

## Distribution of DMP-1 and DSPP in human carious dentin: an immunohistochemical analysis

Alessandra Trirè<sup>1</sup>, Viviana Salvatore<sup>1</sup>, Fernando Nato<sup>1,2</sup>, Gabriella Teti<sup>1</sup>, Alessandra Ruggeri Jr<sup>1</sup>

<sup>1</sup> Department of SAU&FAL, University of Bologna, Italy

<sup>2</sup> Department of STeVA, University of Urbino, Italy

*Introduction.* To understand the mechanisms underlying dentin repair, several studies are focused on the analysis of the morphological aspects and chemical content of human carious dentin. Demineralization of dentin matrix causes a series of defensive reactions of the dentin-pulp complex to the carious stimuli, resulting in the formation of intratubular hypermineralized dentin (sclerotic dentin) towards the advancing front of the carious lesion and in the apposition of tertiary dentin within the pulp chamber.

The objective of this study was to investigate the immunohistochemical labeling patterns of dentin matrix protein-1 (DMP-1) and dentin sialophosphoprotein (DSPP), in human carious vs sound dentin matrix.

*Materials and Methods.* Carious and sound human teeth were fixed in 4% paraformaldehyde and then processed for embedding in a methylmethacrylate-based resin system. Sections of 100- to 150- $\mu$ m-thickness were exposed to a post-embedding immunolabelling procedure with anti-DMP-1 and anti-DSPP antibodies. An HRP-DAB-based detection system was used to detect the antigen-antibody binding sites by means of a light microscopy analysis.

*Results and Discussion.* Carious and sound dentin showed a positive immunoreactivity to both DMP-1 and DSPP antibodies. In particular DSPP and DMP-1 patterns were more intense in carious than in sound dentin. The detection of DSPP was higher in the predentin layer, while the colorimetric reaction for DMP-1 was more concentrated in the secondary dentin closer to predentin layer.

These results suggest that both DSPP and DMP-1 may play an important role in the dentin response to carious stimuli. In particular, these proteins might be involved in the hypermineralization of human dentin matrix in the sclerotic dentin portion.

**Keywords:** Key words: human dentin matrix, human dentin proteins, immunohistochemical analysis, human carious dentin, dentin repair.