



## Glowing picture of health

**Bill Harvey** has another look at the BluePeak software capability available on the Spectralis OCT

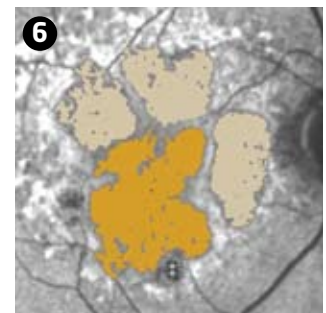
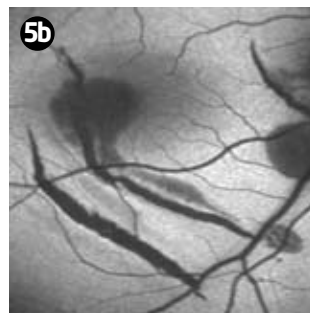
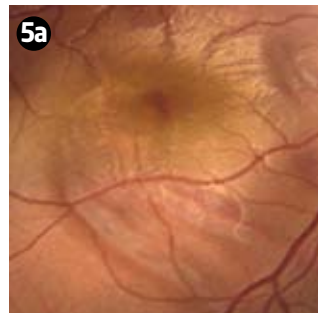
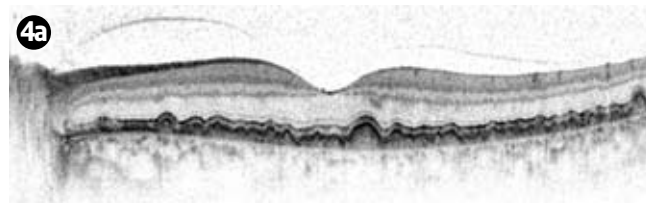
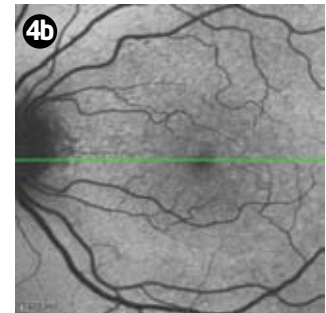
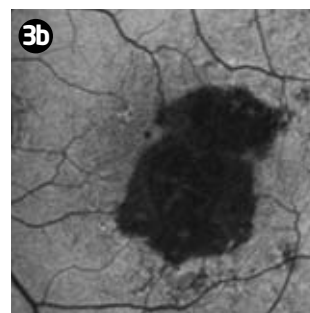
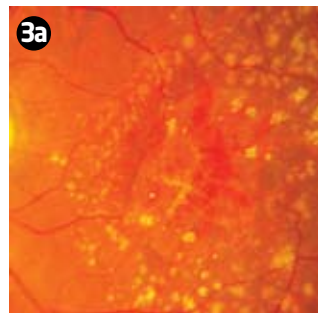
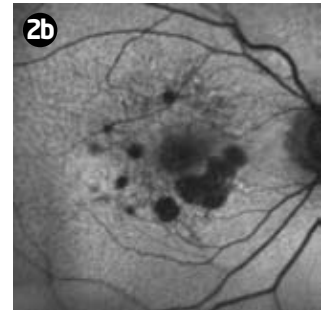
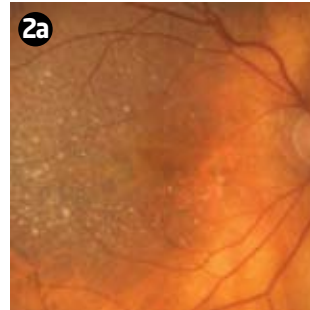
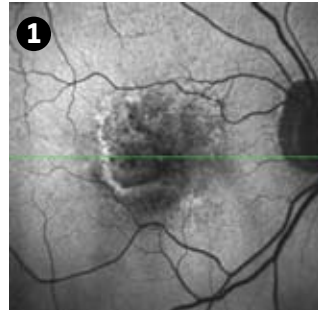
**T**he Spectralis OCT (Heidelberg UK) has been in use in hospital departments and optometry practices for some years now. Many units include BluePeak capability. This is an interesting development but one which, I feel, has yet to make an impact in optometry. The BluePeak system is a way of imaging lipofuscin and, as the images on this page reveal, is a novel and useful way of assessing retinal disease.

Lipofuscin is a normal by-product of photoreceptor metabolism. When photoreceptor discs are processed by lysosomes, a small amount of lipofuscin remains and accumulates in retinal pigment epithelium (RPE) cells. Lipofuscin accumulates with age and in the over-70-year-old eye it is estimated that 20-30 per cent of the cytoplasmic space is taken up by lipofuscin and melanolipofuscin (a combination with melanin). Extracellular accumulation of this debris constitutes drusen which, once large enough, lead to denaturation and depigmentation of overlying retinal pigment epithelium and so revealing the discrete yellow lesions familiar during ophthalmoscopy.

Lipofuscin is toxic and knowing the location of any over-accumulation within the RPE may be a useful health indicator.

### Disease

When exposed to blue light, lipofuscin fluoresces or glows. This appears white on BluePeak images. This occurs naturally and does not require any injection of dye (autofluorescence). Spectralis captures a map of lipofuscin distribution. Lighter areas indicate increased levels while darker areas are where there is no lipofuscin. Figure 1 shows a BluePeak image of an eye with geographical atrophy due to age-related macular degeneration. The black areas are devoid of lipofuscin, the grey surrounding areas normal, and the whiter areas immediately around and



streaking through the atrophy show increased accumulation. These are likely to become atrophic.

Figure 2a shows an area of drusen and early macular degeneration where the BluePeak image (Figure 2b) shows more extensive atrophy than might at first be suspected. Figures 3a and 3b show a long-standing geographical atrophy (note the crystalline drusen) and the BluePeak corresponds well with the area of retinal loss.

Figure 4a shows drusen as elevations under the RPE on a line scan with the OCT. These are seen on the BluePeak image (Figure 4b) as areas of lighter hue due to their autofluorescence. Figures 5a and 5b

show choroidal rupture with normal and BluePeak imaging.

### Quantification

The BluePeak software includes a 'RegionFinder' function which allows the viewer to click on any area so that it can then be highlighted as atrophic and quantified in terms of its area. This is particularly of interest when wishing to monitor the progress of a disease or the effectiveness of any therapy. Figure 6 shows how clicking on areas of atrophy fills them yellow and allows accurate area measurement. ●

● For more details contact Heidelberg UK on 01442 345370