

IGSN - COLLOQUIUM

Wednesday, July 14th • 13:30 • FNO – 01 / 117

ALF DUBRA

Department of Ophthalmology and Biomedical Engineering
University of Rochester Eye Institute, Rochester NY, USA

High resolution ophthalmic imaging using adaptive optics

We have built a couple of scanning laser ophthalmoscopes with adaptive optics (AOSLO) for imaging the retina in vivo with high resolution. These instruments, in a nutshell, are confocal microscopes in which the eye Ball acts as the microscope objective. The adaptive optics components of the instrument correct for the aberrations of the eye that prevent commercial clinical instruments from reaching the resolution limit imposed by diffraction. This means that we can achieve almost the same lateral and axial resolution that you could achieve with a confocal microscope with somewhat a fundamental limit, imposed by the focal length of the eye and the pupil diameter after using dilation drops. There are very few labs in the world that have AOSLOs, and until recently they have only been used in human subjects, non-human primates. We are currently building a system for mice. To date the main focus of research with these instruments have been the photoreceptor mosaic (in reflectance) and the ganglion cells (fluorescence). I have been trying to resolve the retinal ganglion cells (RGCs) because I would like to study glaucom. When trying to image the RGCs we have been able to resolve the varicosities along the RGCs axons in the nerve fiber layer and also what I am pretty convinced that are astrocytes. We also see some dark ellipsoidal structures of around 8um across that start around the outer plexiform layer and that that we cannot yet confirm whether they are Müller cells, astrocytes or vasculature.

Hosts:

Claudia Distler - Klaus-Peter Hoffmann

Faculty of Biology and Biotechnology, Ruhr-University Bochum

Guests are welcome !

