

Heidelberg Engineering

“Multimodal imaging is our guiding principle”

Non-invasive OCT angiography (OCTA) is currently one of the most frequently discussed topics at congresses and in educational events. What opportunities does it offer and what are its limitations? As Heidelberg Engineering recently launched its OCT Angiography Module* for the SPECTRALIS®, we spoke with Managing Director Dr. Kester Nahen about the features and benefits of the technology.

Dr. Nahen, about a year ago we spoke about OCTA, which was expected to be released soon at that time. In November 2016 your OCT Angiography Module was finally made available for purchase*. Do good things come to those who wait?

Dr. Nahen: Those familiar with Heidelberg Engineering products know that we attach great importance to the quality of our imaging solutions. Not only did we want to deliver extraordinary image quality, but we also wanted an OCT Angiography Module that could be integrated into the existing SPECTRALIS platform. This upgradeability aligns with our guiding principle of multimodal imaging and consequently with an efficient workflow. The OCT Angiography Module is available for SPECTRALIS devices with the OCT2 Module. The first OCTA customers have confirmed that they are very satisfied, particularly with the image quality, and with the ability to correlate pixel to pixel the OCTA images with images acquired with other modalities.

Which requirements or problems were there to resolve?

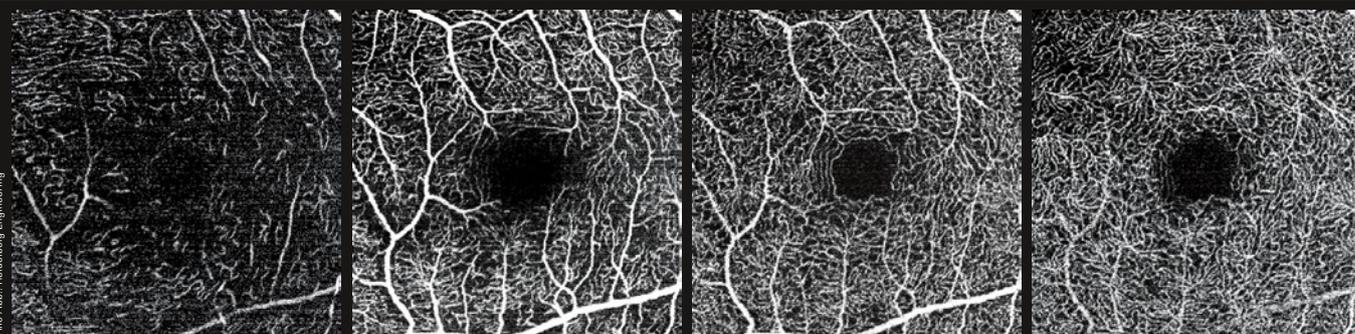
In order to achieve the high image resolution we had set as our goal, we developed an innovative mathematical model which

uses the data from the entire spectrum of an OCT signal of up to seven OCT B-scans. The analysis of the entire spectrum provides three-dimensional OCTA images with high axial resolution and enables a selective display of thin vascular networks. The images depict blood flow in the vasculature and visualize even small differences between consecutive OCT images.

OCTA is a frequently discussed topic at most ophthalmology congresses. After the initial excitement, some physicians have now become less enthusiastic and see the technological limitations or difficulties in the interpretation of the images. Can you understand their perspective? What would you say to them?

The challenges presented by a new imaging modality such as OCTA are clear to us. We believe that multimodal imaging is a great way of addressing these issues. The SPECTRALIS platform, for example, offers the ability to combine non-invasive OCTA with gold standard fluorescein angiography (FA) or indocyanine green scanning laser angiography (ICGA). With this so-called “hybrid” angiography approach,

* The OCT Angiography Module is available for purchase only outside the United States.



RNFL

GCL

IPL/INL

INL/OPL

The SPECTRALIS OCT Angiography Module provides high resolution OCTA images with a lateral resolution of 5.7 µm per pixel for the visualization of capillary vessels. The axial resolution of 3.9 µm per pixel enables detailed retinal layer segmentation. All four vascular networks can then be examined: Vasculature in the nerve fiber layer, in the ganglion cell layer, at the border of the inner plexiform layer to the inner nuclear layer, and at the border of the inner nuclear layer to the outer plexiform layer.



Photo: Heidelberg Engineering

Dr. Kester Nahen,
Managing Director,
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OCTA images can be utilized for follow-up examinations and compared pixel to pixel with an aligned SPECTRALIS FA or ICGA image.

It has been pointed out that much more experience is still needed, both in the interpretation of the data as well as in the detection of artifacts. How will clinicians receive the necessary training? Is there, for example, a database with case studies which the users can consult?

Most users, of course, are still just at the beginning of their learning curve. At the same time, many of them are particularly interested and motivated to learn more about this topic and improve their skills. Our Heidelberg Engineering Academy has started to offer a variety of OCTA courses as well as e-learning options. We will also continually make the latest materials, including new e-books and articles, available on our website.

"Can OCT angiography replace fluorescence angiography?" This question is now being asked less frequently. Rather, OCTA is more often seen as an additional examination to be combined with other imaging modalities. What are the possibilities in this context and how should OCTA be implemented?

Many experts have now come to agree that OCTA can provide new treatment-relevant information in various fields of application and can potentially replace fluorescence angiography in particular circumstances. In most cases, however, other imaging modalities remain indispensable and can only be supplemented by OCTA diagnostic information in terms of vascular changes. Time will tell how the clinical relevance of this promising but still new diagnostic information will be leveraged. The SPECTRALIS multimodal imaging platform enables a direct, pixel-to-pixel comparison of OCTA images to images acquired with other imaging modalities, including structural OCT, FA, and ICGA, as well as infrared reflectance, MultiColor, and BluePeak images.