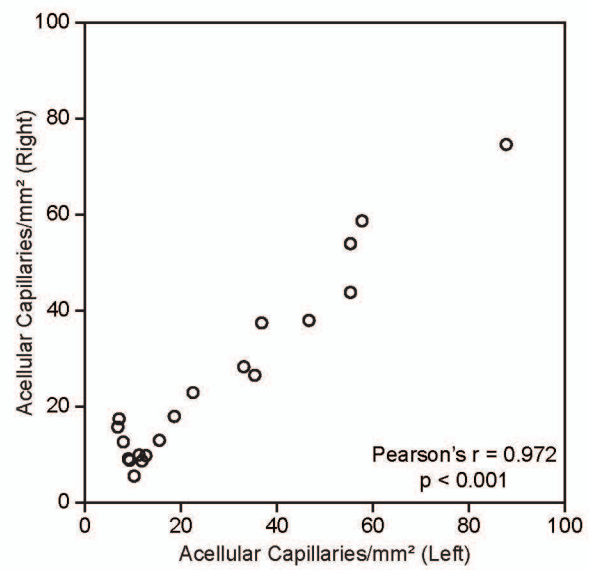




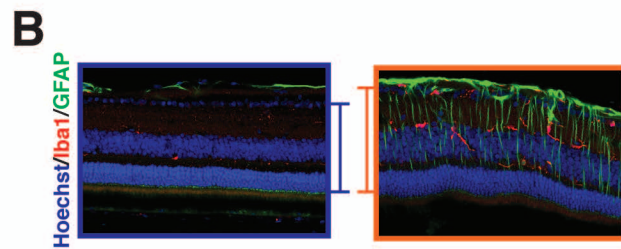
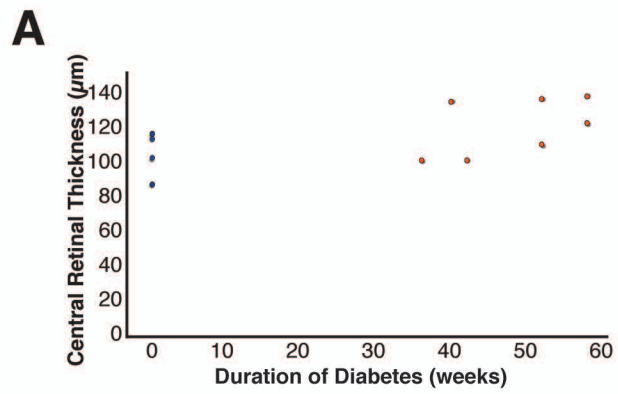
**Supplementary Figure 1**

Retinal trypsin digest of a diabetic retina. This high resolution image allows viewers to zoom in for better observation of microvascular abnormalities in the diabetic Nile rat retina.



**Supplementary Figure 2**

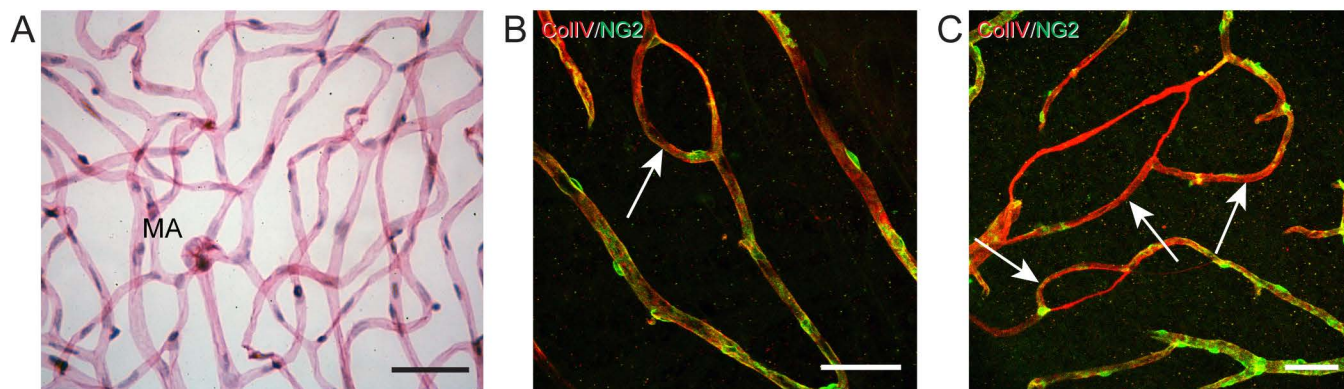
The relationship between the acellular capillary counts in both eyes of diabetic Nile rats. The number of acellular capillaries is highly correlated between the left and right eyes. Pearson's  $r = 0.972$ ,  $p < 0.001$ .  $N = 42$  trypsin digested retinas.



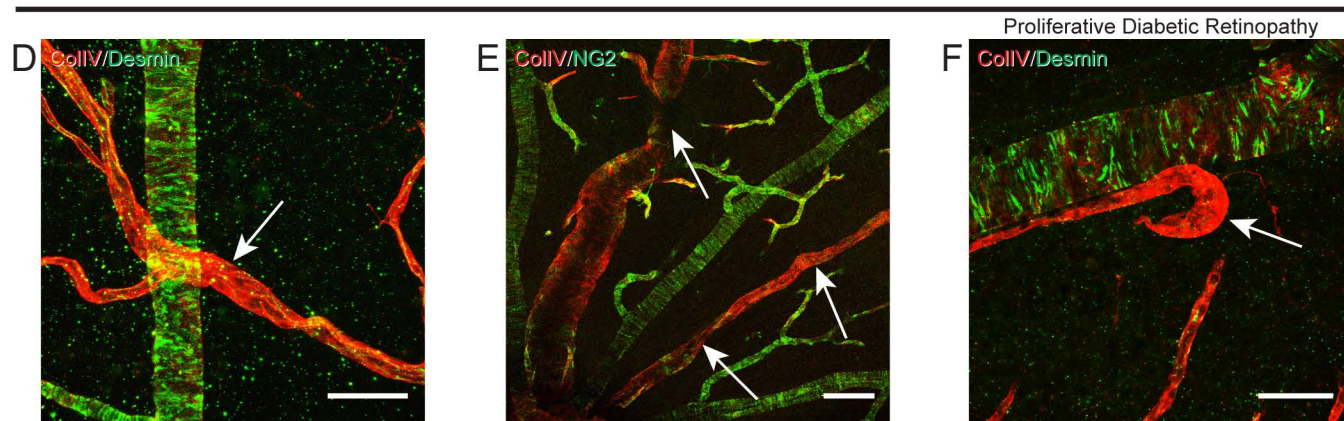
**Supplementary Figure 3**

A: Average central retinal thickness of 4 control retinas and 7 diabetic retinas. Orange dots = diabetic retinopathy. Blue dots = control. B: Micrographs of representative control retina on the left and diabetic retina with increased central retinal thickness on the right. Orange outline = diabetic retinopathy. Blue outline = control.

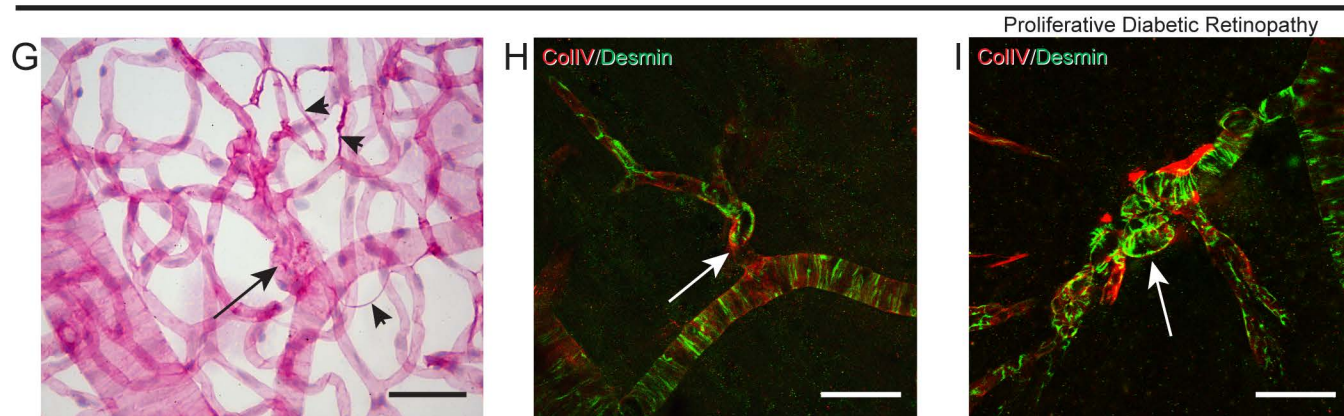
### Capillary Abnormalities



### Venular Abnormalities

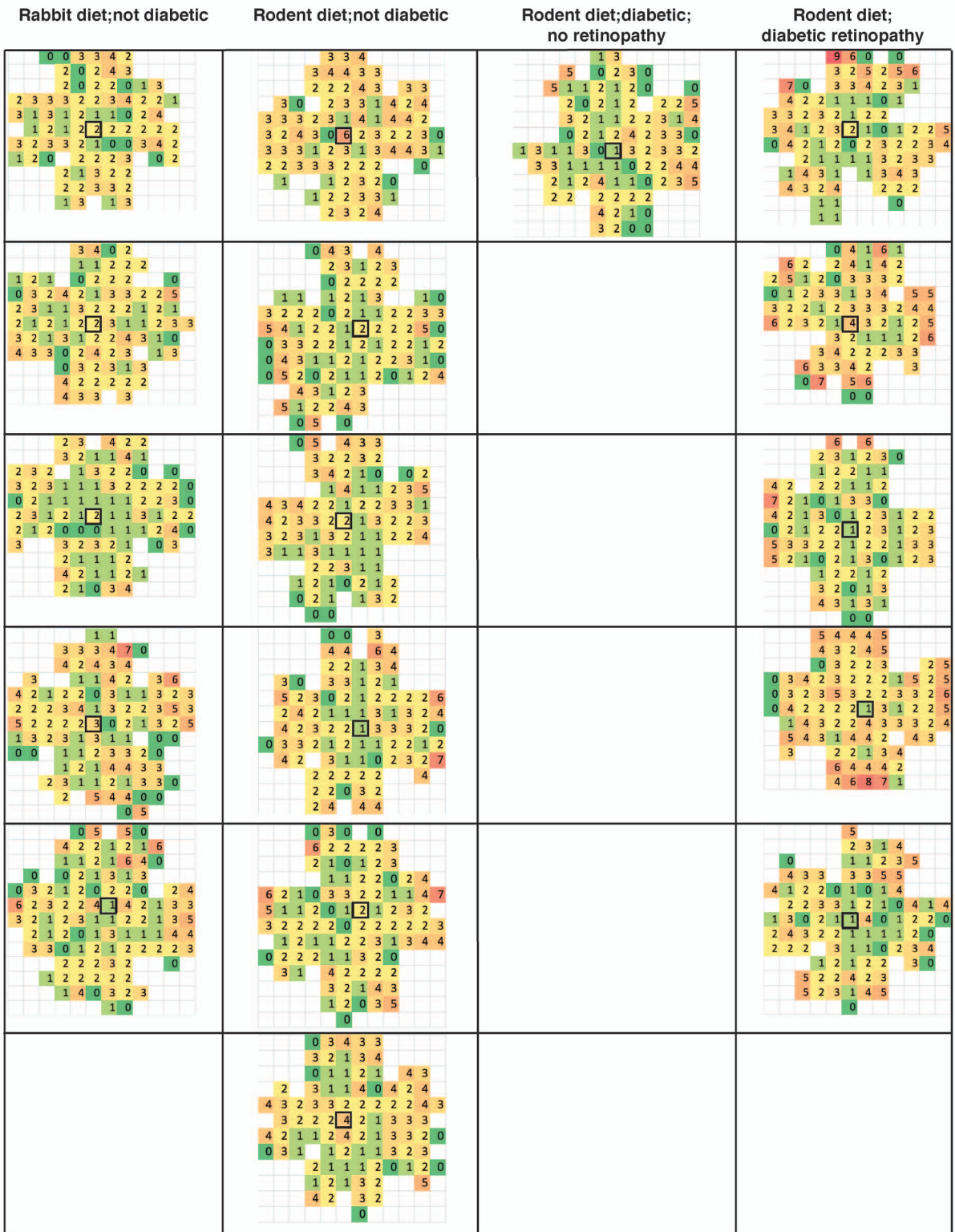


### Arterial Abnormalities

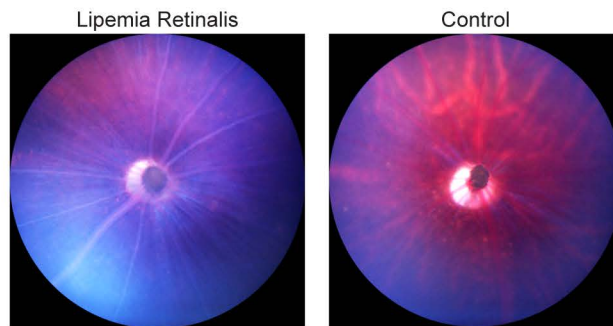


#### Supplementary Figure 4

Range of vascular abnormalities in the retinas of diabetic Nile rats. Capillary abnormalities are shown in panels A-C. A: MA = microaneurysm. B and C: Arrows = capillary re-duplication, where the alternate branch appears to be degenerated. Venular abnormalities are shown in panels D-F. D: Arrow = venular dilation. E: Venular beading and/or uneven vessel caliber; arrows point to constricted areas of the vessels. F: Arrow = venular occlusion. Arterial abnormalities, specifically tortuous arterioles are shown in panels G-I. Scale bar = 50  $\mu$ m.



**Supplementary Figure 5**  
 Retinal microglial cell distribution of 32 to 40 week old Nile rats. An outline of the clover-shaped flatmount retinas, using 4 deep cuts and 4 shallow cuts, was traced on the StereoInvestigator system (MBF). The numbers represent the number of Iba1 positive microglial cells in a sampled field within a sampling grid. The black outline marks the sampling grid nearest the optic nerve head. This information is then plotted on an Excel spreadsheet and a heat map was generated using the counts within the sampled field.



**Supplementary Figure 6**

Fundus photograph of diabetic Nile rat with lipemia retinalis. The central retinal vessels emanating from the optic nerve head are almost white, compared to the normal red color of healthy blood vessels. Age-matched control is on the right.