

## **DENTIN BONDING: EXPRESSION AND ACTIVITY OF MMP-2 AND MMP-9 IN HUMAN ODONTOBLASTS CULTURED FROM TOOTH SLICES**

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Studies revealed that host-derived proteinases to the collagen matrix breakdown could have potential implications in dentin bonding (1). Indeed, the results of these studies suggest that degradation of incompletely infiltrated zones within the hybridized dentin by host-derived dentin matrix metalloproteinases (MMPs) may proceed in the absence of bacterial enzymes. Thus, the objective of this study is to determine the origin of MMPs: dentin bonding systems either influence the expression of MMPs by odontoblasts or only active host-derived metalloproteinases within the dentin matrix. MMPs are zinc-dependent proteases that play a critical role in the normal turnover of extra cellular matrix. Few studies have shown that dentin pulp complex of healthy and carious teeth express and secrete also several type of MMPs including collagenases (MMP-1, -8, -13, -20), gelatinases (MMP-2, -9), membrane-type (MMP-14), enamelysin (MMP-20), (2,3). Interestingly, The MMP-2 and MMP-9 were expressed by both odontoblasts and pulp tissue (4).

Twenty fresh, non carious, human third molars were extracted from patients 15-18 years old for orthodontics reasons. An occlusal cavity was prepared on each tooth with a diamond bur (1.6 mm diameter) under water-spray cooling combined with culture medium. The size of these cavities was standardized, so that they did not extend over more than one half of the dentin thickness. Teeth were randomly assigned to two experimental groups (n=10). A dentin bonding system (Xeno III, Dentsply De Trey, Konstanz, Germany) was applied on each cavity of the first group. A flowable resin composite (Ceram X, Dentsply De Trey, Konstanz, Germany) was applied to all bonded specimens and light cured. The second group, without dentin bonding system was used as control. The teeth were carefully sectioned and thick slices were cultured as described

previously (5). The slices were cultured up to 7 days.

The slices were treated for immunohistochemical detection of MMP-2 and MMP-9 and the culture medium was used for zymography analysis.

The results show that the dentin bonding systems influence directly the expression of metalloproteinases by odontoblasts. Indeed, after 7 days in culture, an intense immunoreactivity was observed for MMP-2 and MMP-9 respectively in the odontoblast layer and the pulp tissue in the group with dentin bonding system. The same results were shown with zymography analysis.

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