Introduction: Corneal transparency is dependent on regular organization of collagen fibers. (Jester et al., 2008). α11β1 integrin has been identified as a mediator in cell adhesion to collagen I and IV and it has a stronger interaction with collagen I. This molecule has been associated with the organization of the corneal collagen matrix as cell-collagen interactions are crucial for the reorganization of the collagen matrix in both wound healing and developing tissues (Zhang et al., 2003).

The importance of the α11 integrin chain in collagen deposition in keratoconus related corneal scarring and corneal development has been suggested by a previous study (Byström et al., 2009). In this study we evaluated the importance of α-11 integrin in a mouse model for corneal wound healing and fibrosis.

Material and Methods: 33 α-11 integrin knockout (KO) and 42 control wild-type (WT) mice were studied. A laser procedure was done with a TecnoLas Keracor 217 excimer laser system (Bausch&Lomb Inc., Rochester, NY, USA). Mice were only submitted to treatment on their right eyes and the left eyes were used as control. The corneal stroma was exposed after mechanical removal of a central circular area of epithelium with a diameter of 2.1 mm.

Plano excimer photoablation was performed in this area with 2.1 mm diameter with a depth of 20μm and in some animals a second ablation with a grid pattern was done increasing the depth to 40 μm. Mice were sacrificed 4, 14, 22, 69, 80, 110 and 160 days after surgery. Corneal cross-sections were studied with immunochemistry with antibodies for α-11 integrin, collagen types I and IV, α-sm and CD34.

Results: Untreated KO mice had apparently normal corneas but corneal thickness was slightly reduced when compared to wild type mice. Treated corneas from KO animals were morphologically different from those from WT mice. 14 days after surgery KO mice had more irregular stromal collagen fibers than control mice. Even though these differences diminished with time, 69 days after the procedure collagen lamellae in the KO mice were more widely spaced and irregular.

KO mice also had a more variable keratocyte morphology with an irregular patch-staining pattern in the laser treated regions. 80 to 160 days after the procedure 85.7% of α-11 integrin KO animals treated with laser presented scar formation whereas only 47.1% of the WT mice had corneal scars.

Conclusions: Albeit α-11 integrin is not essential for corneal transparency it has a role in collagen deposition in corneal healing and remodeling.