate - pathological degradation of the extracellular matrix is catalyzed by a class of proteases known as the matrix metalloproteinases.



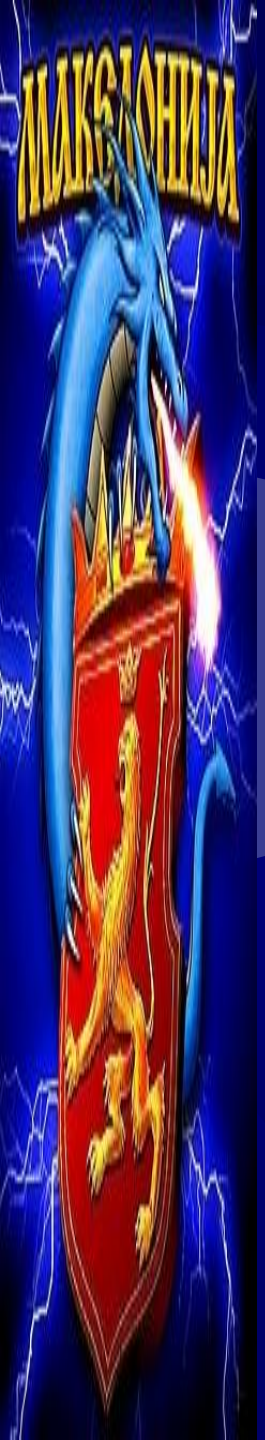
Matrix metalloproteinases constitute the major proteolytic enzyme group degrading the extracellular matrix components. They are involved in the remodeling of the connective tissue during normal biological processes. They are a family of homologous Zn atom dependent endopeptidases that are usually secreted from cells as inactive zymogens.



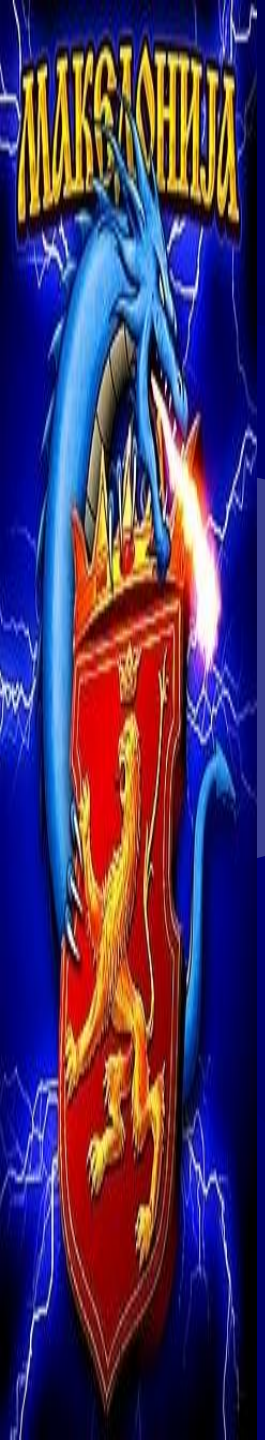
Matrix metalloproteinases are an important group of zinc enzymes responsible for degradation of the extracellular matrix components such as collagen and proteoglycans in normal embryogenesis and remodeling and in many disease processes such as arthritis, cancer, periodontitis, and osteoporosis.

A matrixin family is defined, comprising at least seven members that range in size from 28,000 to 92,000 daltons and are related in gene sequence to collagenase.

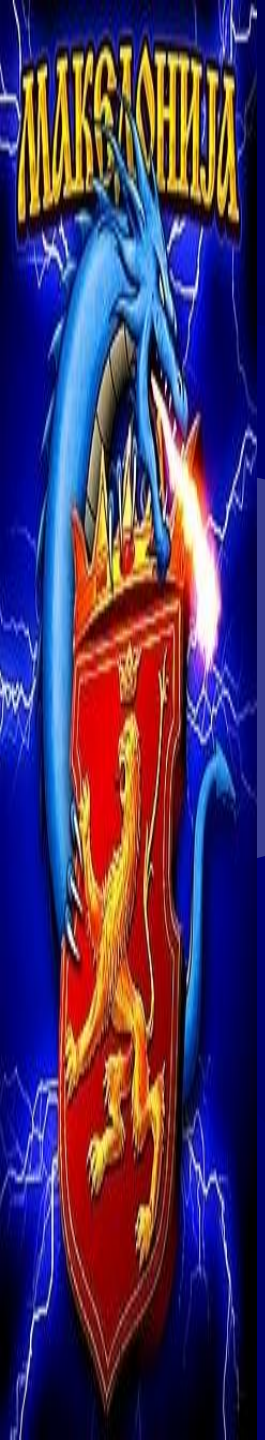
All family members are secreted as zymogens that lose peptides of about 10,000 daltons upon activation.



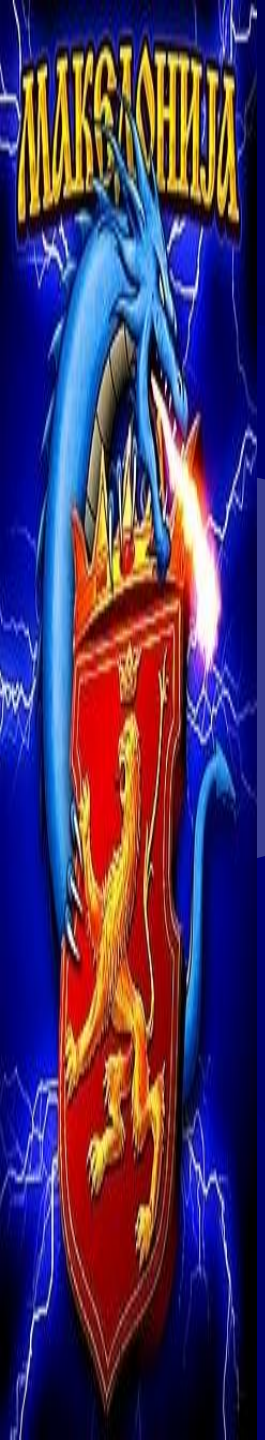
The MMP family currently consists of 24 members characterized in humans, rodents, and amphibians. Initially classified as zinc-dependent proteinases capable of digesting the various structural components of the extracellular matrix, their specific proteolytic targets have since expanded to many other extracellular proteins.



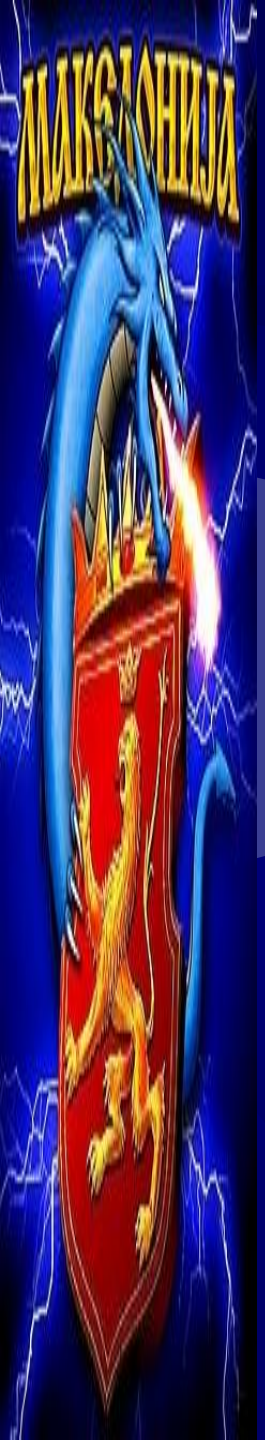
Matrix metalloproteinases play a dominant role in the degradation of the extracellular components in healthy deciduous dental pulp, such as collagens, in the processes of physiological matrix remodeling.



The neutrophils are the major cells responsible for MMP release at the infected site, specifically for MMP-8 (collagenase-2) and MMP-9 (gelatinase-B). Although MMP-8 is able to potently degrade interstitial collagens, MMP-9 degrades several extracellular matrix proteins. MMP-1, MMP-2, MMP-8, and MMP-9 were preferentially expressed in mononuclear and fibroblastic cells with low expression noted as in polymorphonuclears, and more than 50% of fibroblasts expressed MMP-1, MMP-2, and MMP-8 in healthy teeth.



Matrix metalloproteinases play a dominant role in the degradation of the extracellular components in healthy deciduous dental pulp, such as collagens, in the processes of physiological matrix remodeling.



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