

DMP1 and DSP localization during *in vitro* odontoblast like cell differentiation

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The aim of this study was to analyze the temporal and spatial localization of dentin matrix protein 1 (DMP1) and dentin sialoprotein (DSP) in human dental pulp cells differentiated *in vitro* towards odontoblast-like cells.

Following to a notable injury to the tooth, the odontoblasts die and a new generation of odontoblast-like cells differentiate from pulp progenitor cells [1]. They are responsible for the secretion of the reparative dentin matrix.

In this study, morphological changes and the analysis of DMP1 and DSP were investigated starting from human dental pulp cells differentiated *in vitro*. Alizarin red staining, transmission and scanning electron microscopy in combination with Real Time PCR and immunofluorescence techniques were performed to demonstrate the odontoblast-differentiated phenotype and the specific expression and localization of DMP1 and DSP.

The results showed a gradual calcium deposition to demonstrate a mineralization matrix. Electron microscopy analysis showed fibroblast-like cells characterized by a large number of mitochondria and a developed rough endoplasmic reticulum and Golgi apparatus involved in intense protein synthesis. A large extracellular matrix was detectable in which collagen type I fibers were detected.

The DMP1 and DSP showed low expression and nuclear localization at the beginning of the odontoblast-like cell differentiation. After 21 days, elevated cytoplasm expression was detectable for both odontogenic markers.

References

[1] Goldberg M, Smith AJ. Crit Rev Oral Biol Med 2004; 15:13 – 27.

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