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Reparative human dentin: immunohistochemical localization and quantification of Small Integrin-Binding LIgand N-linked Glycosproteins (SIBILINGs)

Desiree Martini[1], Gabriella Teti[1], Maria Menetti[1], Sandra Durante[2] and Alessandra Ruggeri[1]

[1] Università di Bologna, Dipartimento di Scienze Biomediche e Neuromotorie (DIBINEM), Bologna, Italia
[2] Università di Bologna, Giorgio Prodi Cancer Research Centre, Bologna, Italia

Human dentin is formed during the process of dentinogenesis synthesized by odontoblasts that, in addition to type I collagen, also secrete a number of non-collagenous proteins (NCPs) into extracellular matrix (ECM) during the process of dentinogenesis. The Small Integrin-Binding LIgand, N-linked Glycoprotein (SIBLING) family is one category of NCPs characteristic for dentin and bone including dentin matrix protein 1 (DMP1), dentin sialophosphoprotein (DSPP), bone sialoprotein (BSP), and osteopontin (OPN) [1].

Tertiary dentin is produced in reaction to external noxious stimulus/injury, such as trauma ordental caries and based on the type and extent of external stimuli or injuries, is further classified into reactionary dentin (RD) and reparative dentin (RepD).

Aim this study was to compare pattern distribution and quantification of SIBILINGs in reparative and reactionary dentin matrix, in response to stimulus, vs human sound dentin.

Ten carious human molars and ten sound human molars were selected for the study, demineralized, fixed, and processed for immunohistochemical approach to detect SIBILINGs. In particular specimens were submitted to an immunolabeling technique by using primary antibodies anti dentin matrix protein 1 (DMP1), dentin sialophosphoprotein (DSPP), bone sialoprotein (BSP), osteoponti (OPN), observed at light microscopy and then submitted to quantitative analysis.

Results indicate that the region exposed to carious lesion, SIBILINGs formed a layer of reparative dentin bridge sealing cavity formed by carious lesion and pulp chamber.

In response to the injury, the newly differentiated odontoblast-like cells makes adjustments to meet the challenges by altering the production of these dentinogenesis-related molecules, attempting to produce a hard barrier formation in a very rapid process.

References

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Key words

Human reparative dentin, SIBILINGs, immunohistochemical technique, light microscopy.