

## **Growth Factors and Corneal Wound Healing**

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Failure of the ocular surface to properly heal after wounding may occur in a variety of clinical situations, and treatment of the resultant persistent epithelial defects can be extraordinarily frustrating to even the most knowledgeable cornea and external disease expert. Discontinuation of potentially toxic medications, treatment of surface desiccation and exposure, protection of the ocular surface through bandage soft contact lenses, and tarsorrhaphy, and suppression of chronic inflammation usually will result in closure of epithelial defects, but a significant number of patients exist in whom these measures are insufficient to achieve that desired goal. For this reason, interest in "growth factors" which might enhance epithelial mitosis, epithelial migration, and epithelial adhesion to the underlying substrate has been of substantial interest for the past 2 decades. Despite this interest, we still lack some magic elixir, the application of which will consistently promote closure of a persistent epithelial defect. Fibronectin therapy, for example, was a disappointment in randomized, masked, placebo controlled trials, as was epidermal growth factor. More recently, nerve growth factor has been reported by the Italians, as usual, in an unmasked, uncontrolled study, to promote closure of such defects, and insulin growth factor and fibroblast growth factor and now fetal umbilical cord blood are also gaining interest in the ophthalmic community for this indication. The use of amniotic membrane grafting, of course, has been addressed in these pages previously (April, issue), as has been the strategy of limbal stem cell grafting (March, issue). In truth, problems with the ocular surface are commonly complex, and I would bet that it is unlikely that some single medical or surgical therapy will be the long searched for "Holy Grail". My guess is that a case-by-case analysis of each individual with persistent epithelial defect will be essential in order for the clinician to develop a clear sense of the factors contributing to the failure for the wound to close, with subsequent attention to each of the factors contributing to that failure.

We currently have three prospective trials ongoing in the care of patients with non-healing corneal epithelial defects:

1. The use of fetal cord blood
2. The use of amniotic membrane
3. The use of limbal stem cell grafting

We believe that only through such clinical trials will the true usefulness of any particular modality be discerned.