



S.I.E.T.O
Società Italiana di Ergoftalmologia e
Traumatologia Oculare

30°
CONGRESSO
NAZIONALE

Ultra-Widefield e Angio OCT



www.amedeolucente.it

Disclosure

Consulting Free

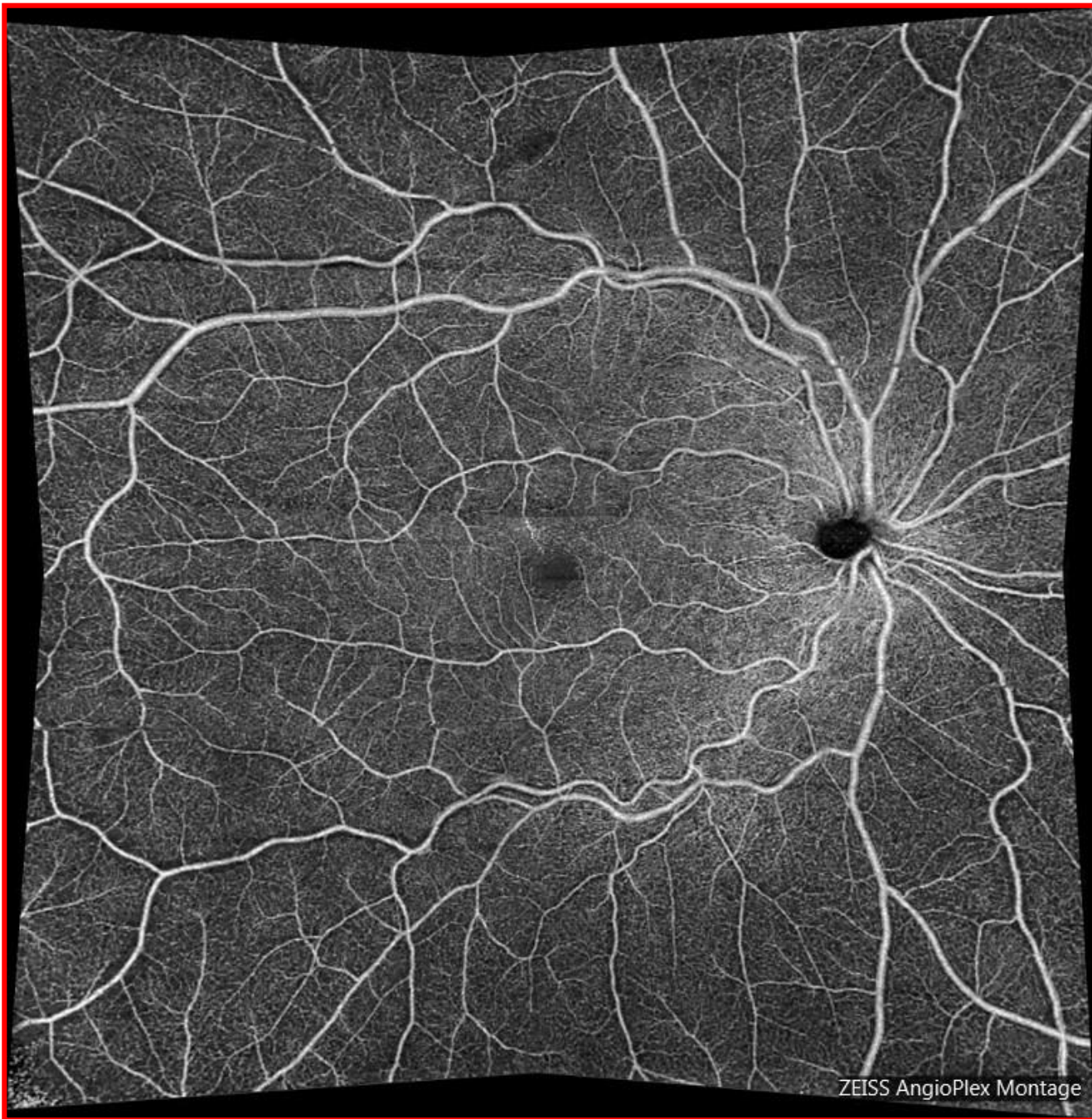
- *Carl Zeiss Meditec*
- *Alpha Intes*
- *Mesofarma*

History of Widefield

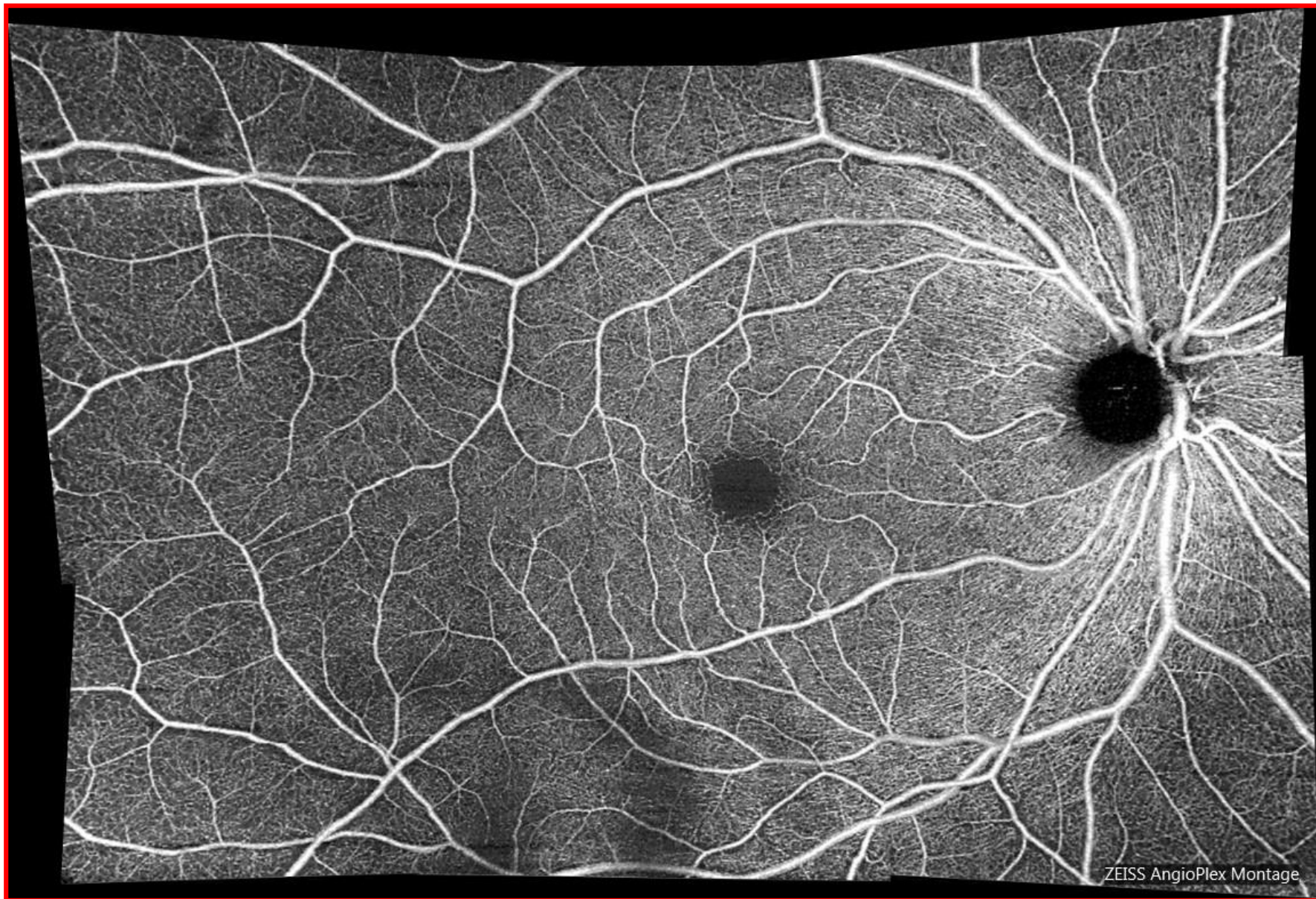
- **Equator-plus camera** developed in **1975** by Pomerantzeff. A fiber optic illumination was separated from the camera to minimize lens reflections and obtain a **148°** capture from the retina anterior to the equator.
- The **Retcam** (Clarity Medical Systems, Pleasanton, California, USA) is a portable wide-angle camera system that was made commercially available in **1997**. It is a contact-based, coaxial illumination system which obtains **130°** field of view with retinopathy of prematurity.
- **Staurengi et al.** developed a combined contact and noncontact handheld lens system coupled with a SLO. The Staurengi lens system obtained high-resolution images with a **150° field**. However, this technique was cumbersome for the photographer **2005**
- The Optos camera (**Optos 200Tx**, Dunfermline, UK) is a UWF imaging system, which produces a **200°** view of the retina (about 82% of the surface area) **2000**
- **Zeiss Clarus Widefield** (one image) **133°**, (two images) **200°**, Montage (up to six images) **267°**



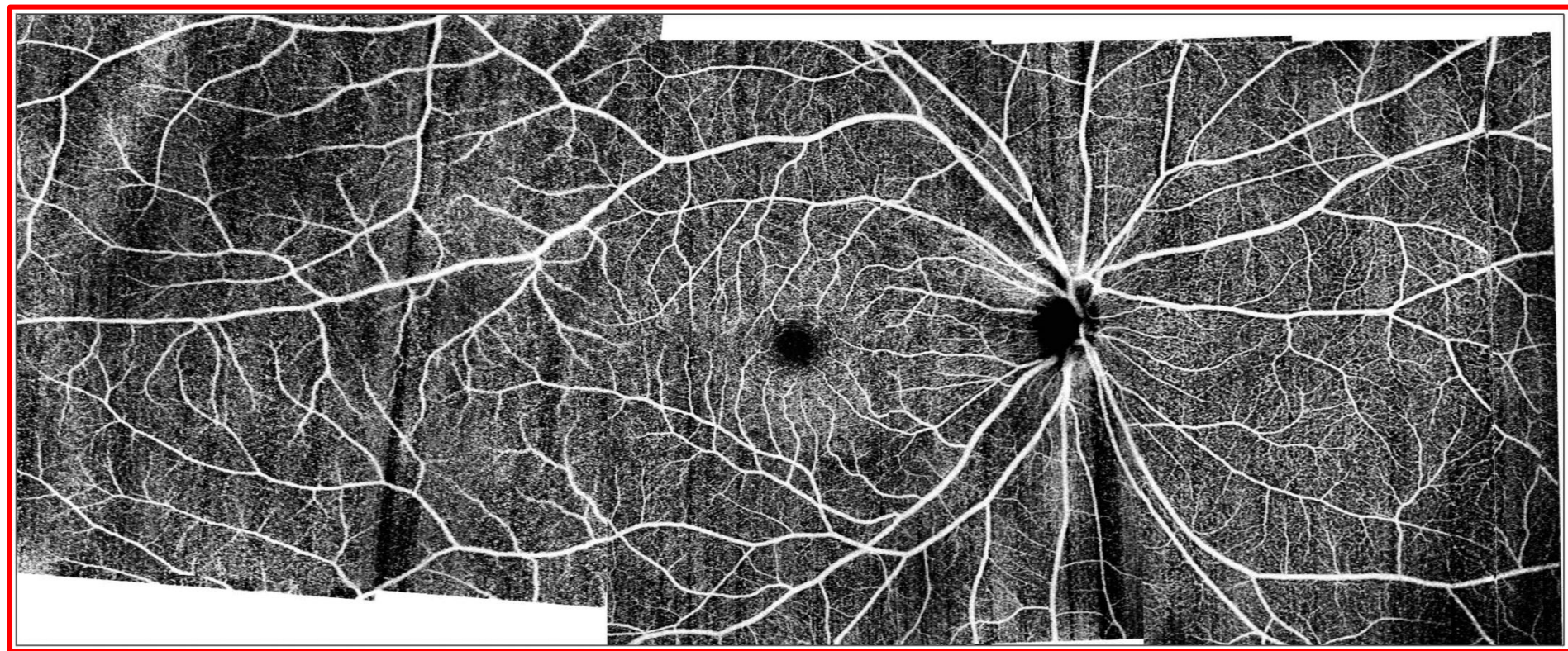
Imaging 200° Zeiss Clarus Widefield by: Amedeo Lucente



Montage
5 images
8x8mm

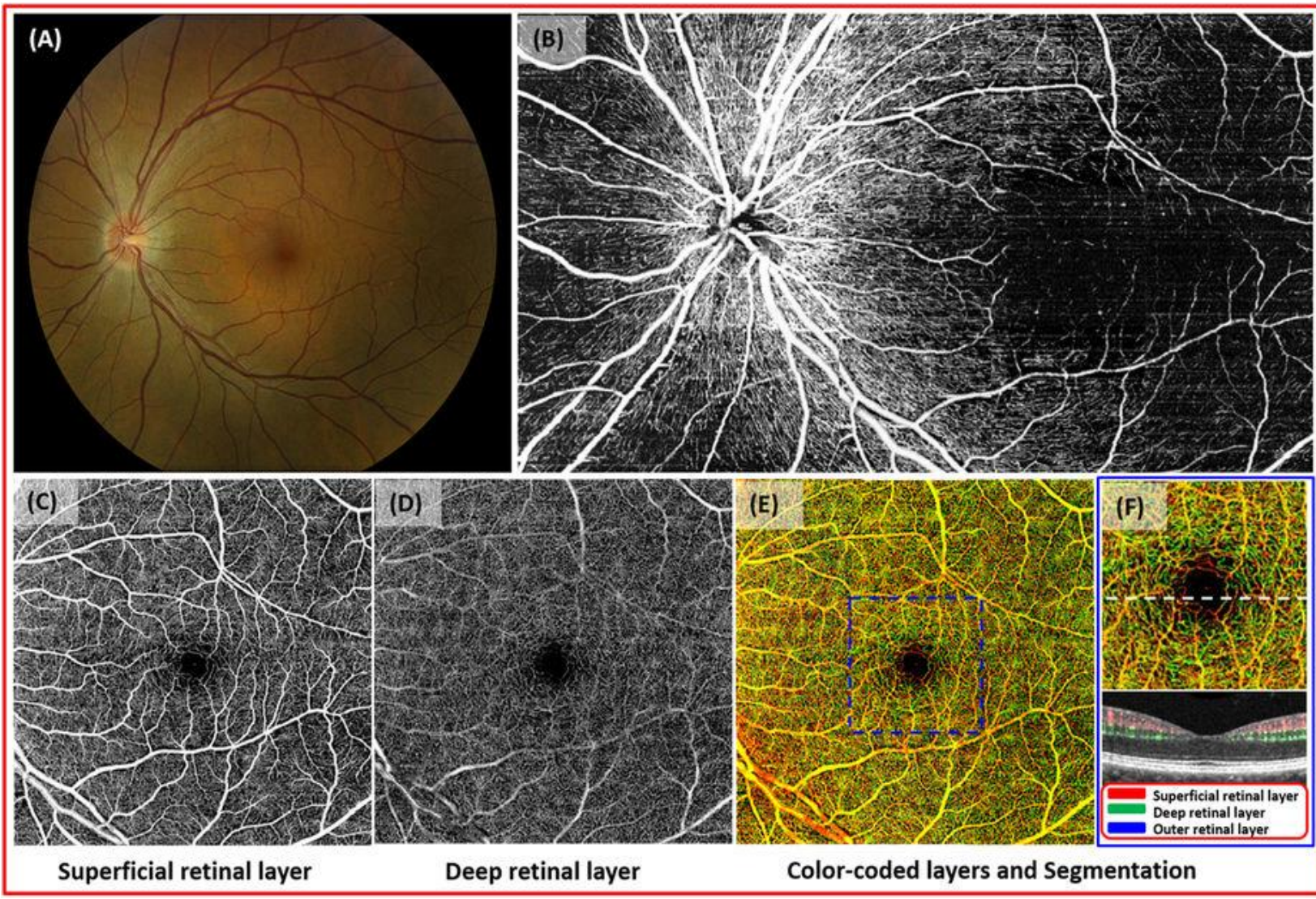


**Montage 6 images
6x6mm**



Ultra-widefield OCTA (~20-mm width, 10-mm height, 7-mm depth) of the retinal circulation generated by montaging four scans from a 200-kHz swept-source OCT system.

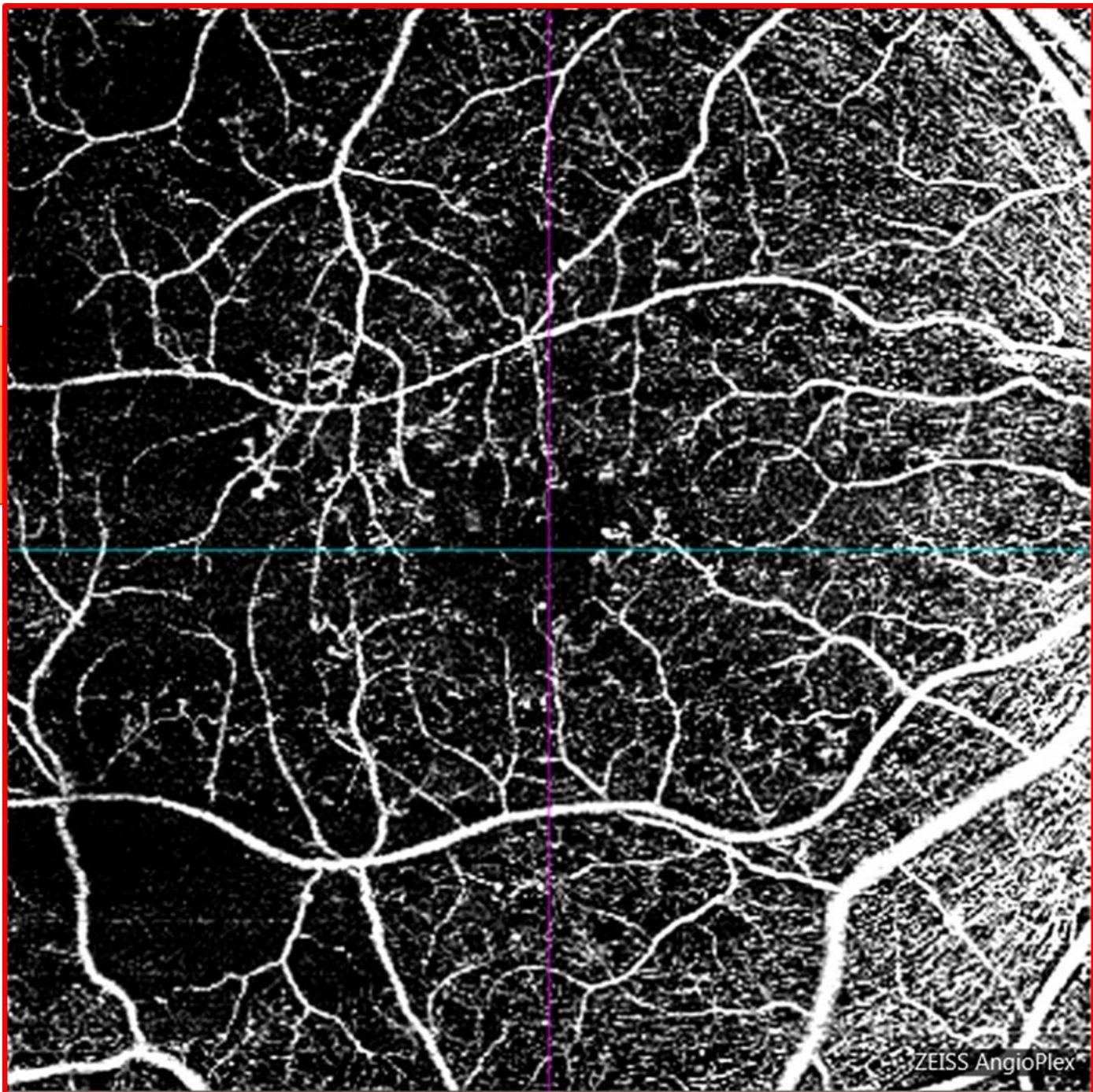
Optical Coherence Tomography based micro-angiography (OMAG) images of a 49 year-old Asian male.



(A), fundus photograph of normal retina. (B), montaged OMAG images of the nerve fiber layer. Radial pericapillary network within the nerve fiber layer is noted. (C), the superficial retinal layer (SRL) slab contains the vascular network within the ganglion cell layer and the outer plexiform layer. The arcade vessels and the fine capillaries are shown. (D), the deep retinal layer (DRL) demonstrates deeper capillary network. (E), the whole retinal layer slab composed of the SRL, the DRL, and the outer retinal layer (ORL) allows visualization of the superficial, intermediate, and deep retinal capillary plexuses. Different colors identify various levels of the retina. (F), the magnified image of the central macula (identified as in the blue box from (E)). The cross-sectional flow image of the area marked with white dashed line on the magnified OMAG image. Blood flow detected in SRL, DRL, ORL in red, green, blue, respectively. No flow is appreciated in the ORL. by Qinqin Zhang et al. Scientific Reports Published: 25 February 2016

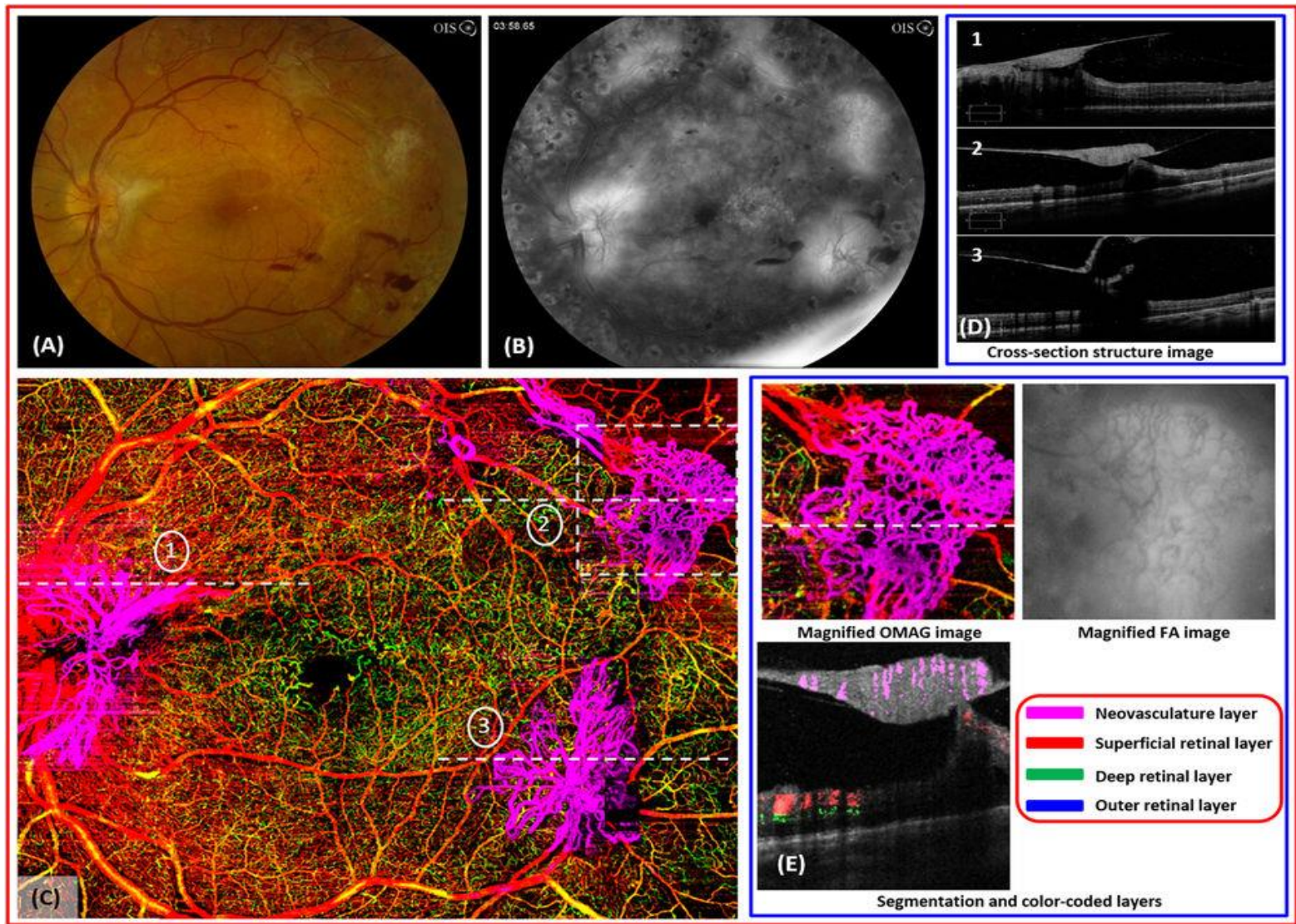
Angio-OCT
NPRD
8x8mm

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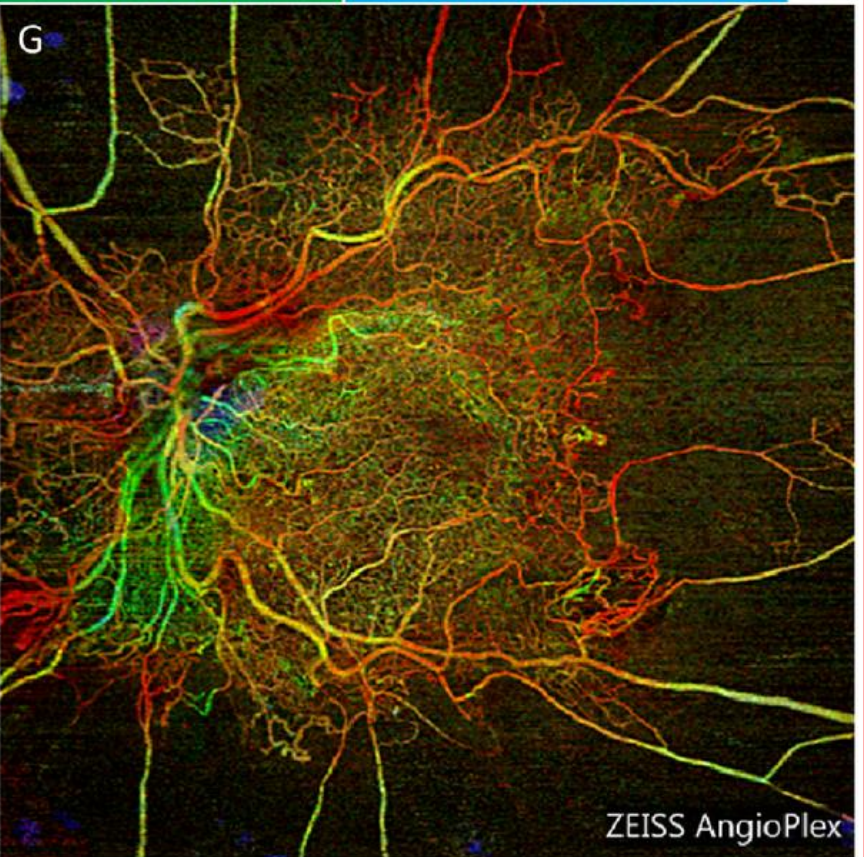
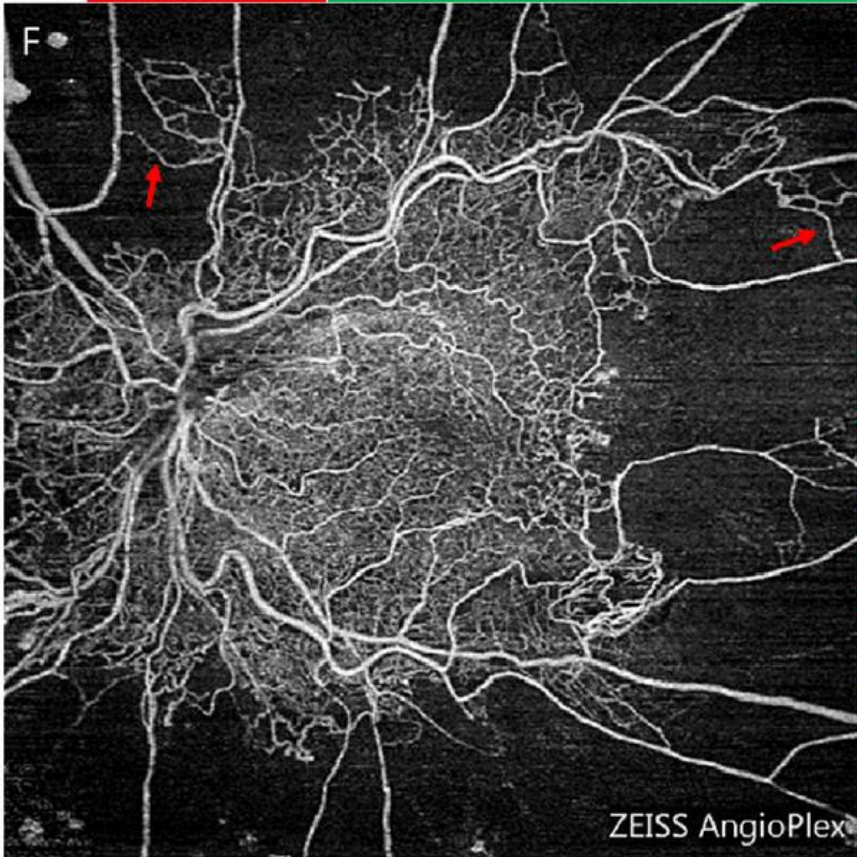
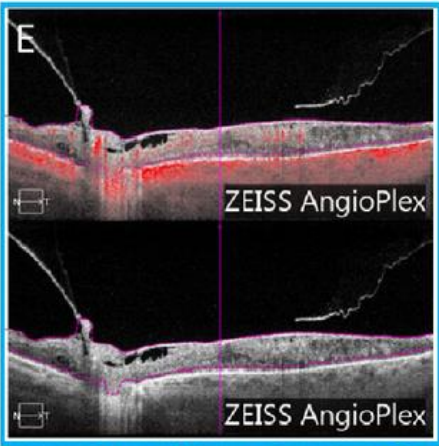
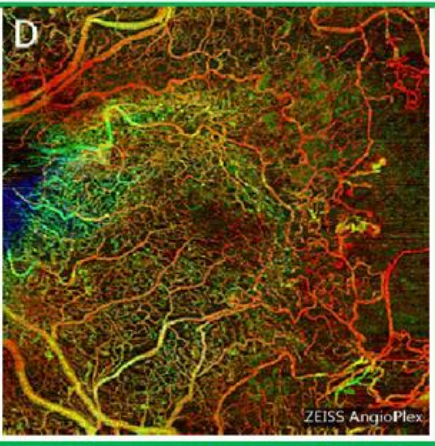
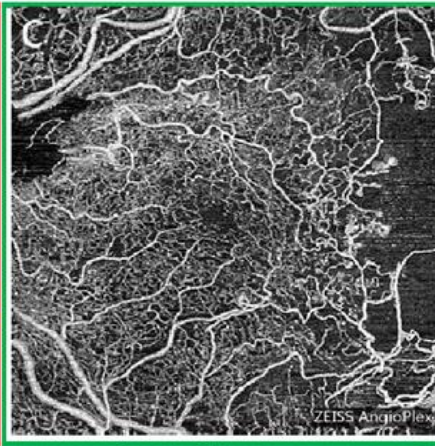
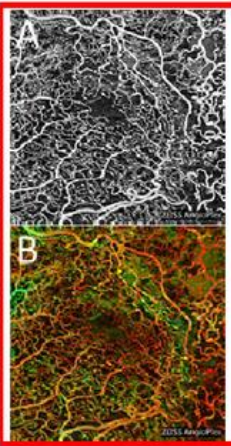


ZEISS AngioPlex

OMAG
 images
 of a 31
 year-old
 male with
**Proliferative
 Diabetic
 Retinopathy.**

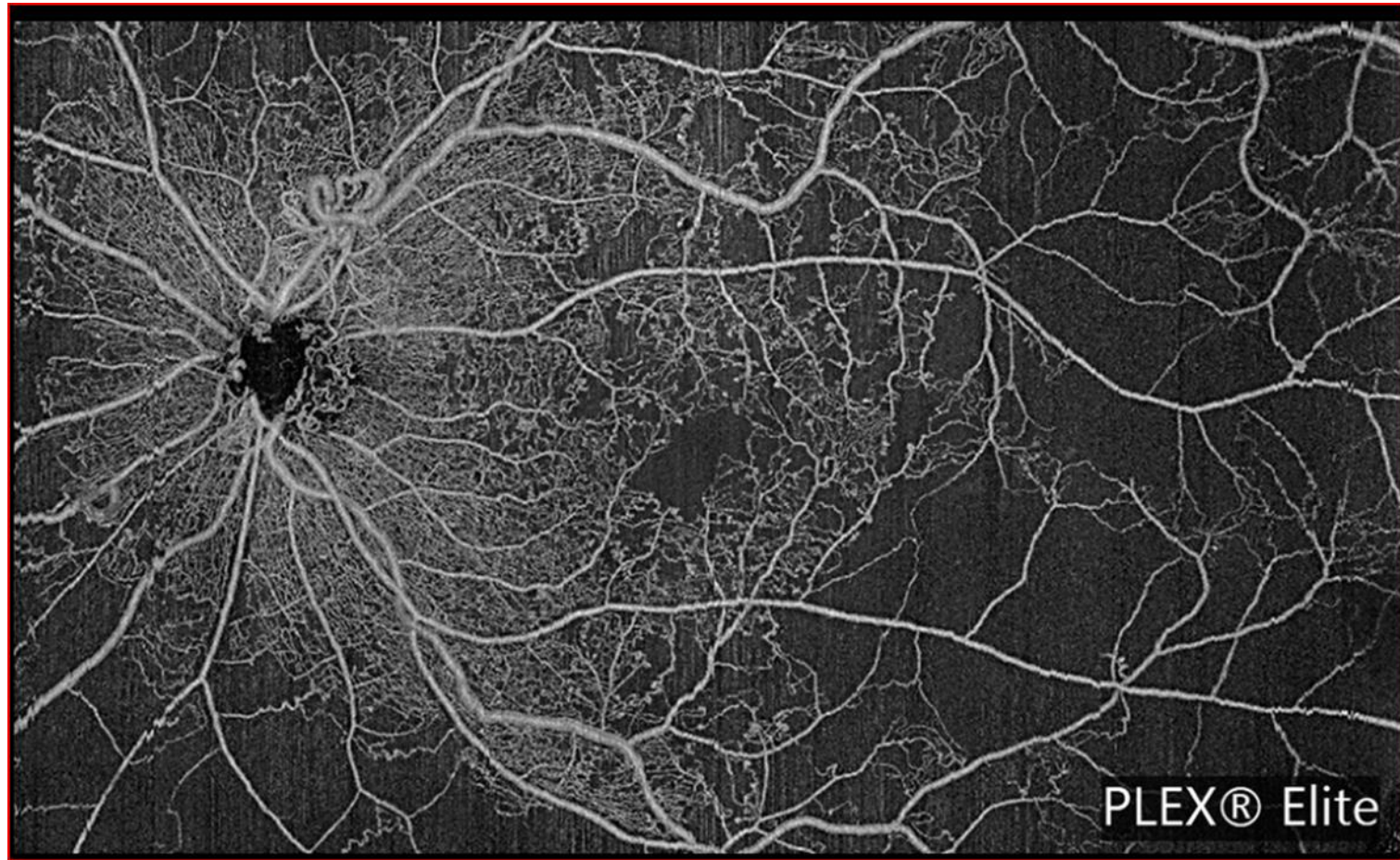


(A), fundus photo of proliferative diabetic retinopathy in the left eye. There are multiple, large fibrovascular complexes associated with pre-and intraretinal hemorrhages. (B), the late frame of the fluorescein angiography demonstrates diffuse leakage from several areas of active neovascularization. (C), the OMAG image of the whole retinal layer shows three large neovascular complexes that have penetrated into the vitreous cavity. (D), the structural optical coherence tomography shows the disruption of internal limiting membrane by the neovascular complexes (dashed lines indicated with #1,2,3 in (C)) and their growth into the vitreous cavity. (E), high-definition details of the vascular complex such as the vessel caliber, volume, density of capillary network can be appreciated compared to the FA. The flow OMAG image shows the evidence of vascular flow within the superotemporal neovascularization of elsewhere marked with a white dashed box in (C). by Qinqin Zhang et al. Scientific Reports Published: 25 February 2016





Ultra-WideField: Future Direction



ARI

ZEISS receives the **first US FDA Clearance for Swept-Source OCT** posterior ocular imaging with **PLEX Elite 9000**. It is a SS-OCT instrument with a **tunable laser centered at 1050 nm**, a scan speed of **100,000 A-scans/sec** at a tissue **depth of 3.0 mm**, and an **axial resolution of 6.3 μm** , with a **56° field of view**.

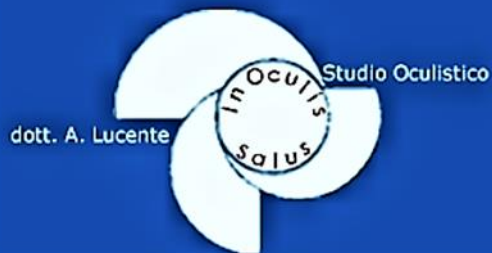
Advanced Retina Imaging (A R I) a global consortium (**network**) of the highest caliber of clinicians and scientists.



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Thank you for your kind attention!



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