A Comparison of Tilting dynamic culture with Blinking dynamic culture for the Reconstruction of Rabbit Corneal Epithelium on Lyophilized Amniotic Membrane

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The reconstruction of rabbit corneal epithelium was performed through blinking dynamic culture method using self-manufactured amniotic membrane (AM) supporter and lyophilized amniotic membrane (LAM)[1)]. Blinking dynamic culture method simulating eye environment was introduced to differentiate corneal epithelial cells. In this study, we applied tilting dynamic and blinking dynamic culture to the reconstruction of corneal epithelium on LAM. Primary rabbit corneal epithelial cells were isolated and cultured from limbus. Two Teflon rings were manufactured in order to culture the corneal epithelial cells on LAM. The third and fourth rabbit corneal epithelial cells were used to reconstruct corneal epithelium by static, tilting dynamic and blinking dynamic culture. To evaluate the reconstructed corneal epithelium, we stained the reconstructed tissue sections against CK3, PCNA, and examined TEM. Tilting dynamic culture was better than static culture in terms of reconstructed corneal cell layers and proliferating activity for reconstructing corneal epithelium on LAM. Blinking dynamic culture, comparing with static culture, showed similar properties with rabbit cornea in stratification and differentiation of corneal epithelial cells under histological examination.

The corneal epithelium was successfully reconstructed by the use of LAM and self-manufactured AM supporter by blinking dynamic culture. The reconstructed corneal epithelium in this experimental study is considered to be a good *in vitro* model in

autograft and allograft for treating the patients with severely damaged corneal surface and allograft for treating damaged skin and mucosa.

Reference

1. Ahn JI, Jang IK, Lee DH, et al. A comparison of lyophilized amniotic membrane with cryopreserved amniotic membrane for the reconstruction of rabbit corneal epithelium. *Biotechnology and Bioprocess Engineering* 2005, 10:262-269.