

## Supplementary materials

### 1. Supplementary tables

**Supplementary Table S1. Primers used for qPCR detection**

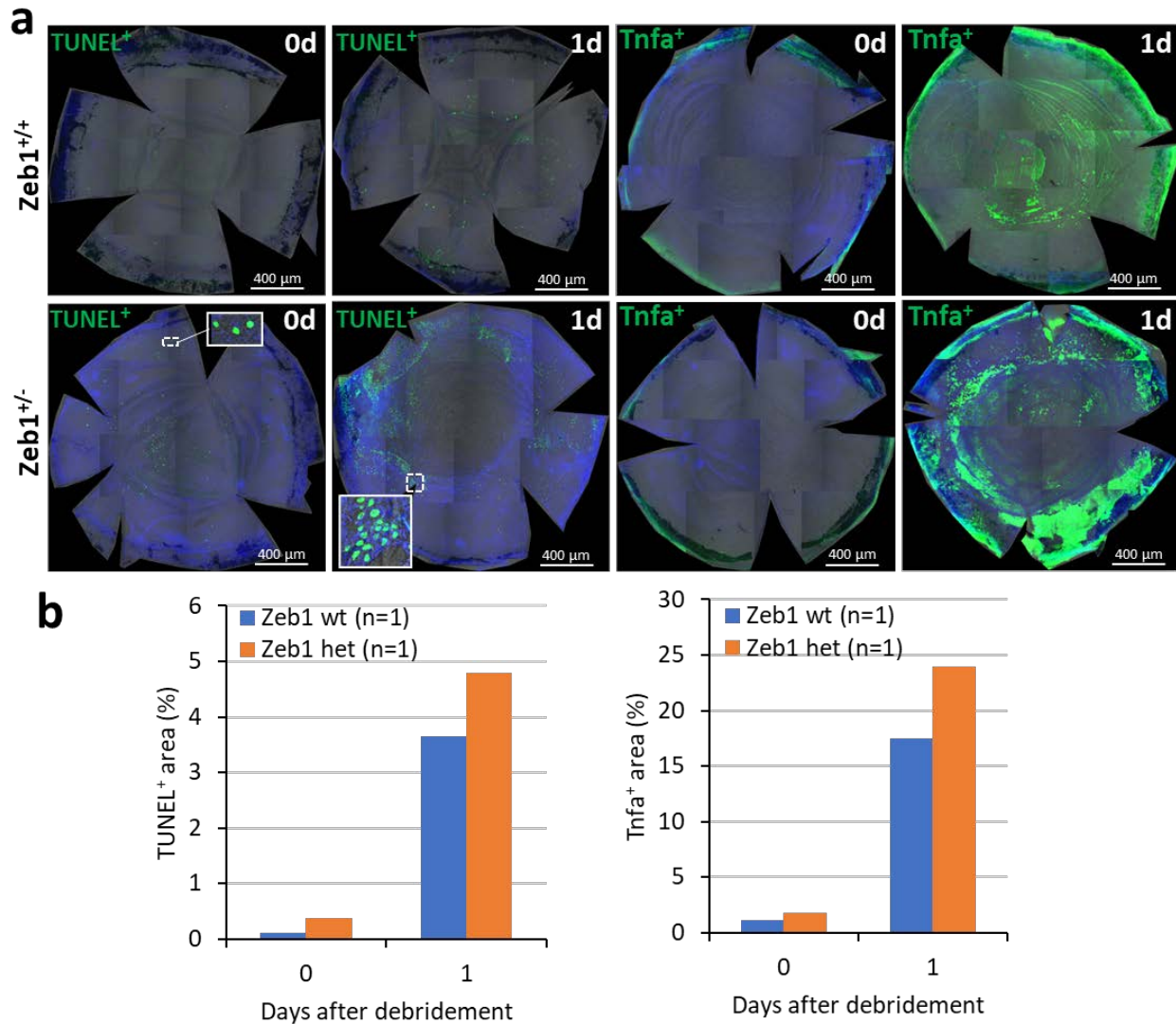
| Primer name | Sequence (5'—3')        | Amplicon (bp) |
|-------------|-------------------------|---------------|
| Hs ACTB LP  | GGACTTCGAGCAAGAGATGG    | 234           |
| Hs ACTB RP  | AGCACTGTGTTGGCGTACAG    |               |
| Hs CDH1 LP  | TTTCCACCAAAGTCACGCTG    | 162           |
| Hs CDH1 RP  | GGCAGCTGATGGGAGGAATA    |               |
| Hs FN1 LP   | GCAACGATCAGGACACAAGGAC  | 207           |
| Hs FN1 RP   | GGTGAGGCTGCGGTTGGTAA    |               |
| Hs ITGA5 LP | CAGATCCTGTCTGCCACTCA    | 249           |
| Hs ITGA5 RP | GAGGGATCGAATGTCTGAGC    |               |
| Hs P15 LP   | GGTGAGAGTGGCAGGGTCT     | 174           |
| Hs P15 RP   | CGGGGACTAGTGGAGAAGGT    |               |
| Hs P19 LP   | ATGCTGCTGGAGGAGGTTC     | 158           |
| Hs P19 RP   | CTGCCAAACATCATGACCTG    |               |
| Hs P21 LP   | CAGCAGAGGAAGACCATGTG    | 153           |
| Hs P21 RP   | GGCGTTTGGAGTGGTAGAAA    |               |
| Hs P27 LP   | CCGGCTAACTCTGAGGACAC    | 221           |
| Hs P27 RP   | CTTCTGAGGCCAGGCTTCTT    |               |
| Hs GAPDH LP | ATGGGGAAGGTGAAGGTCG     | 108           |
| Hs GAPDH RP | GGGGTCATTGATGGCAACAATA  |               |
| Hs MMP1 LP  | ATGCTGAAACCCTGAAGGTG    | 234           |
| Hs MMP1 RP  | CTGCTTGACCCTCAGAGACC    |               |
| Hs MMP3 LP  | AAGTGGAGGAAAACCCACCT    | 215           |
| Hs MMP3 RP  | TTTCCAGGTCCATCAAAAGG    |               |
| Hs MMP11 LP | GCAACCGACAGAAGAGGTTC    | 135           |
| Hs MMP11 RP | ATACCTTTAGGGCCTCTGCC    |               |
| Hs PLAU LP  | TCACCACCAAAATGCTGTGT    | 223           |
| Hs PLAU RP  | AGGCCATTCTCTTCCTTGGT    |               |
| Hs VIM LP   | CGAGGAGAGCAGGATTTCTC    | 91            |
| Hs VIM RP   | GGTATCAACCAGAGGGAGTGA   |               |
| Hs ZEB1 LP  | CTACAACAACAAGACACTGCTGT | 176           |
| Hs ZEB1 RP  | TGTTCTTTCAGAGAGGTAAAGCG |               |
| Mm Cdh1 LP  | CAGGTCTCCTCATGGCTTTGC   | 175           |
| Mm Cdh1 RP  | CTTCCGAAAAGAAGGCTGTCC   |               |
| Mm Fn1 LP   | AGGCAGGCTCAGCAAATCGT    | 157           |
| Mm Fn1 RP   | GGCTTCCTCCATAGCAGGTACA  |               |
| Mm Gapdh LP | AACGACCCCTTCATTGAC      | 191           |
| Mm Gapdh RP | TCCACGACATACTCAGCAC     |               |
| Mm Mmp2 LP  | TGACCTTGACCAGAACACCA    | 171           |
| Mm Mmp2 RP  | AAAGCATCATCCACGGTTTC    |               |
| Mm Mmp7 LP  | CCCTGTTCTGCTTTGTGTGTCT  | 177           |
| Mm Mmp7 RP  | GCATTTCTTGAGGTTGTCCAC   |               |
| Mm Nfkb LP  | GCTTTGCAAACCTGGGAATA    | 150           |
| Mm Nfkb RP  | TCAGGTCCATCTCCTTGGTC    |               |

|            |                         |     |
|------------|-------------------------|-----|
| Mm p15 LP  | CCCTGCCACCCTTACCAGA     | 169 |
| Mm p15 RP  | CAGATACCTCGCAATGTCACG   |     |
| Mm p16 LP  | CCCAACGCCCCGAAC         | 79  |
| Mm p16 RP  | GCAGAAGAGCTGCTACGTGAA   |     |
| Mm p21 LP  | GTGGCCTTGTCTGCTGTCTT    | 126 |
| Mm p21 RP  | GCGCTTGGAGTGATAGAAATCTG |     |
| Mm p27 LP  | TTGGGTCTCAGGCAAAC       | 157 |
| Mm p27 RP  | TCTGTTCTGTTGGCCCTTTT    |     |
| Mm Tnfa LP | CGTCGTAGCAAACCACCAAG    | 241 |
| Mm Tnfa RP | GGCAGAGAGGAGGTTGACTT    |     |
| Mm Vim LP  | CGGCTGCGAGAGAAATTGC     | 124 |
| Mm Vim RP  | CCACTTTCCGTTCAAGGTCAAG  |     |
| Mm Zeb1 LP | TGGCAAGACAACGTGAAAGA    | 200 |
| Mm Zeb1 RP | AACTGGGAAAATGCATCTGG    |     |

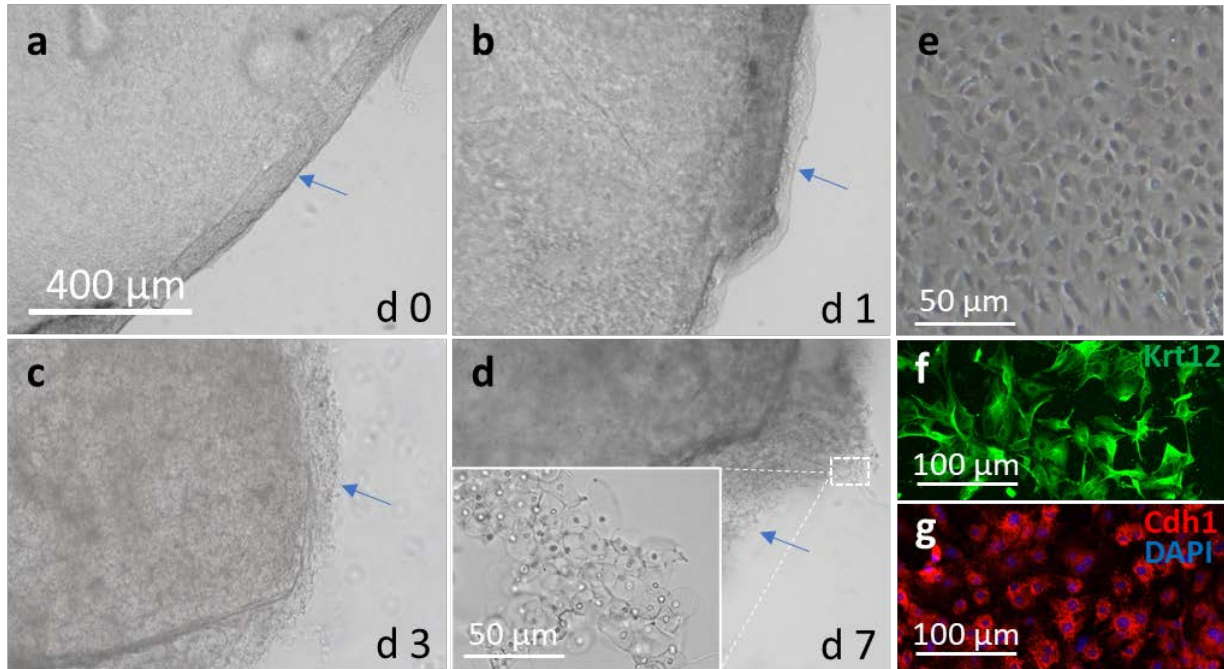
**Supplementary Table S2. Primers used for ChIP-PCR**

| Primer name     | Sequence (5' - 3')       | Amplicon (bp) |
|-----------------|--------------------------|---------------|
| Mm Nfkb Pro LP  | GGCACTTTGCCCAAAGAATA     | 162           |
| Mm Nfkb Pro RP  | ATCATCGCTGTGGATGGAAT     |               |
| Mm Tnfa Pro LP  | CTACCTGGCCATGACAACCT     | 231           |
| Mm Tnfa Pro RP  | ACTTTCCGAACACCCTTCCT     |               |
| Hs TNFR1 Pro LP | CTGAGGTGGGCAGATCATT      | 170           |
| Hs TNFR1 Pro RP | CGACCTCCCAGGTTCAAGTA     |               |
| Hs CDH1 Pro LP  | TAGAGGGTCACCGCGTCTAT     | 200           |
| Hs CDH1 Pro RP  | TCACAGGTGCTTTGCAGTTC     |               |
| Hs GAPDH Pro LP | TACTAGCGGTTTTACGGGCG     | 166           |
| Hs GAPDH Pro RP | TCGAACAGGAGGAGCAGAGAGCGA |               |
| Hs FN1 Pro LP   | AAAGAAAGGGAGCGGGATGGG    | 190           |
| Hs FN1 Pro RP   | GGGTGGTGGTAGTGTGTTGAGGA  |               |
| Hs MMP11 Pro LP | ATGGAACAATCTCGGCTCAC     | 177           |
| Hs MMP11 Pro RP | AGGTCAGGAGTTGGAGAGCA     |               |
| Hs P21 Pro LP   | TATTAGCTGGGCATGGTGGT     | 177           |
| Hs P21 Pro RP   | GCAGCCCTGGCTTTTTGTTT     |               |
| Hs PLAU Pro LP  | ATATCTGGGGACTGCCACTG     | 170           |
| Hs PLAU Pro RP  | CCAACCTGCCTAAGACTGCC     |               |

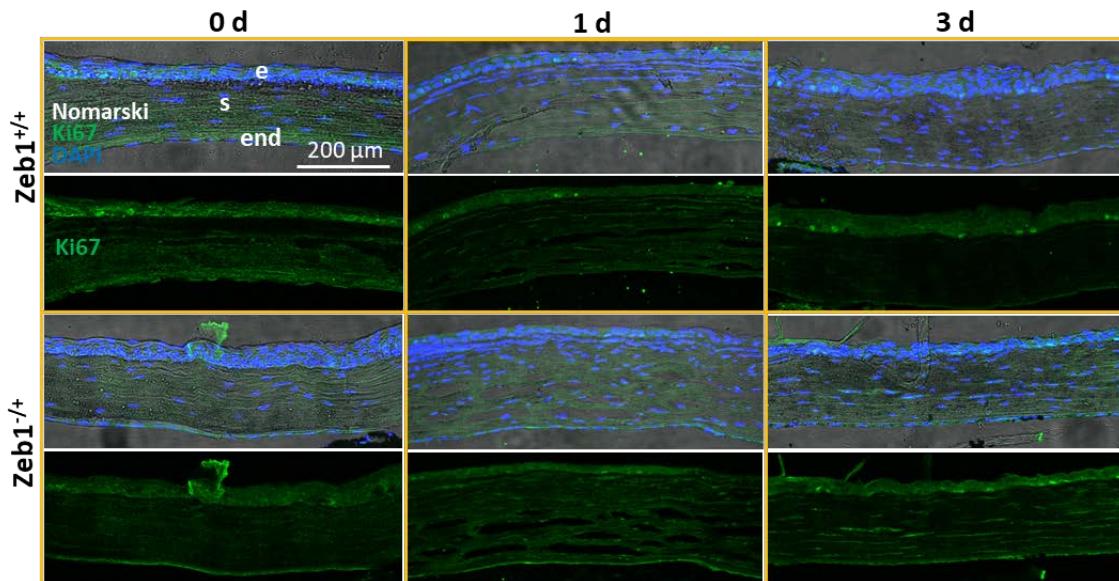
2. Supplementary figures.



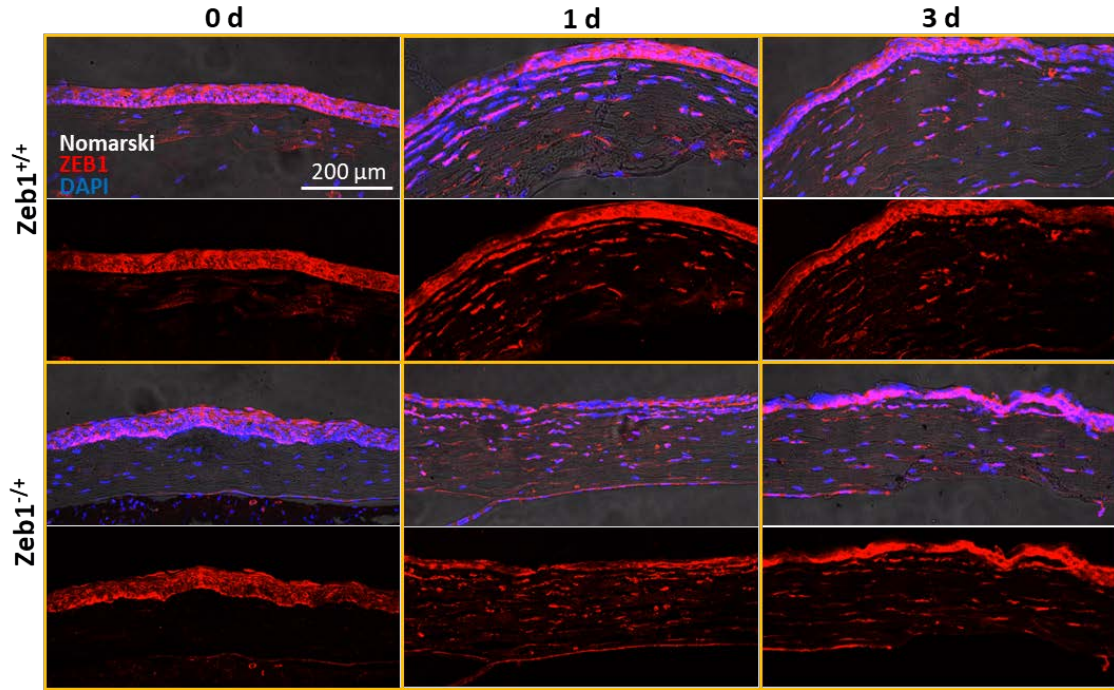
**Supplementary Figure S1. Wholemount immunostaining evaluation on corneal apoptotic cell death and Tnfa secretion before and after the debridement.** (a) To validate the results obtained by immunohistochemistry (IHC) on the corneal cross sections (Fig. 2 and Fig. 3) we conducted a corneal wholemount immunostaining to detect TUNEL<sup>+</sup> cell death and Tnfa<sup>+</sup> secretion using both Zeb1<sup>+/+</sup> (wt) and Zeb1<sup>+/-</sup> (het) corneas collected before (0d) and 1 day (1d) after the mechanical debridement. (b) The ratios of either TUNEL<sup>+</sup> or Tnfa<sup>+</sup> area to the related total corneal area indicated that the mechanical debridement and the monoallelic deletion of Zeb1 mutually increased corneal apoptotic cell death and Tnfa secretion.



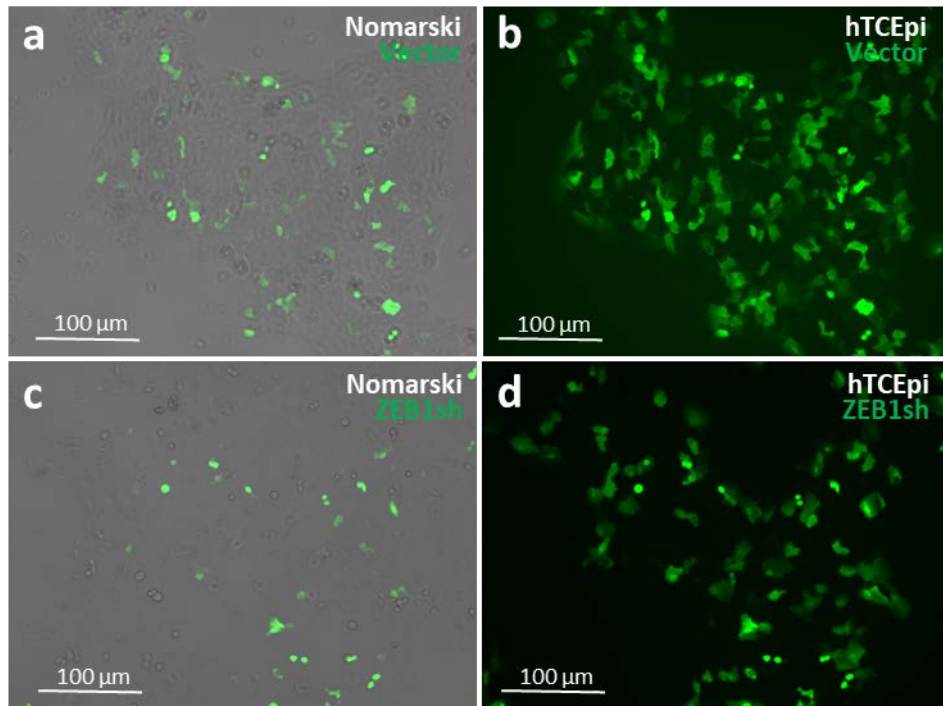
**Supplementary Figure S2. Mouse corneal epithelial cell isolation and culture.** The isolated mouse cornea is placed upside down on cell culture plate coated with 0.1% gelatin for (a) 0, (b) 1, (c) 3, and (d) 7 days. (e) The monolayer-cultured corneal epithelial cells and their immunofluorescence with (f) the corneal epithelial-specific marker Krt12 and (g) the common epithelial marker E-cadherin (Cdh1).



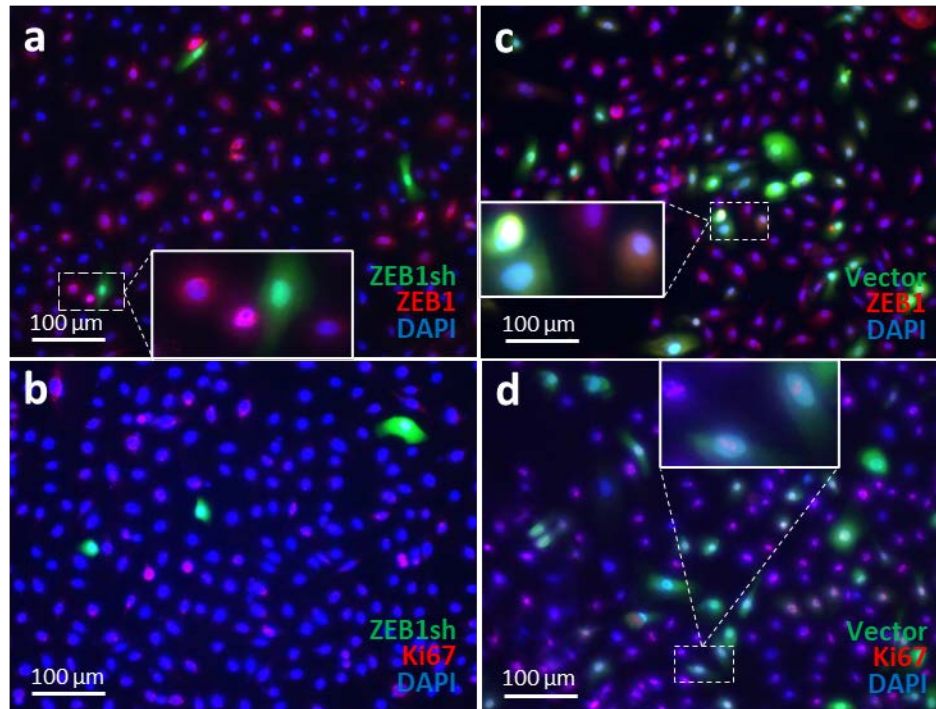
**Supplementary Figure S3. The Expression of the proliferative marker Ki67 in the central corneas of both *Zeb1*<sup>+/+</sup> and *Zeb1*<sup>-/-</sup> before (0d) and 1d and 3d after the epithelial debridement.** e, epithelium; s, stroma; end, endothelium.



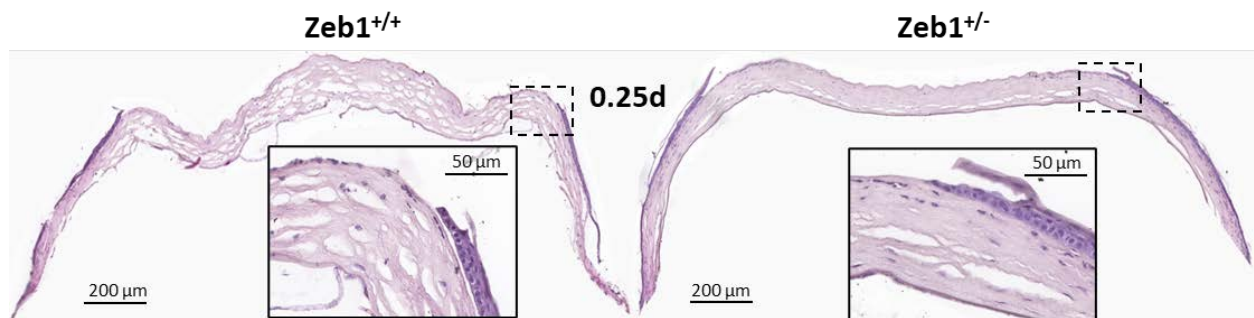
**Supplementary Figure S4. The Expression of Zeb1 in the central corneas of both Zeb1<sup>+/+</sup> and Zeb1<sup>-/-</sup> before (0d) and (1d and 3d) after the epithelial debridement.**



**Supplementary Figure S5. hTCEpi cells infected with the vector control (Vect Ctrl) or ZEB1sh lentivirus. Both Vect Ctrl and ZEB1sh express GFP, thereby the infection rates were calculated based on the GFP-expressed cells. After 3 passages in culture, (a), (b) the rate of Vect Ctrl cells was retained 80% with the GFP (c), (d) while that of the ZEB1sh was declined to 50%.**



**Supplementary Figure S6. hTCEpi cells infected with the vector control (Vect Ctrl) or ZEB1sh lentivirus.** After passage 7 times, only 1 – 2% of the hTCEpi cells showed the ZEB1sh GFP and their expression of both (a) ZEB1 and (b) Ki67 detected by the immunofluorescence was significantly lower than the rest cells without ZEB1sh GFP. Meanwhile about 50% of the hTCEpi cells showed the Vect Ctrl GFP and their expression levels of both (c) ZEB1 and (d) Ki67 were similar to the rest cells without ZEB1sh GFP



**Supplementary Figure S7. H&E histological assessment on the debrided corneas.** To clarify whether the central corneal epithelium is smoothly removed by the Alger Brush II under a stereo microscope, representative corneas of both Zeb1<sup>+/+</sup> and Zeb1<sup>+/-</sup> mice were collected in 6 hours (0.25d) after the mechanical debridement, and then fixed, paraffin-embedded, sectioned and H&E stained. It appeared the mechanical debridement of the corneal epithelium was done well with few basal cells scattered in the debrided areas.