

Retinal microvasculature. A comparison between experimental SEM corrosion casts observations and human in vivo “Angio-OCT” observations

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In our previous studies on vascular corrosion casts of monkey posterior retina we were able to demonstrate the following points: 1) Capillaries have a laminar distribution. Most vitreal ones are favoured as they are more directly vascularized by side branching arterioles; 2) around the foveal avascular zone, capillaries show a round course and likely function as arteriovenous anastomoses; 3) different layers of capillaries are connected by side branches of capillaries; 4) peculiar cast imprints at precapillary and capillary branching points are related to smooth muscle cells and pericytes that may perform fine blood flow regulation.

Split-spectrum amplitude-decorrelation angiography (SSADA) is an Angio-OCT that provides imaging of the retinal vasculature without the need for intravenous injection of a fluorophore. SSADA makes it possible to follow single blood vessels in different focal planes and indirectly provides data on variation of vessel volume related to blood flow.

We compared observation from our previous studies on corrosion casts in Cynomolgus monkeys with images of retinal vasculature as obtained in vivo in man by SSADA.

An extremely close relation between monkey and man retinal microvascular anatomy was demonstrated. Both number of layers of capillaries and their connections closely corresponded. Further observations in different conditions may provide definitive information about blood flow regulation sites.

References

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Keywords

Retinal blood vessels; PV-OCT; precapillary.