Supplementary Figure 1. The percentage area of the fundus image occupied by hemorrhage: At 3w percentage of the fundus view occupied by hemorrhage ranged from 0.3% up to 52%. Mean ± SEM.
Supplementary Figure 2. The clinical appearance of the mouse eye as seen using Micron III retinal fundus imaging, at various recovery times after P0-P7 hyperoxia-exposed mice. Left column - brightfield (BF) mode; middle column - fluorescein angiography (FA) mode focused on the retinal vessels; left column – FA focused on the hyaloid vessels. Note the vitreous hemorrhages at 3 weeks. From week 5 onwards the eyes featured retinal detachments (arrowheads) and focal
degenerative changes (pale focal areas) together with the highly tortuous retinal vessels and persistent hyaloid vessels at all time points.
Supplementary Figure 3. Control/normoxia mouse fundus images at 3, 5, 8, 20 and 40w. Imaged as in Figure 1. No FA of the hyaloid vasculature was photographed at 40 weeks however occasionally a single straight hyaloid artery is variably present (Arrow). Note normal regression of the hyaloid after 3w and the normal radial arrangement of retinal arteries.
and veins with non-tortuous profiles and normal dichotomous branching. No evidence of any form of retinal degeneration was observed in any control mice.

Supplementary Figure 4. P0-P7 hyperoxia mice at 3w (left) and 40w (right). Note the shared cardinal features of retinal detachment (white arrowheads) and leakage of fluorescein from peripheral neovascular fronds of capillaries (red arrows).
Supplementary Figure 5. Vitreal opacities (A) and Retinal thickness (B) identified using SD-OCT in control and hyperoxia-exposed mice (65% O2 P0-7) at 8w and 20w. Correlation between photoreceptoral function (P3) and retinal thickness is poor (C) at 20 weeks (p=0.21). Stronger correlations were observed between photoreceptor (D, p<0.001), bipolar cell (E, p=0.001) and ganglion cell (F, p=0.003) function and vitreal opacities at 20 weeks. (G) Resin section (H&E) of the retina, optic nerve head (ONH), vitreous and lens in a 40w old mouse eye that had been exposed to 65% O2 between P0-P7. Note the persistent hyaloid vessels emerging from the ONH, traversing the vitreous cavity and surrounding the lens (arrowheads). These vessels normally regress around 3w postnatally. (H) Summary of the percentage area of avascular peripheral retina in control and experimental mice (3w and 5w, n=5 in both control and experimental groups; 8w, controls n=5, hyperoxia-exposed n=3; 20w, controls n=3, hyperoxia-exposed n=4). * p<0.05, ** p<0.01, *** p<0.001 (one-tailed t-test).