Project 1 The Role of LaNt α31 in Corneal Limbal Stem Cell Activation

Introduction

LaNt α31 (Laminin N terminal) proteins, a recently discovered protein and product of alternative splicing of laminin α3 gene, have been suggested to have a functional role in skin epithelial cell attachment, migration and stem cell regulation. We already know that laminin-332 is present within the cornea; since LM332 and LaNt α31 distribution partially co-localize it would be fair to hypothesis that LaNt α31 is also present within the cornea. Our aim was to determine the distribution of the LaNt α31 in the anterior segment of the eye and identify its functional role in the LESC activation.

Method

Limbal explants (n=4) were received from St Paul's eye theatre as "rims" after corneal surgery, the limbal rims were grown in culture to simulate a corneal wound model. Once there was evidence of LESC activation and proliferation the limbal rims were stained using immunohistochemistry for LaNt α31 and limbal basal cells markers (K15 and EGFR) to mark the distribution in both the intact and injured cornea.

Result

LaNt α31 and the limbal basal cell marker displayed dramatic variation their distribution in the intact cornea compared to the injured cornea. In the intact cornea, both LaNt α31 and the limbal basal cell markers were restricted to the limbal basal cells; however once the LESC were activated these proteins were no longer restricted to the basal cells and were visible throughout the limbal epithelium.

Conclusion

Our results showed the correlation between LESC and LaNt α31, this indicates that LaNt α31 may have a role in their activation during wound healing. In order to truly understand the capabilities of LaNt α31 as a possible tool to stimulate corneal wound healing, functional studies will need to be conducted to see if this new protein will be a future contender in the exciting field of stem cell research.