

## **Selective absorption of short-wavelength light in the eye: Effects of pre-receptor filters and aging on chromatic sensitivity**

E. Konstantakopoulou and J. L. Barbur

Applied Vision Research Centre, The Henry Wellcome Laboratories for Vision Sciences, City University, London UK.

Inter-subject variations in yellow-blue (YB) chromatic sensitivity have often been attributed to differences in pre-receptor spectral absorption of light and the effects ageing has on these filters. The two main filters of blue light in the eye are Macular Pigment (MP) and the crystalline lens.

The absorption of blue light by the MP and the crystalline lens was measured and related to the subject's chromatic sensitivity at both 26 and 2.6 cd/m<sup>2</sup>. Red-green (RG) and YB chromatic detection thresholds were measured at the fovea for both young and older subjects using the Colour Assessment and Diagnosis (CAD) test.

A new Macula Assessment Profile (MAP) test was used to measure the spatial profile of the Macular Pigment Optical Density (MPOD) in each subject investigated (Kvansakul, Rodriguez-Carmona, et al., 2006: *Ophthalmic & Physiological Optics* 26:362-371). The MAP test employs a new implementation of the flicker-cancellation technique that also allows us to estimate the blue light absorption of the lens and the subjects' overall sensitivity to rapid flicker.

Preliminary results suggest that absorption of blue light by the MP does not significantly affect YB chromatic sensitivity. Increased absorption by the crystalline lens correlates well with age and also shows some correlation with decreased YB sensitivity. The worsening of YB chromatic sensitivity at the lower light level investigated and the increased inter-subject variability may well reflect changes in the retina due to ageing effects that also correlate with increased blue light absorption by the lens.