

Keratin 13 is a more specific marker of conjunctival epithelium than keratin 19

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Introduction

To evaluate the expression patterns of cytokeratin (K) 12, 13, and 19 in normal epithelium of the human ocular surface to determine whether K13 could be used as a marker for conjunctival epithelium.

Methods: Total RNA was isolated from the human conjunctiva and central cornea. Those transcripts that had threefolds or higher expression levels in the conjunctiva than the cornea were identified using microarray technique. Expression levels of three known signature genes and of two conjunctival genes, K13 and K19 were confirmed by using quantitative real-time PCR (qRT-PCR). Protein expression of K12, K13, and K19 was confirmed by immunostaining with specific antibodies on histologic sections of human sclerocornea that contained the conjunctiva, limbus, and cornea and on impression cytology (IC) specimens of the cornea and conjunctiva from normal donors. Double staining of K13/K12 and K19/K12 on histologic sections and IC specimens was performed.

Results:

There were 337 transcripts that were preferentially expressed in the conjunctiva. K13 and K19 were among the top twenty transcripts in the conjunctiva and this preferential expression pattern of K13 and K19 was confirmed by qRT-PCR. Immunohistochemical studies showed that K13 was expressed at the posterior limbal epithelium and conjunctival epithelium but was totally absent in the cornea. K12 was expressed in the corneal and anterior limbal epithelia except for the basal layer and was absent from the conjunctiva. In contrast, K19 was detected in the corneal, limbal and conjunctival epithelia. Immunostaining of the IC specimens showed K12+ epithelial cells in the corneal region, K13+ cells in the conjunctival area, and K19+ cells in the corneal and conjunctival specimens. Expression of K13 and K12 on the ocular surface was mutually exclusive on both the histologic and IC samples using double immunostaining.

Conclusions:

K13 is more specific to the conjunctival epithelial cells than K19 and potentially could be used as a marker to identify conjunctival epithelial cells in limbal stem cell deficiency.

Key Words: Keratin 13, Keratin 19, Stem cell.

Oral Presentation

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