Fig. S1. **Enhanced expression of endoglin during oxygen-induced Ischemic retinopathy (OIR).** Retinal frozen sections prepared from P12 and P15 Eng +/+ mice kept in normal air or exposed to OIR (5 days of high oxygen (P12); or 5 days of high oxygen and 5 days of normal air (P17)) were stained with anti-endoglin (×100). Please note strong endoglin staining of retinal vasculature in P17 retinas during OIR, when maximum retinal neovascularization occurs. These experiments were repeated three times with eyes from three different mice.

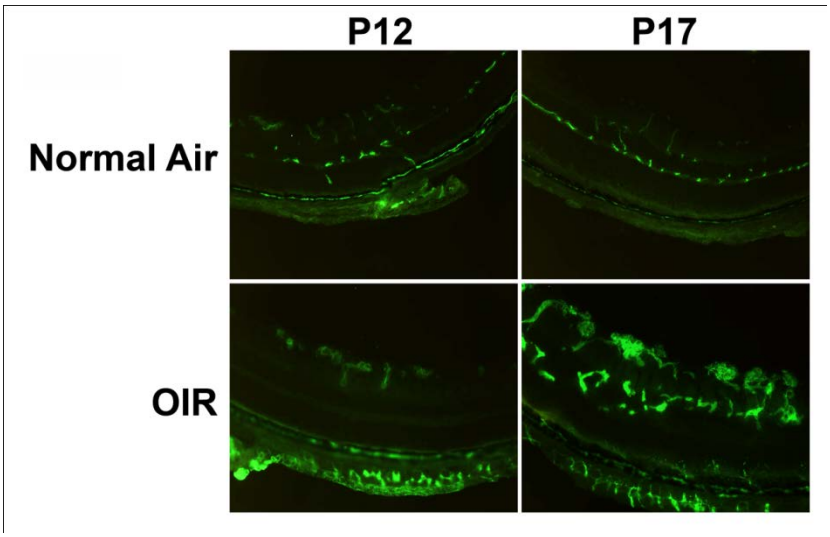
Fig. S2. **Postnatal retinal vascular development in Endoglin +/− mice.** Wholemount retinas were prepared from Eng +/+ (**A**,**C**) or Eng +/− (**B**,**D**) mice and stained with anti-collagen IV to visualize retinal vasculature. A,B: 5-day-old mice (×25). C,D: 21-day-old mice (×25).

Fig. S3. **Enhanced proliferation of retinal vascular cells in Eng+/- mice.** 10-day-old Eng+/+ (**A**) and Eng+/− (**B**) mice were injected with 5-bromo-2-deoxyuridine (BrdU; 0.12 g/kg body mass) and sacrificed 1.5 h later. Wholemount retinas were stained with collagen IV (red) and BrdU (green; ×400). (**C**) Bars indicate mean number of BrdU positive nuclei per whole retina (**P<0.01; n=5). These experiments were repeated with eyes from at least 5 different mice with similar results.

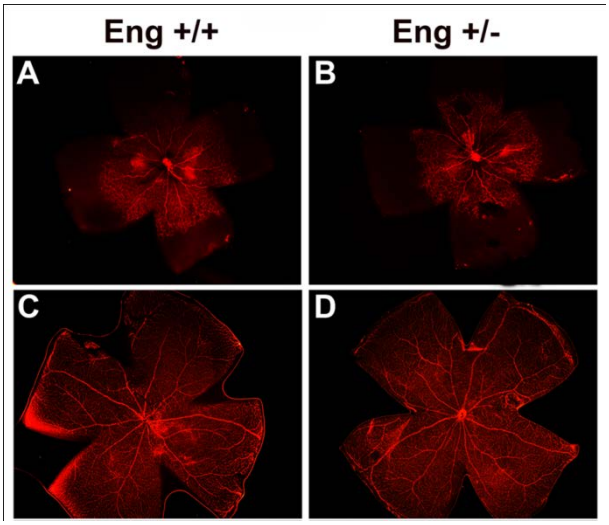
Fig. S4. **Expression of integrins in retinal EC.** α1-, α2-, α3-, α5-, αV-, β1-, β3-, β8-, α5β1- , and αVβ3-integrin expression on retinal EC was determined by FACS. These experiments were repeated with two different isolations of EC with similar results.

Fig. S5. **Expression of EC markers, ZO-1, and TGFβ receptors in the retinas.** (**A**) The expression levels of PECAM-1, VE-cadherin, ICAM-2, ZO-1, TGFβRII, and ALK5 in retinal lysates prepared from 4-week-old Eng+/+ and Eng+/− mice were determined by western blot analysis. (**B**) The relative protein levels were quantified as described in the Methods *(*$P<0.05$, n=3; **$P<0.01$, n=3; ***$P<0.001$, n=3)*. (**C**) VEGF levels in the retinas was determined using an ELISA system *(**$P<0.01$*, n=3).

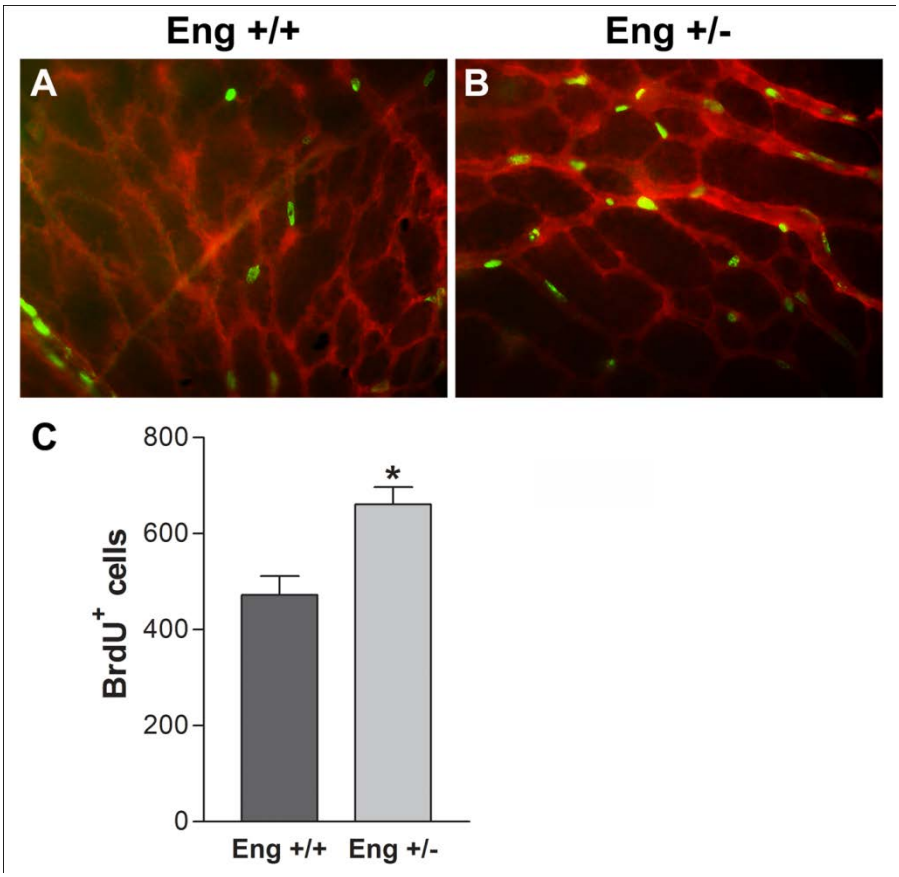
Supplemental Fig. 1



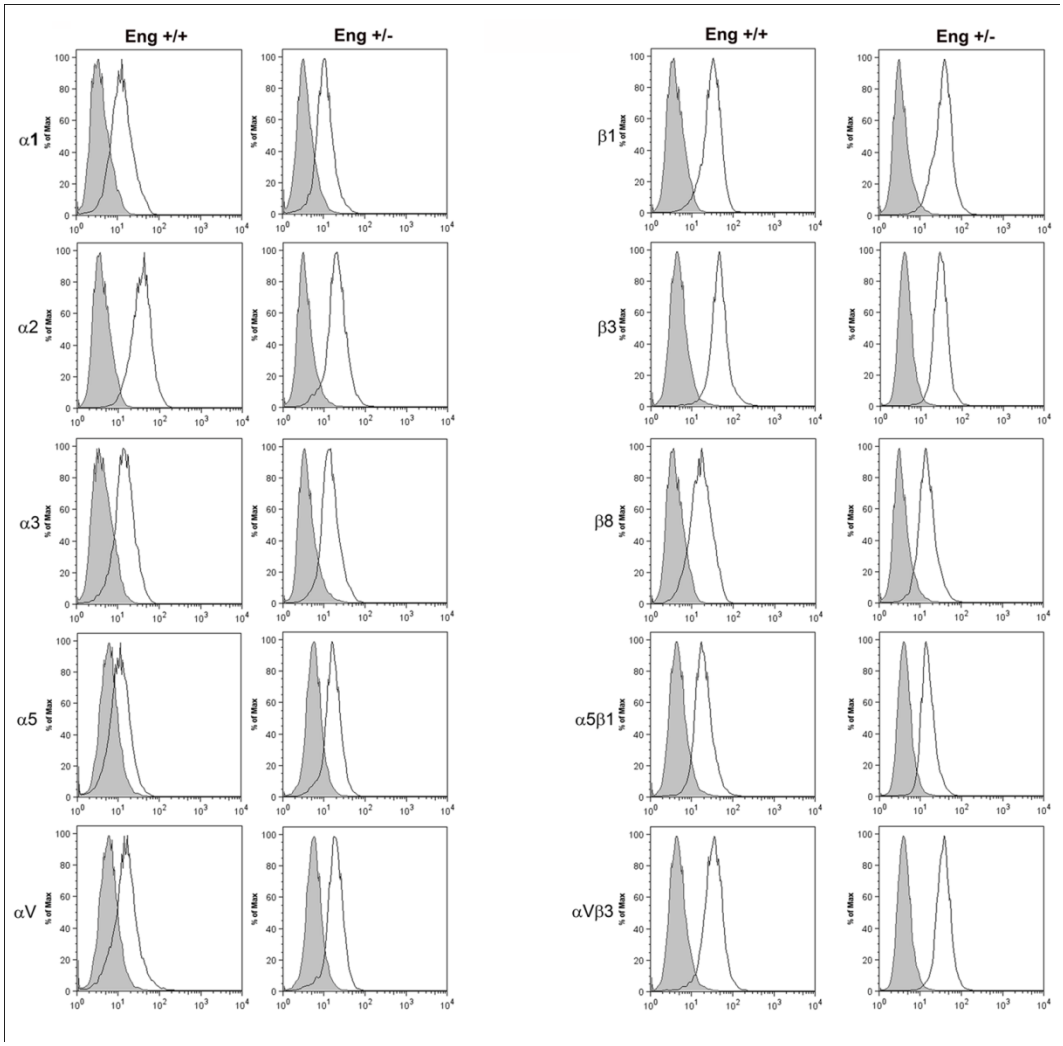
Supplemental Fig. 2



Supplemental Fig. 3



Supplemental Fig. 4



Supplemental Fig. 5