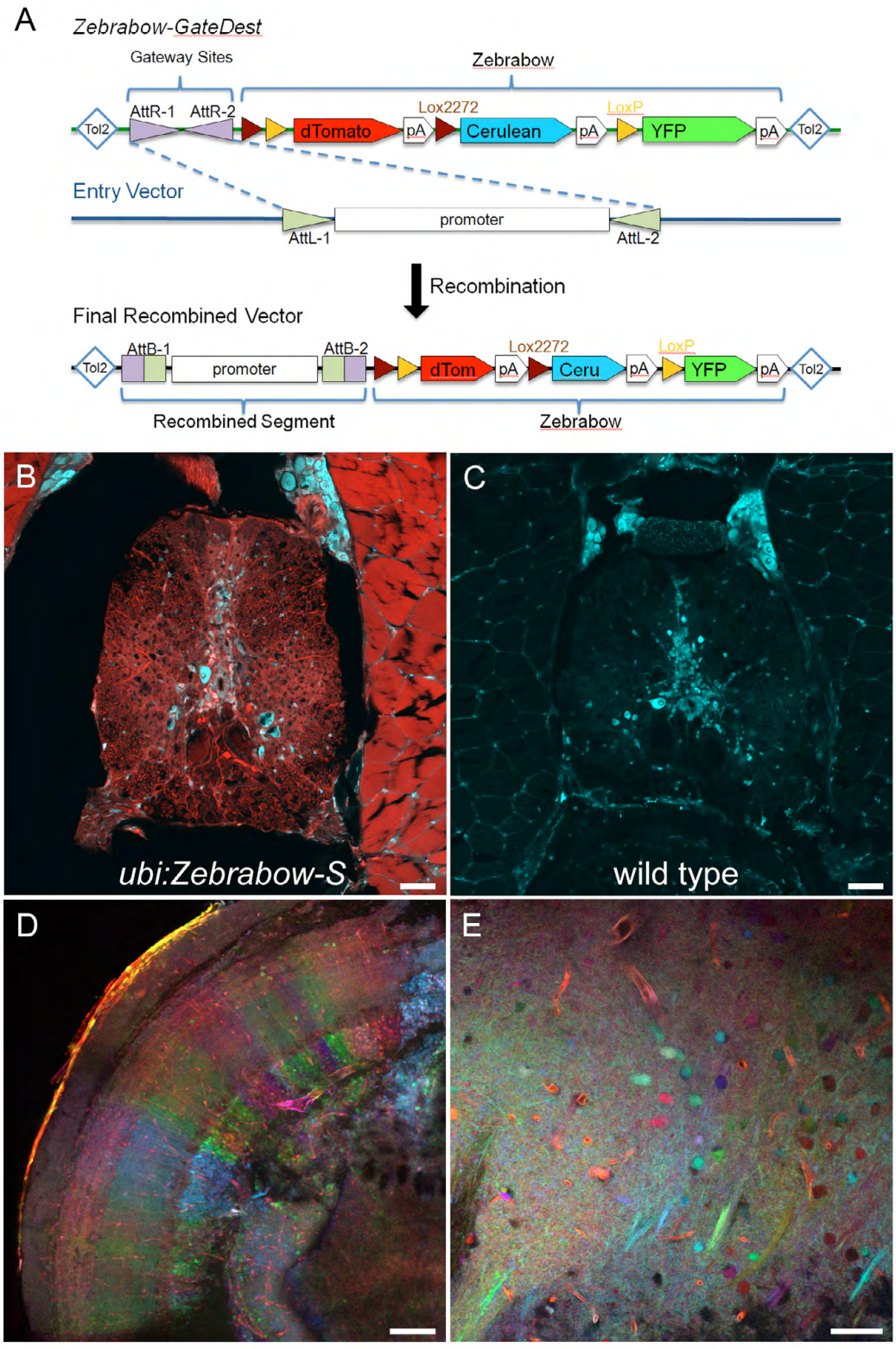


Fig. S1. Generation of Zebrabow transgenesis construct and analysis of transgenic expression in adult animals. (**A**) Diagram of the *Zebrabow-GateDest* cloning vector for inserting promoters upstream of Zebrabow. Promoters are first inserted between AttL sites to make an Entry vector. The Entry vector is then mixed with *Zebrabow-GateDest* and LR Clonase II to generate the final recombined vector. (**B**,**C**) Tissue sections of *ubi:Zebrabow-S* (B) and a wild-type adult fish (C) at the level of the spinal cord. RFP fluorescence is shown in red and Nissl counterstain is shown in cyan. (**D**,**E**) Brain sections from adult *ubi:Zebrabow-M;ubi:CreER* animal, with Cre induced at embryonic stage (10-12 hpf). Coronal section of the tectum (D) and sagittal section of the forebrain (E) are shown. Scale bars: 200 µm in B-D; 100 µm in E.

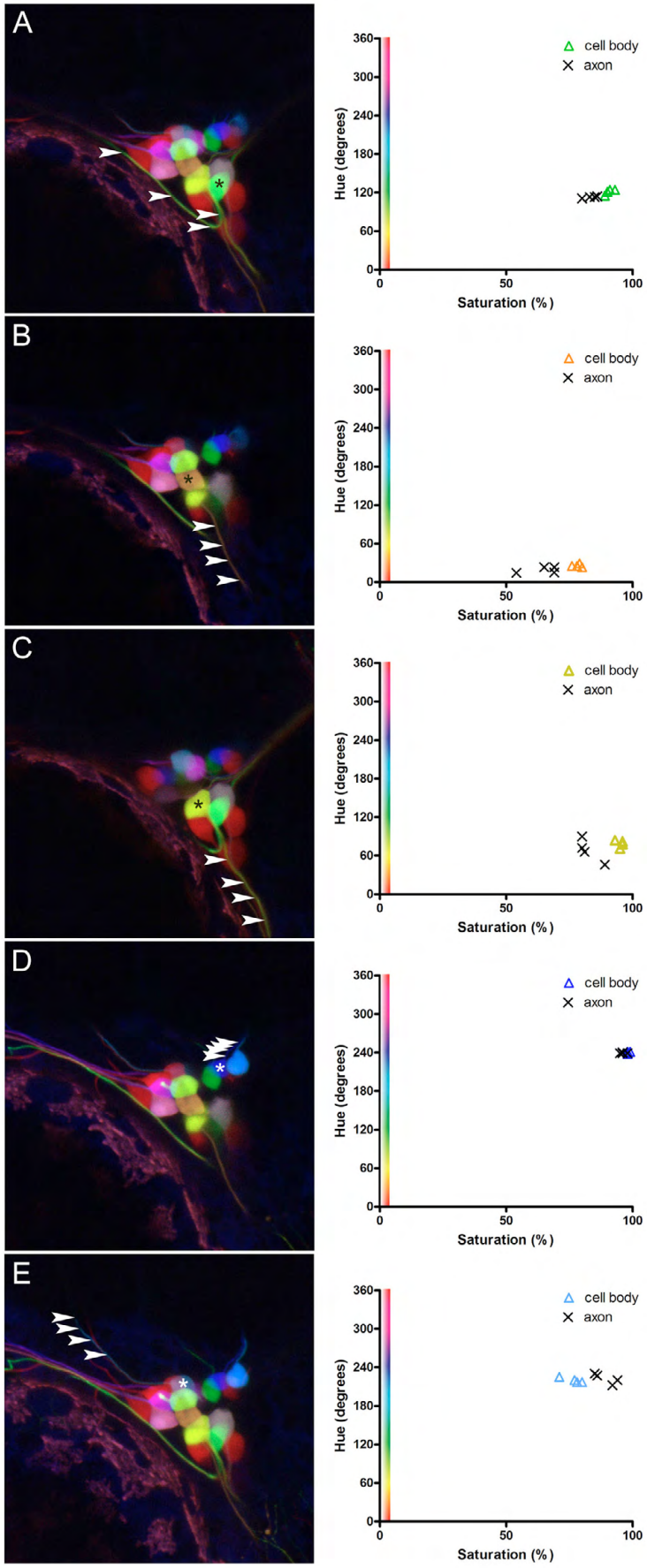


Fig. S2. Trigeminal sensory ganglion shown in Fig. 3D was tested for color constancy. (**A-E**) For five differently colored cells, hue and saturation values of their cell bodies (asterisk) in different *z*-planes and at different points along axons (arrowheads) were measured and plotted. Values are averaged from a 5×5 pixel square of a single optical section.

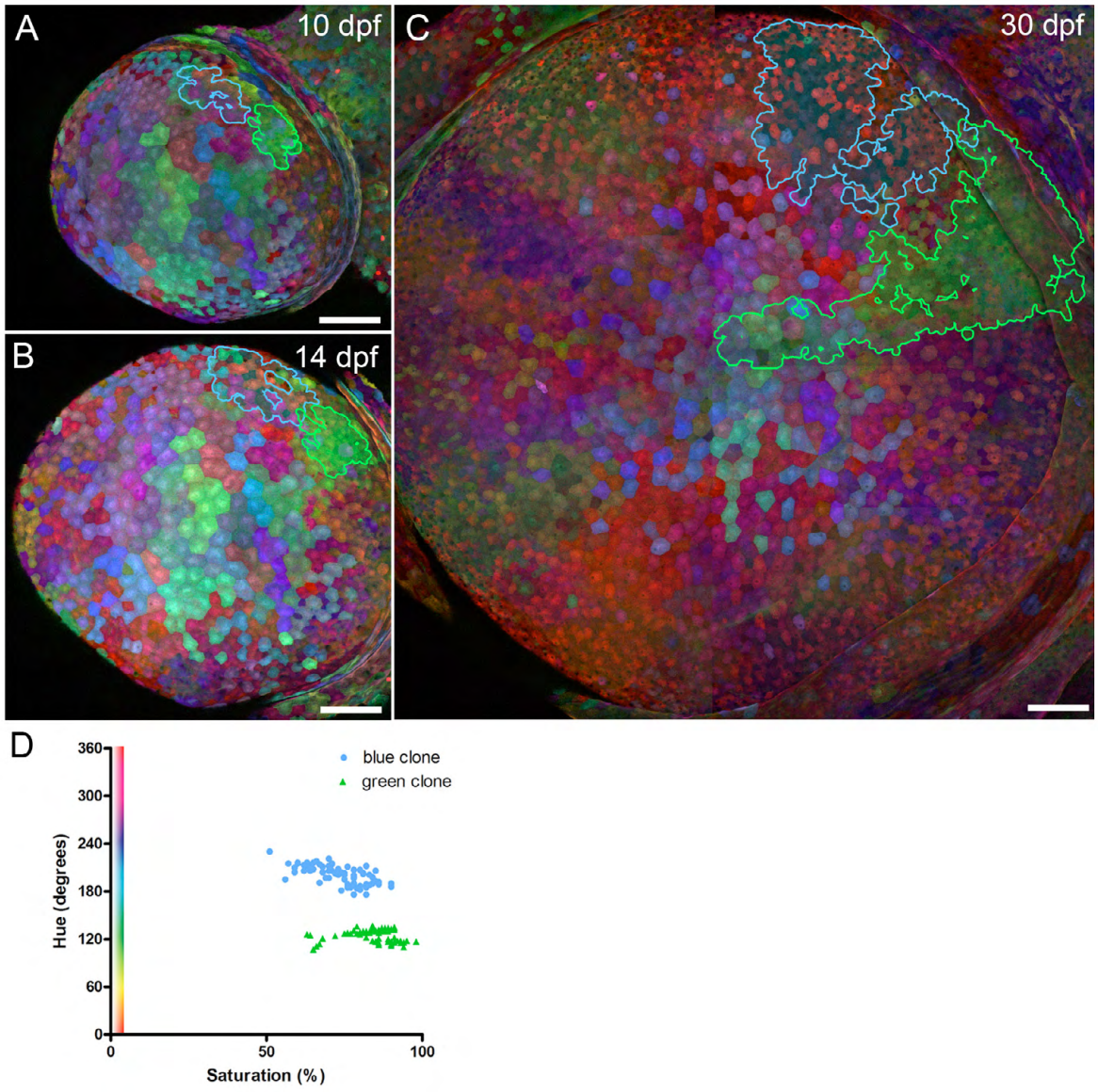
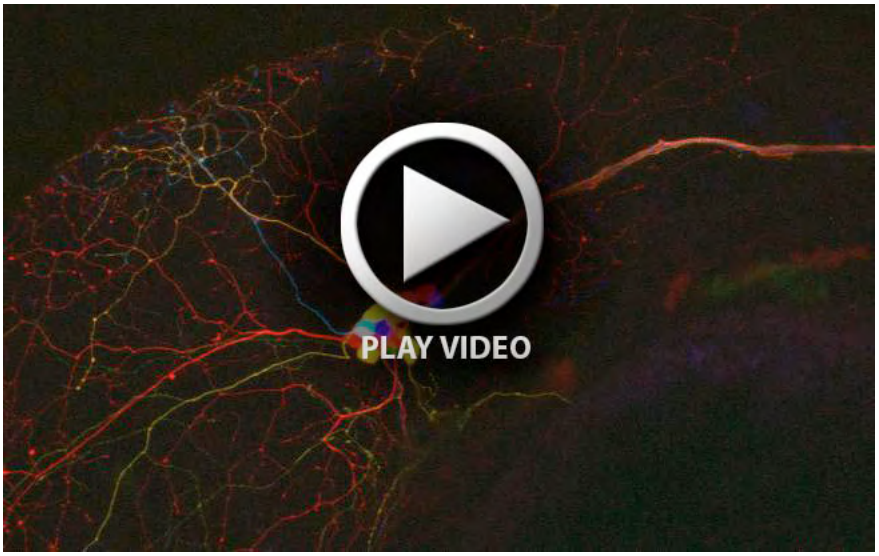


Fig. S3. Time-lapse imaging of clonal growth in the cornea. (**A-C**) Cornea clones imaged at 10 (A), 14 (B) and 30 (C) dpf. All images are montages of maximal intensity projections, shown at the same scale. One blue clone (blue outline) and one green clone (green outline) were traced. Both clones showed substantial centripetal growth. (**D**) Hue and saturation values of cells in the blue or green clone at 30 dpf are plotted. Measurements were made from 5×5 pixel areas from individual optical sections. Cells within a cohesive clone are consistent in their color profiles.



Movie 1. Time-lapse movie of somatosensory peripheral axon development from 28 to 44 hpf.

Movie 2. Axon traces from Movie 1.