Heterogeneity of MHC Class II Molecule-expressing Cells in Different Regions of Normal Rat Periodontal Ligament: Quantitative PCR Analysis of CD83, CD86 and Toll-like Receptor 4 mRNAs

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Abstract: We have recently reported that antigen presenting cells, such as dendritic cells and macrophages, showed different ultrastructural characteristics in different regions of normal rat molar periodontal ligament (PDL). Such morphological heterogeneity may be caused, at least in part, by different maturation/activation statuses of these cells due to region-specific microenvironmental conditions. In order to further understand the regional differences in the maturation/activation statuses of antigen presenting cells, in this study we performed real-time PCR analysis of MHC class II, CD83 (predict), CD86 and Toll-like receptor 4 mRNAs in furcal, mesial, distal and periapical regions of normal rat molar PDL. The results demonstrated that all the mRNAs examined were detected in all the regions. Expression levels were high in the furcal region, the area closest to the oral environment, and low in the periapical region. These findings support the notion that different regions of the PDL contain antigen presenting cells of different maturation/activation statuses, depending on microenvironmental differences, such as the degree of bacterial challenge.

Key words: Periodontal ligament, Antigen presenting cell, Real-time PCR