High-resolution, depth-resolved vascular leakage measurements using contrast-enhanced, correlation-gated optical coherence tomography in mice: supplement

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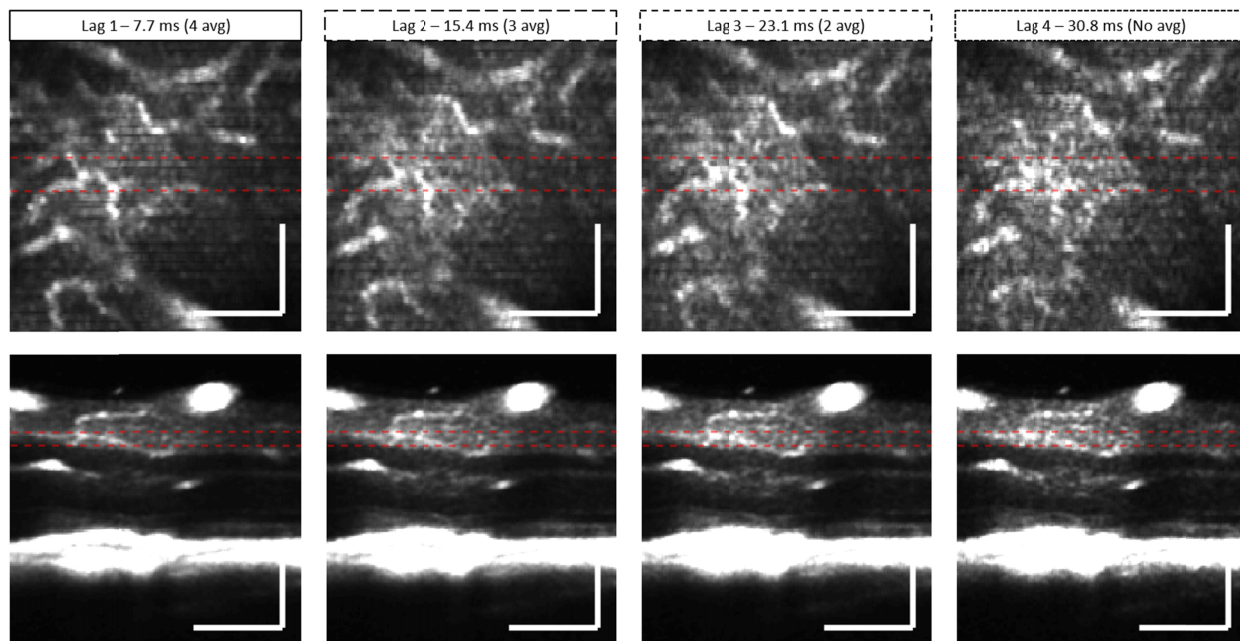**conrad.merkle@meduniwien.ac.at*

Fig. S1. Zoomed-in view of the leakage region of interest presented in Fig. 2. Mean intensity projections of angiogram signals at different interscan times are shown over 40 μm laterally or 20 μm axially as denoted by the dotted red lines in the enface and B-scan images. Scale bars are 100 μm and all figures are shown with the same dynamic range.
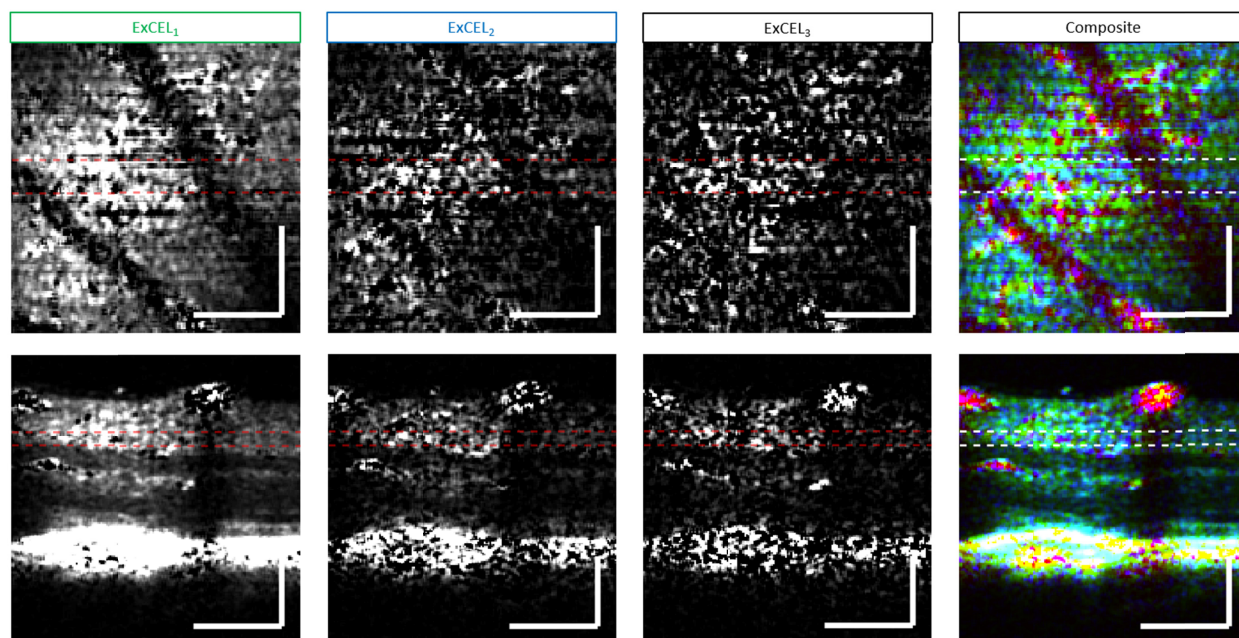

Fig. S2. Zoomed-in view of the leakage region of interest presented in Fig. 3. Mean intensity projections of ExCEL signals with different decorrelation gates are shown over 40 μm laterally or 20 μm axially as denoted by the dotted red or white lines in the enface and B-scan images. A false-color composite image combines the traditional angiogram (red), $ExCEL_1$ (green), and $ExCEL_2$ (blue) signals. Scale bars are 100 μm and all grayscale figures are shown with the same dynamic range.
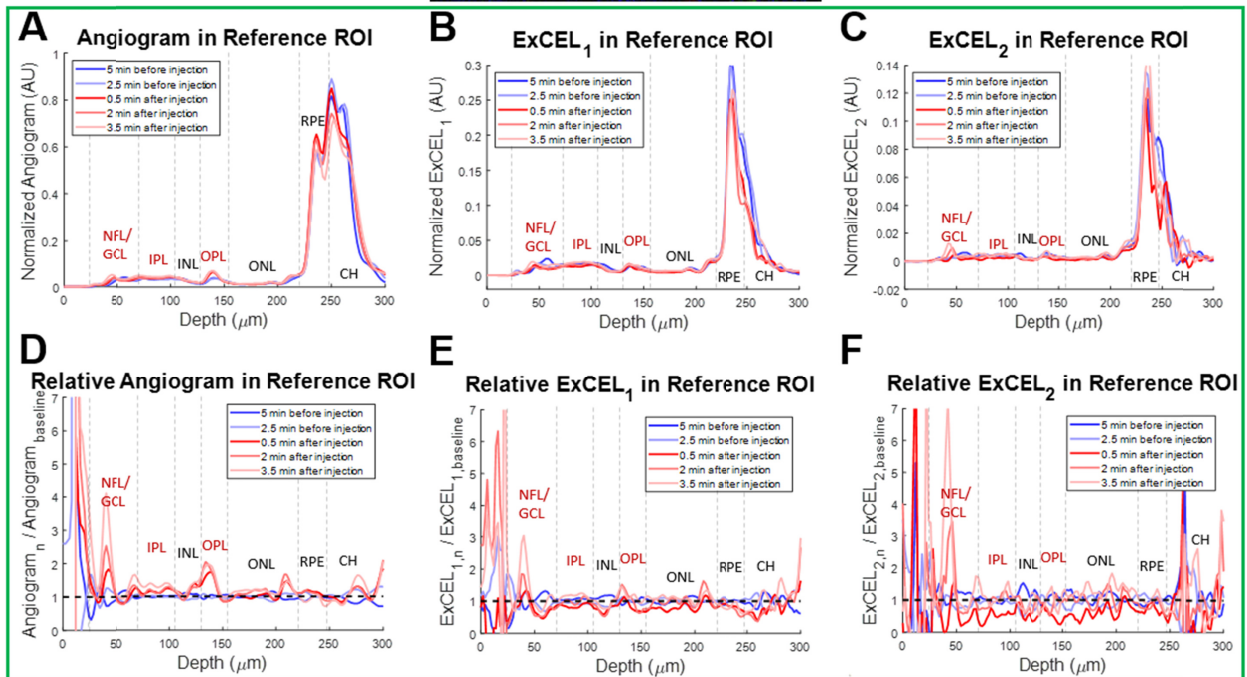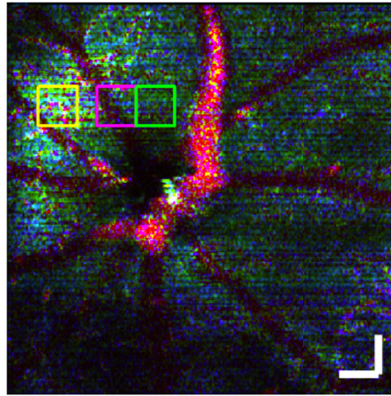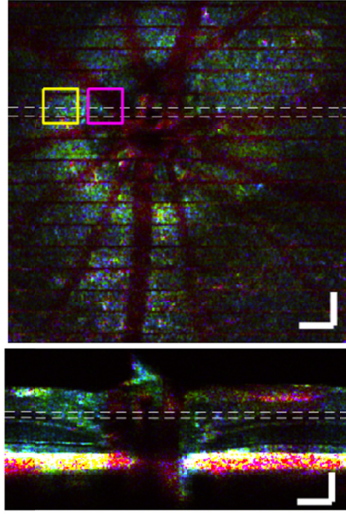
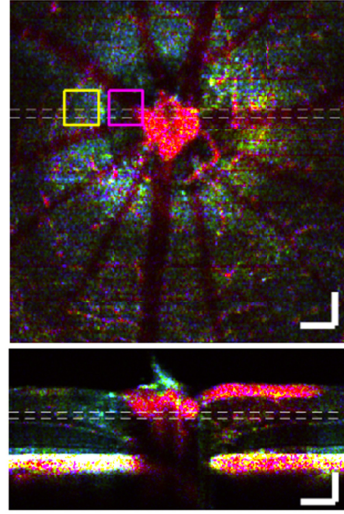Fig. S3. Depth profiles from a VLDLR mouse eye for the traditional angiogram (A), ExCEL$_1$ (B), and ExCEL$_2$ (C) signals averaged over the 100 μm × 100 μm reference region without apparent leakage or large vascular contributions shown in the false-color image above (green box). Yellow and Magenta boxes mark the positions of depth profiles shown in Figs. 5 and 6 respectively. Relative changes in signals (D-F) were also measured by dividing by the mean baseline profile. Blue profiles were acquired before Intralipid injection and red profiles were acquired after injection. These profiles demonstrate only minor changes in angiogram signal and no apparent changes in ExCEL signals following injection of the lipid tracer. Relative angiogram changes are not as large as those presented in Fig. 6D due to the relatively large ROI area and lower volumetric vascular density. NFL – Nerve Fiber Layer, GCL – Ganglion Cell Layer, IPL – Inner Plexiform Layer, INL – Inner Nuclear Layer, OPL – Outer Plexiform Layer, ONL – Outer Nuclear Layer, RPE – Retinal Pigment Epithelium, CH – choroid. Vascular layers of the inner retina are labeled in red.
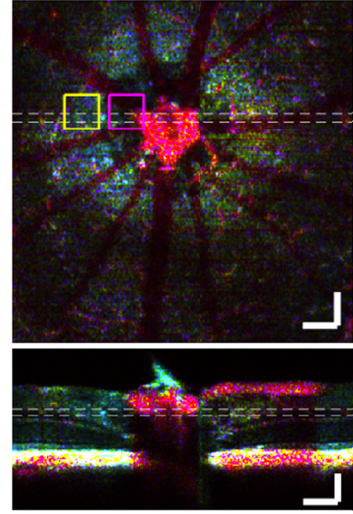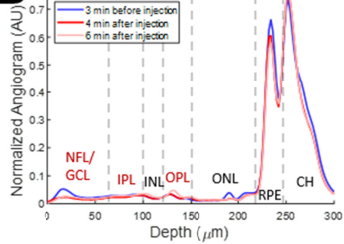
A

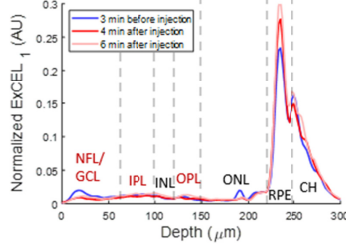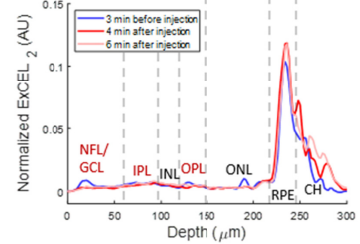3 Minutes Pre Injection   4 Minutes Post Injection   6 Minutes Post Injection
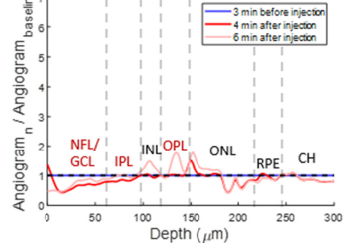
B

Angiogram in Artefact ROI
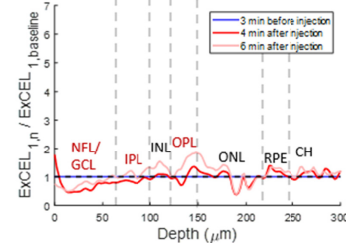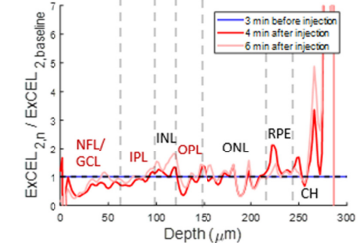
ExCEL₁ in Artefact ROI

ExCEL₂ in Artefact ROI

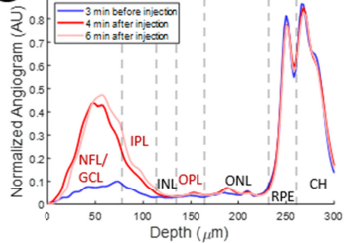Relative Angiogram in Artefact ROI

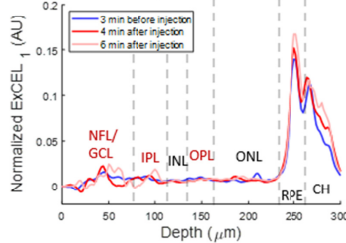Relative ExCEL₁ in Artefact ROI
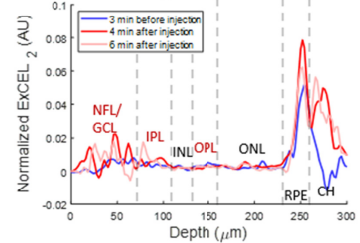
Relative ExCEL₂ in Artefact ROI
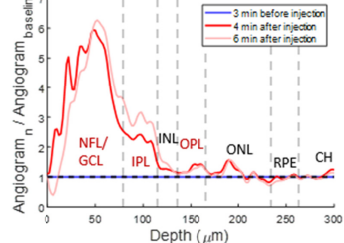
C

Angiogram in Vascular ROI
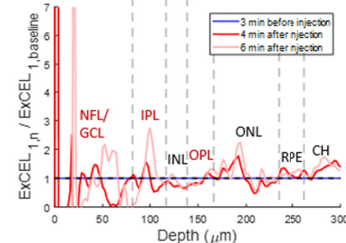
ExCEL₁ in Vascular ROI

ExCEL₂ in Vascular ROI

Relative Angiogram in Vascular ROI

Relative ExCEL₁ in Vascular ROI
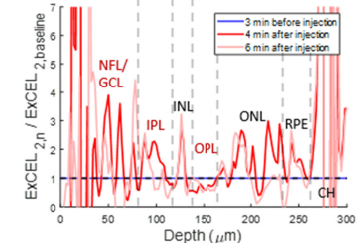
Relative ExCEL₂ in Vascular ROI

Fig. S4. Leakage volume cross sections (A) and depth profiles (B-C) from a wild type mouse eye at multiple time points for the traditional angiogram, $ExCEL_1$, and $ExCEL_2$ signals. Signals were averaged over 100 μm × 100 μm reference regions containing ExCEL signal artefacts (B, yellow box in A) or large vascular contributions (C, magenta box in A). Relative changes in signals were measured by dividing by the pre-injection depth profile. Blue profiles were acquired before Intralipid injection and red profiles were acquired after injection. False coloring of the leakage volume follows the same format as the main text where the angiogram signal is red, and $ExCEL_1$ and $ExCEL_2$ signals are coded green and blue respectively. Leakage imaging (A) shows a ring-shaped artefact surrounding the optic nerve head caused by differences in retinal structure in this region. Following injection of the lipid tracer, the angiogram signal increases within blood vessels, however a difference in the surrounding regions or the ring-shaped artefact is not apparent. The quantitative depth profiles confirm this with no apparent changes in ExCEL signals following injection in either ROI and a large increase in angiogram signal within the vascular ROI (C). Depth profiles in the artefactual region are consistent with those of an ROI in the VLDLR model containing neither leakage nor large vessels (Fig. S3). NFL – Nerve Fiber Layer, GCL – Ganglion Cell Layer, IPL – Inner Plexiform Layer, INL – Inner Nuclear Layer, OPL – Outer Plexiform Layer, ONL – Outer Nuclear Layer, RPE – Retinal Pigment Epithelium, CH – choroid. Vascular layers of the inner retina are labeled in red.