**SUPPLEMENTARY FIGURES**

**Figure S1.** Flowchart showing treatment allocations of the rabbits used to study the adhesion strength of flaps prepared with VisuMax and Femto LDV femtosecond lasers. RE = right eye; LE = left eye.
Figure S2. Flowchart showing treatment allocations of the rabbits used to study the tissue responses following flap preparation with VisuMax and Femto LDV femtosecond lasers. In order to evaluate tissue responses solely to the femtosecond laser delivery, all flaps were not lifted after incision. RE = right eye; LE = left eye.
**Figure S3.** Flowchart showing treatment allocations of the human donor corneas used to evaluate the smoothness of flap bed prepared with VisuMax and Femto LDV femtosecond lasers. SEM = scanning electron microscopy.
Figure S4. Expression of Ki-67 in the central cornea after flap creation with VisuMax and Femto LDV femtosecond lasers. Ki-67 was not expressed in the corneal stroma 4 hours (A) and 24 hours (B) after treatment with VisuMax, but was expressed in some basal epithelial cells 4 hours (A) and 24 hours (B) after surgery. In Femto LDV group, Ki-67 was also absent in the corneal stroma 4 hours (C) and 24 hours (D) after flap preparation. Similar to VisuMax group, some basal epithelial cells expressed Ki-67 4 hours (C) and 24 hours (D) after treatment with Femto LDV. (E) Proliferative cells could be observed in the basal epithelial cells 24 hours after surgery in the positive control cornea. Positive control cornea received a -6D excimer stromal ablation after the flap was lifted. Scale bar = 100 µm. (F) Bar graph showing number of proliferative cells in the epithelium 4 hours and 24 hours after flap preparation with VisuMax and Femto LDV femtosecond lasers. Height of error bars represents standard deviation of mean number of Ki-67-positive cells/100x viewing field.