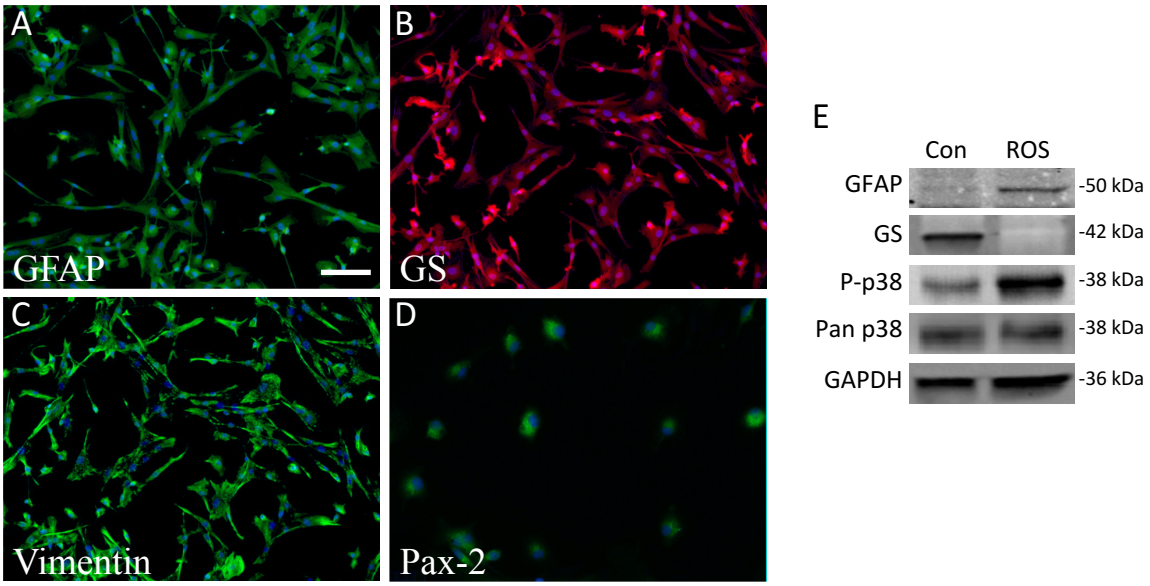
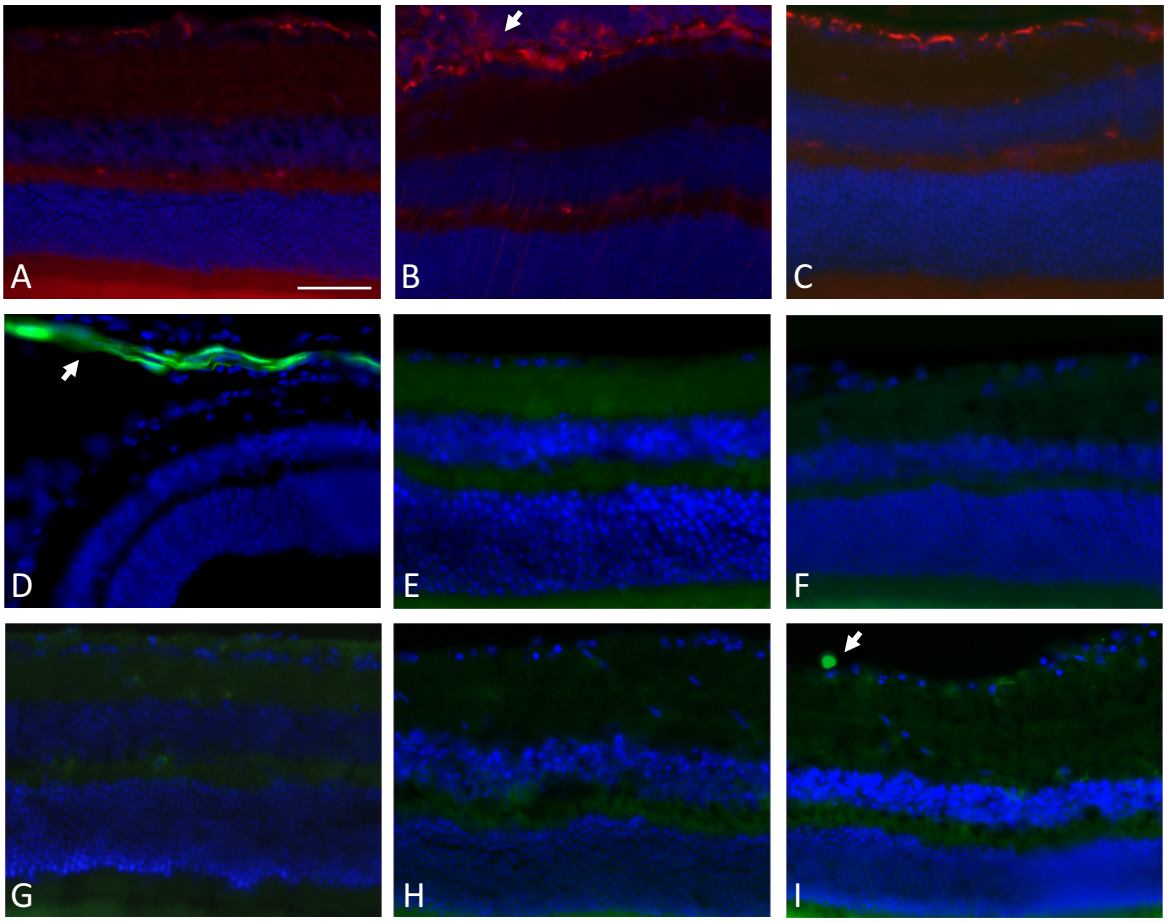
Supplementary Figure 1



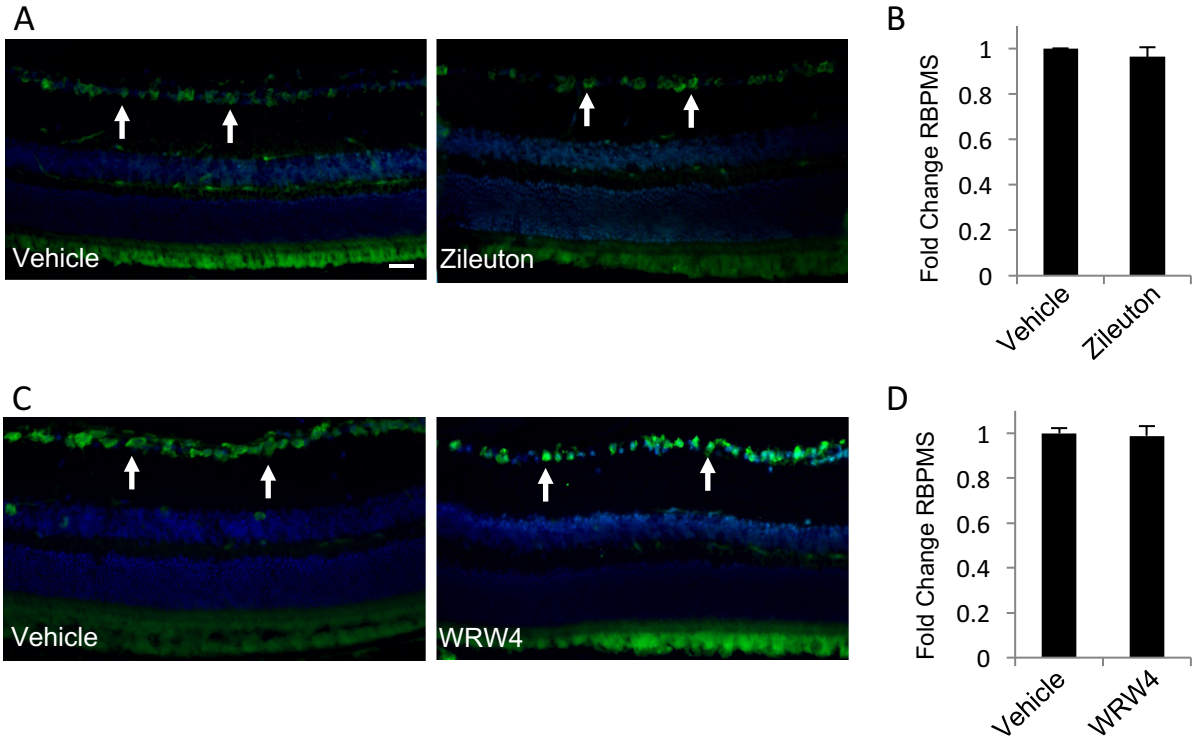
Supplementary Figure 1. Primary retinal astrocytes express appropriate markers and respond to injury, consistent with previously published results. Enchriched retinal astrocytes were probed with antibodies to A) GFAP, B) GS, C) vimentin, and D) Pax-2 (bar indicates 50μm). E) Protein extracts from the primary astrocytes grown in control media (Con) or challenged with ROS through exposure to 300μM PQ, show increased GFAP, reduced GS, and increased phosphorylation of p38 MAPK.

Supplementary Figure 2



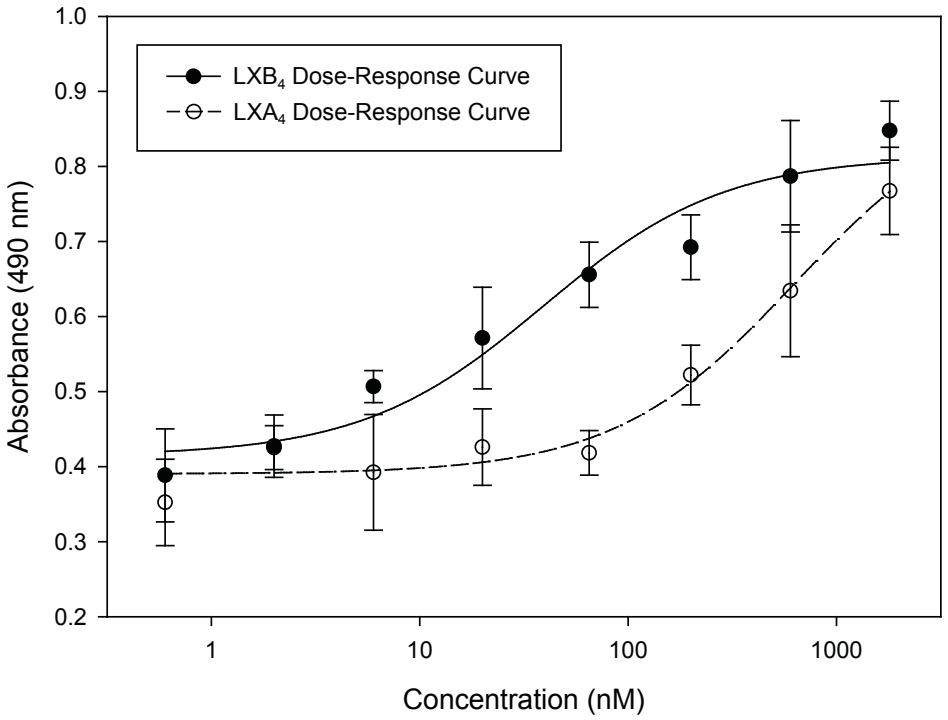
Supplementary Figure 2. Transplanted retinal astrocytes do not induce endogenous reactivity or inflammation. A-C) GFAP staining of retinas 16 days after injection with PBS (A), or RA (B-C). Endogenous activation was not induced at sites directly underlying the injected cells (B, arrow), or distant from them (C). D) Ad-GFP transduced RA do not integrate into the recipient retina and remain alive after two weeks (arrow). E-F) There was no TUNEL signal in transplant recipient retinas (E) compared to PBS control (F). As well, transplanted astrocytes did not induce widespread evidence of (G) microglial activation with CD68, (H) neutrophils or macrophages with GR-1, or (I) macrophage infiltration with F4/80 (arrow). (Bar indicates 50 μm).

Supplementary Figure 3



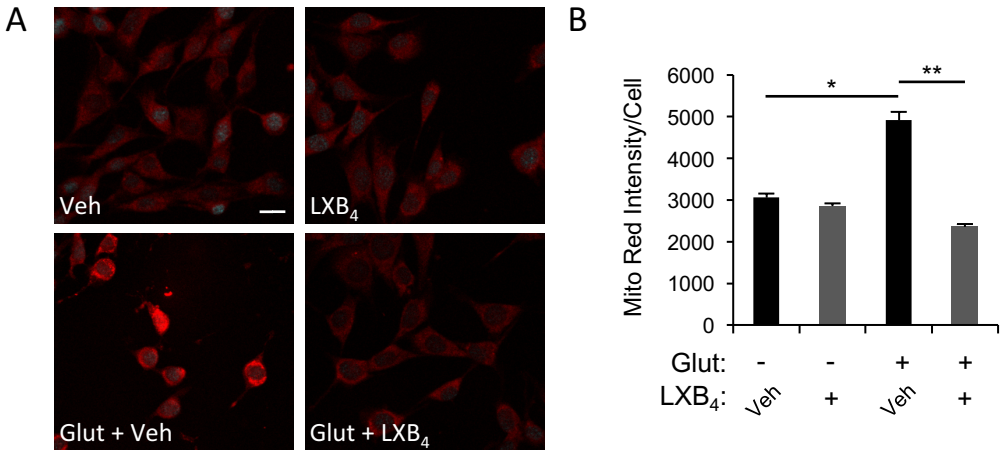
Supplementary Figure 3. Lipoxin signaling inhibitors had no effect on control retinas. Uninjured eyes were injected with either (A-B) Zileuton or (C-D) WRW4, and assessed for RGC loss by staining and counting RBPMS positive cells (green). There was no change for either drug (n=5, bars are S.E., scale bar represents 50 μm).

Supplementary Figure 4



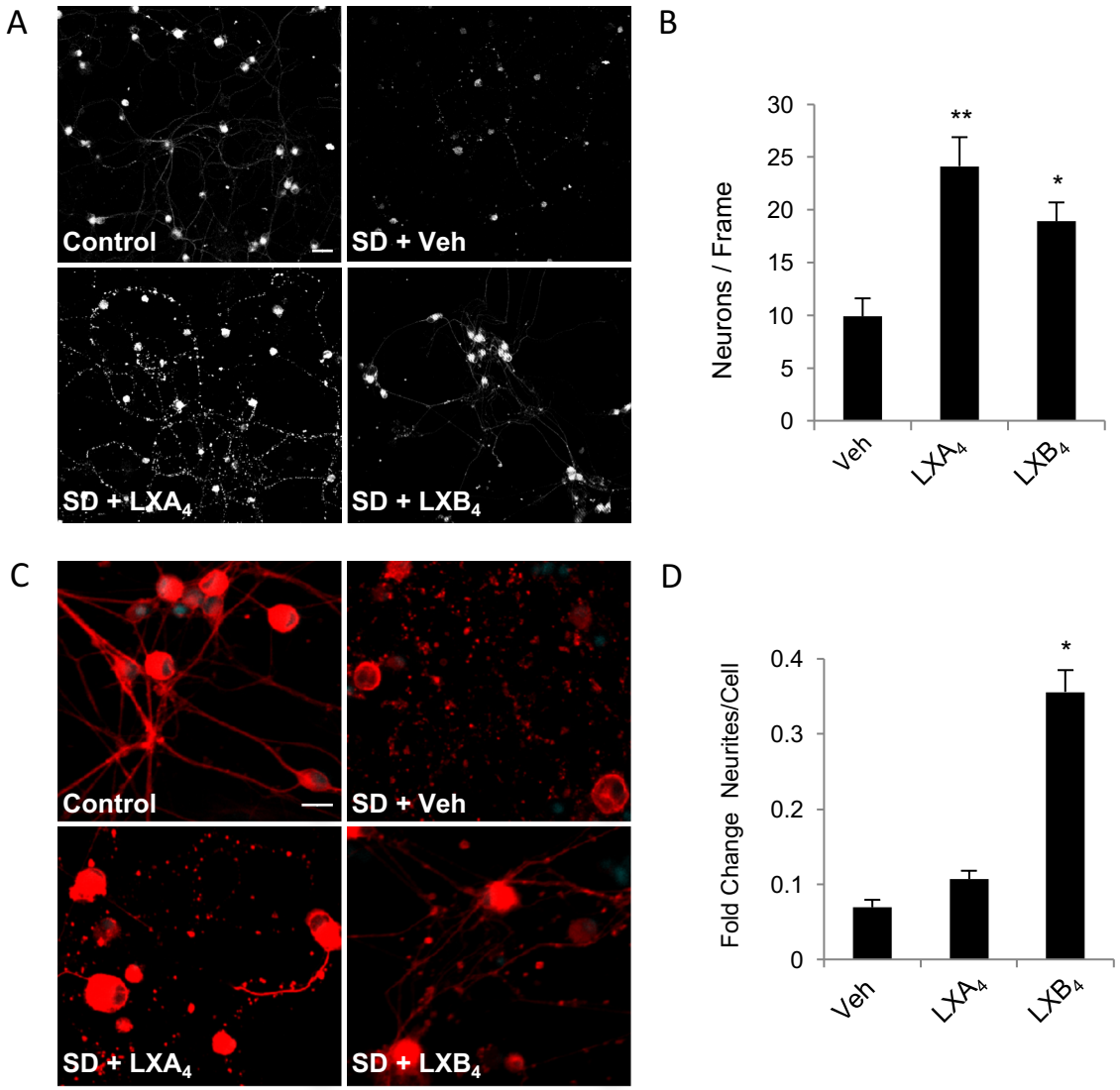
Supplementary Figure 4. Lipoxin neuroprotection dose response curves. Dose responses were generated for LXA_4 (open circles) and LXB_4 (closed circles), followed by nonlinear regression analyses. The calculated EC_{50} for LXA_4 was 631.0 nM with an efficacy of 0.89, and LXB_4 was 39.2 nM with an efficacy of 0.81 (n=3/point, bars are S.E.M.).

Supplementary Figure 5



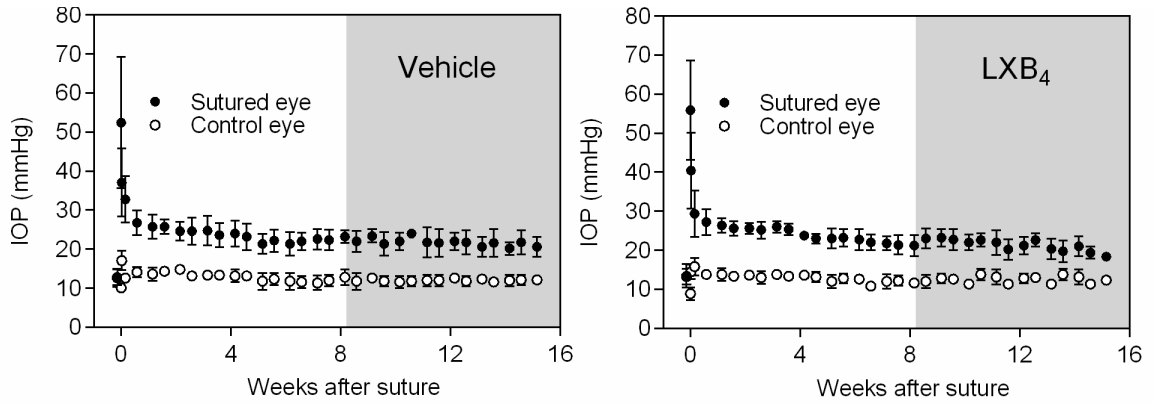
Supplementary Figure 5. LXB_4 treatment inhibits glutamate induced mitochondrial activity. A) Representative images of HT22 cells treated with vehicle or 1 μM LXB_4 and then challenged with glutamate, followed by staining with MitoTracker Red. LXB_4 blocked the glutamate induced increase in mitochondrial membrane potential, indicated by increased fluorescence (Scale bar = 20 μm). B) Quantification of fluorescent intensity per cell (n=3, *$p<0.05$, **$p<0.01$, bars represent S.E.M.)

Supplementary Figure 6



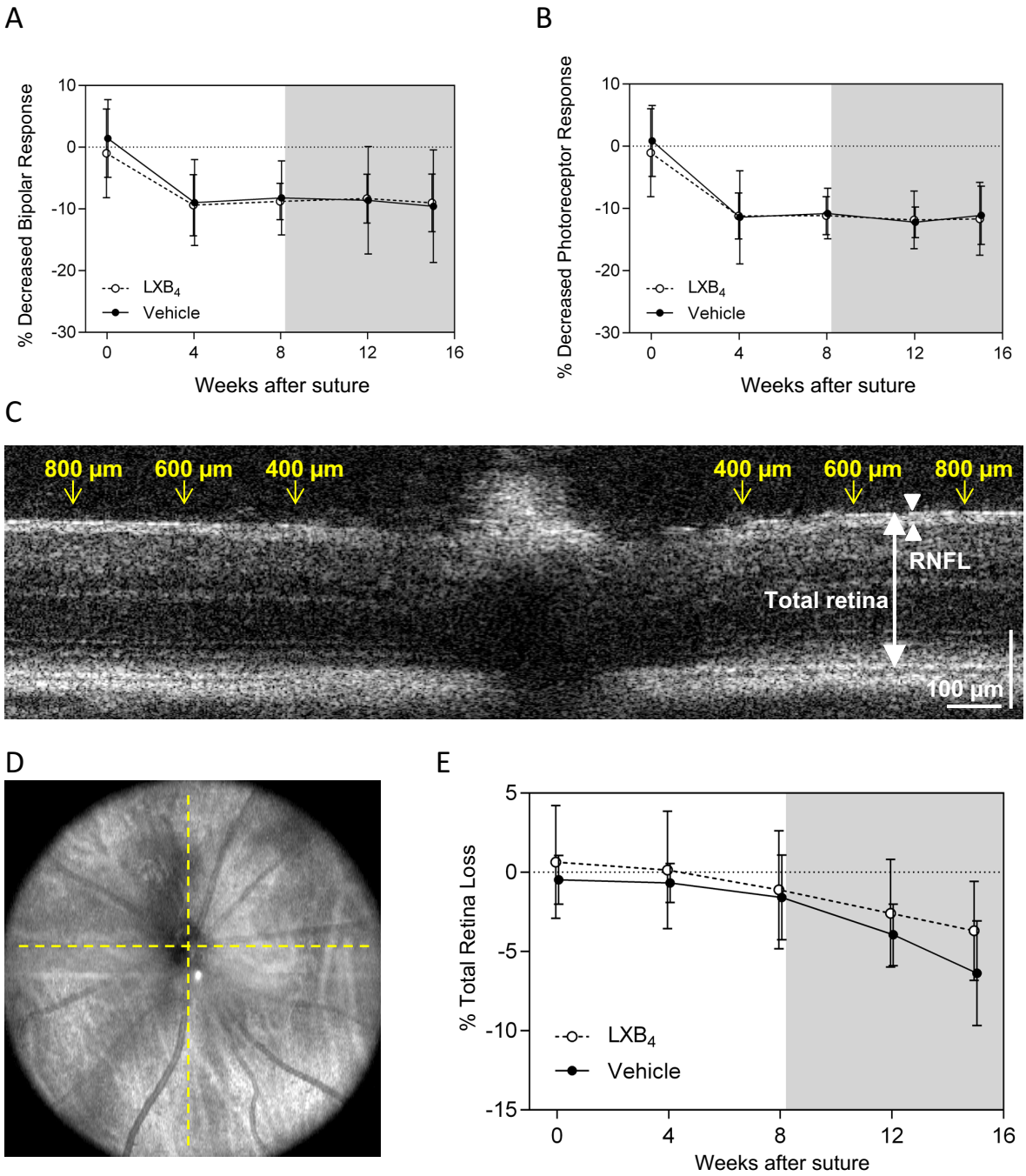
Supplementary Figure 6. Lipoxins rescue RGC survival and reduce neurite disintegration under serum deprivation. (A) Primary RGCs labeled with β3-tubulin RGC are dramatically reduced after 48 hours of serum and supplement deprivation (SD+Veh), but the loss is rescued by treatment with 1μM LXA_4 or LXB_4 (bar indicates 20μm). (B) Quantification of neuron survival following SD demonstrates significant rescue with LXA_4 or LXB_4 treatment (*$p<0.05$, **$p<0.01$, n=3, bars are S.E.M.). (C) Neurite degeneration following SD was strongly rescued by LXB_4, but not LXA_4 (bar indicates 20μm). (D) Quantification of intact neurite ratio shows significant rescue by LXB_4 (*$p<0.05$, n=3, bars are S.E.M.).

Supplementary Figure 7



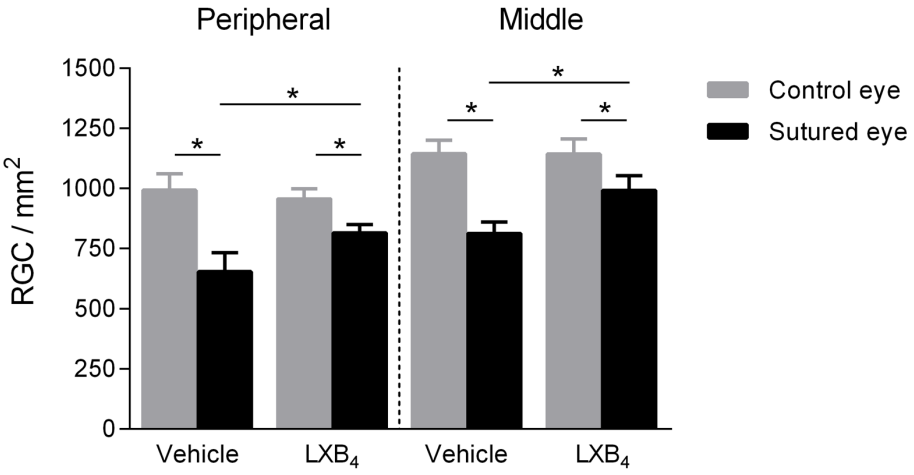
Supplementary Figure 7. LXB_4 treatment had no effect on IOP. IOPs were measured twice weekly throughout the suture model study by rebound tonometry. The shaded area indicates the period of LXB_4 or vehicle treatment (n = 8 for each group; error bars = SD).

Supplementary Figure 8



Supplementary Figure 8. IOP injury and LXB_4 rescue were specific to the inner retina. A) LXB_4 treatment had no effect on the mild bipolar cell dysfunction induced by sustained IOP (n=8, bars are S.D., the shaded area represents the period of treatment). B) LXB_4 treatment had no effect on the mild photoreceptor dysfunction induced by sustained IOP (n=8, bars are S.D., the shaded area represents the period of treatment). C) Representative OCT b-scan showing RNFL and total retinal measurements, and indicates the sampling protocol (400, 600 and 800 um from ONH in 4 quadrants, an average of 12 readings). D) Representative retinal en-face a-scan. E) A mild decrease in total retinal thickness was not significantly affected by LXB_4 treatment compared to vehicle (n=8, bars are S.D., the shaded area represents the period of treatment).

Supplementary Figure 9



Supplementary Figure 9. Raw RGC Counts From Suture Experiment. Total RGCs/mm2 are presented in control vs sutured eyes after treatment with vehicle or LXB4 (n=8, *p<0.05, bars are S.E.M.)