

## Localization of type IV membrane during collagen alpha 1 to alpha 6 chains in basement mouse molar germ development

Type:

Article

Abstract:

The dental basement membrane (BM) putatively mediates epithelial-mesenchymal interactions during tooth morphogenesis and cytodifferentiation. Type IV collagen  $\alpha$  chains, a major network-forming protein of the dental BM, was studied and results disclosed distinct expression patterns at different stages of mouse molar germ development. At the dental placode and bud stage, the BM of the oral epithelium expressed  $\alpha 1$ ,  $\alpha 2$ ,  $\alpha 5$  and  $\alpha 6$  chains while the gubernaculum dentis, in addition to the above four chains, also expressed  $\alpha 4$  chain. An asymmetrical expression for  $\alpha 4$ ,  $\alpha 5$  and  $\alpha 6$  chains was observed at the bud stage. At the early bell stage, the BM associated with the inner enamel epithelium (IEE) of molar germ expressed  $\alpha 1$ ,  $\alpha 2$  and  $\alpha 4$  chains while the BM of the outer enamel epithelium (OEE) expressed only  $\alpha 1$  and  $\alpha 2$  chains. With the onset of dentinogenesis, the collagen  $\alpha$  chain profile of the IEE BM gradually disappeared. However from the early to late bell stage, the gubernaculum dentis consistently expressed  $\alpha 1$ ,  $\alpha 2$ ,  $\alpha 5$  and  $\alpha 6$  chains resembling fetal oral mucosa. These findings suggest that stage- and position-specific distribution of type IV collagen  $\alpha$  subunits occur during molar germ development and that these changes are essential for molar morphogenesis and cytodifferentiation.

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