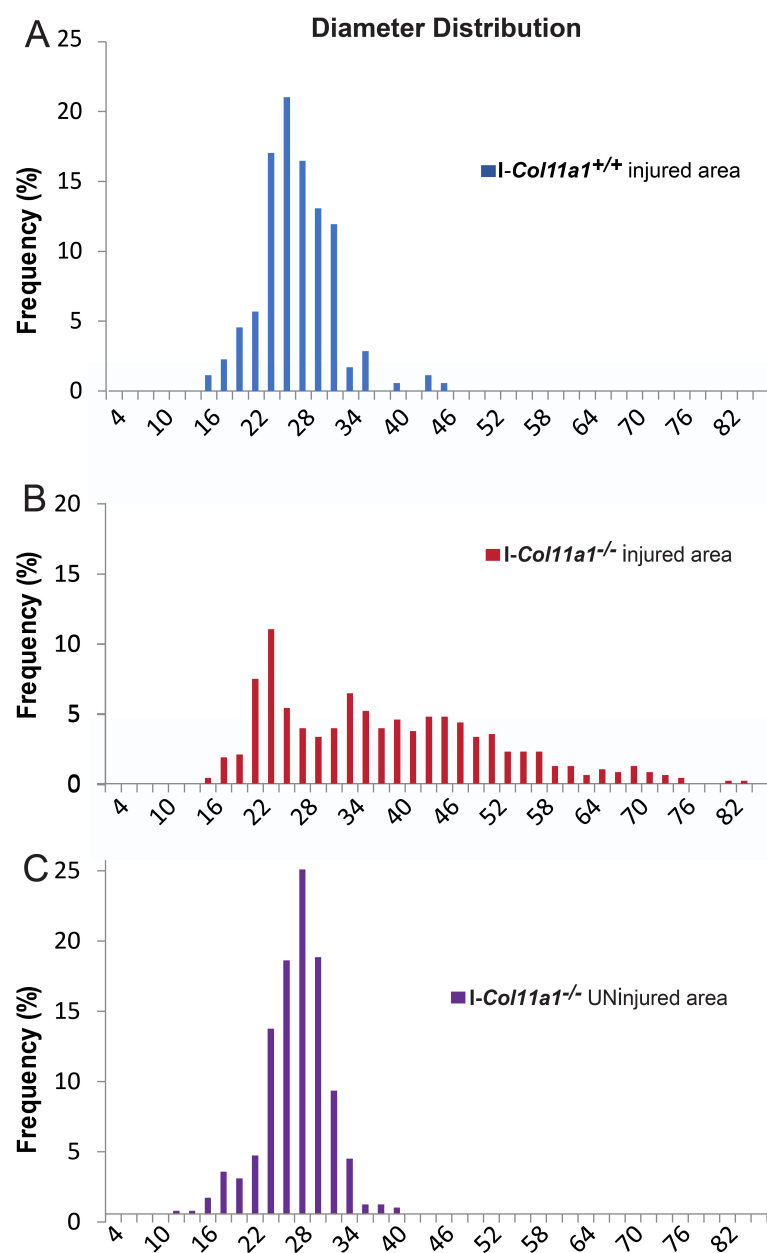


**Fig. S1. Collagen XI expression decreases with stromal maturation.** Expression of collagen XI is inferred from quantitation of pixel intensity obtained from different immunofluorescence images. Decreasing pixel intensity measurement with maturation suggest downregulation of collagen XI expression with stromal maturation. There is a statistically significant trend with decreasing collagen XI expression as tissue matures, Cuzick's test,  $p < 0.0001$ .  $n = 3$  per age.



**Fig. S2. Collagen XI expression regulates fibrillogenesis and fibril size.** Histogram shows fibril distribution in the injured area of *Rosa<sup>Cre-ERT2/Cre-ERT2/Col11a1<sup>flox/flox</sup></sup>* mice, I-Col11a1<sup>+/+</sup>, injected with intraperitoneal oil with predominantly small size fibrils of a homogenous size (A). I-Col11a1<sup>-/-</sup> mice injected with intraperitoneal Tm show abnormal group of regenerated fibrils of different size and shape in the injured area. Larger than normal 25 nm fibrils predominate in the regenerated stroma (B). In contrast, I-Col11a1<sup>-/-</sup> mice injected with intraperitoneal Tm show typical small size corneal fibrils of homogenous size in the uninjured area (C). At least three corneas from different animals per condition were used for quantification.