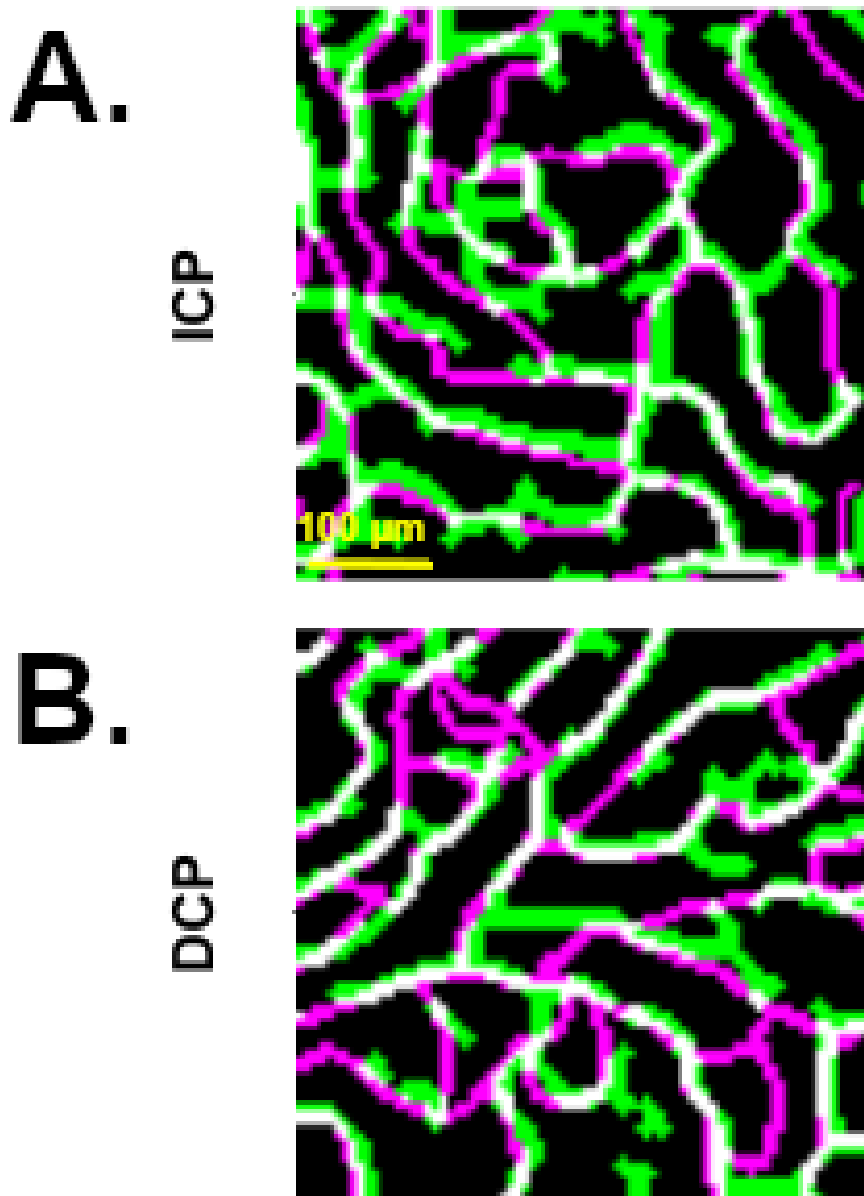


Supplementary figure S1. Main image processing steps performed to vascular flow and vascular structure to obtain the enhanced retinal vascular network. Image processing was applied in raw data obtained from High-Resolution Optical Coherence Tomography Angiography (flow data and structural data). Image processing was done volumetrically. To illustrate the image processing steps a bi-dimensional image of an *en face* visualization of the deep capillary plexus (DCP) will be used. (A-C)

Vascular flow volume was processed using a projection artifact removal (PAR) algorithm (A), followed by contrast enhancement using contrast-limited adaptive histogram equalization (B) and, finally, bi-dimensional (2D) Gaussian filtering ($\Sigma = 0.7$) and Kalman filtering (prediction bias = 0.50 and noise estimate = 0.50) (C). White arrows point to a blood vessel projection removed after PAR. (D-G) Structural volume was processed using a compensation operator for light attenuation (that reduced artifacts from blood vessel shadowing) (E), followed by a denoising algorithm (Block-matching and three-dimensional filtering) (F). Finally, morphological (top-hat filtering) and orthogonal (principal component analysis) transformations were applied, followed by CLAHE, 2D Gaussian and Kalman filtering (using the above-mentioned parameters) (G). OCT-A and structural OCT processed images were merged with different percentual contributions in the construction of superficial vascular plexus (SVP) and deep vascular complex (DVC), i.e. in the SVP, OCT-A accounted for 100% of the data; for the DVC, structural OCT processing accounted for 80% of the data. (H-L) *En face* slabs of the 3 vascular plexuses (SVP, intermediate capillary plexus (ICP) and DCP) and the connecting vessels (CV1 and CV2) between them are shown and illustrate bi-dimensionally the results obtained after this process. Scale-bar: 100 μm



Supplementary figure S2. Quantitative evaluation of rendering quality. Images obtained for the intermediate capillary plexus (A, ICP) and deep capillary plexus (B, DCP) using the algorithm employed (green) were superposed with images obtained after manual segmentation performed by an independent grader (magenta). The accuracy rate was calculated according to the percentage of superposition between green and magenta images (white; $78\pm 4\%$ for the ICP and $75\pm 5\%$ the DCP).