Analysis of anchoring fibril formation in the transgenic mice carrying the human type VII collagen gene

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[Background] Recessive dystrophic epidermolysis bullosa comprises a group of hereditary bullous diseases characterized by subepidermal blistering caused by mutations in the type VII collagen gene (COL7A1) that is a major component of anchoring fibril (AF). No specific therapies are available for any form of epidermolysis bullosa.

[Purpose] We have investigated AF formation in the transgenic mice (Tgm) that express human COL7A1 in epidermal keratinocytes or dermal fibroblasts.

[Methods] The vector for epidermal expression was constructed with human keratin 14 (K14) promoter and human COL7A1 cDNA. The vector for dermal expression was constructed with mouse COL1A2 (COL1) promoter and human COL7A1 cDNA. We generated the Tgm by microinjection method. Screening of the founder mice (F0) was performed by PCR and immunohistochemistry with an antibody against type VII collagen (LH7.2; human specific antibody). Tgm(F0) were outbred with the wild type to produce Tgm(F1), that were also analysed using PCR, immunohistochemistry and RT-PCR, Western blotting, immunoelectron microscopy.

[Results and Conclusion] In both K14 Tgm(F1) and COL1 Tgm(F1) skin, normal AF formation was seen within basement membrane zone. These data indicate that we can select either keratinocytes or fibroblasts as target cells in case of gene therapy for recessive dystrophic epidermolysis bullosa.