**Supplementary Figure 1.** Identification of PPARα expression in the retina. Normal rat retinal sections were immunostained with antibodies for PPARα (green) and GFAP (red). Significant immunosignals of PPARα were detected primarily in the inner retina. Some of the signals overlap with GFAP staining, suggesting it is likely expressed in retinal Müller cells.

**Supplementary Figure 2.** A PPARα antagonist blocks the fenofibrate-induced down-regulation of VEGF and ICAM-1 in REC. A: Western blot analysis of VEGF and ICAM-1 in REC exposed to a high glucose (30 mM) medium for 24 hours and then treated separately with fenofibrate (50 µM) and GW7647 (50 nM), another PPARα agonist, with or without a PPARα antagonist GW6471 (10 µM) for 12 hours. Levels of ICAM-1, and VEGF in total cell lysates were determined by Western blot analysis with β-actin as a loading control.
**Supplementary Figure 3.** Plasma triglyceride levels in Akita models. Plasma total triglyceride (TTG) and free triglyceride (FTG) from age of 3 month-old Akita mice fed without or with fenofibrate (120 mg/kg/d, 4 weeks) were measured and compared with those from their age matched non diabetic control following the manufacturer’s recommended procedures (Serum Triglyceride Determination Kit, Sigma, St. Louise, MO). **P<0.01 vs. wt mice (mean±SD, n=7).**

**Supplementary Figure 4.** Fenofibrate does not alter body weight and blood glucose in STZ-induced diabetic rats. Diabetes was induced in adult rats (6-wk-old) by an STZ injection. One week after the onset of diabetes, the rats were treated orally with fenofibrate. Body weight (A) and blood glucose levels (B) were measured prior to the fenofibrate treatment and at 3 and 6 weeks of treatment (mean±SD, n=27).
Supplementary Figure 5. Immunoblotting of PPARα to show the specificity of the anti-PPARα antibody. PPARα was knocked down in ARPE19 cells by transfection of a specific siRNA of human PPARα (lanes 4-6), with the cells transfected with control siRNA for control (lanes 1-3). PPARα over-expression was achieved in ARPE19 cells by transfection with a plasmid expressing human PPARα with DDK1-Myc tag (lanes 7-9). Levels of PPARα in total cell lysates were determined by Western blot analysis. The antibody recognizes a dominant band, which is decreased by siRNA of PPARα, and increased by PPARα over-expression. 