



## City Research Online

### City, University of London Institutional Repository

---

**Citation:** Dhanani, S., Asaria, T. S., Barbur, J. L. and Huntjens, B. (2012). Relationship between Macular Pigment and Foveal Anatomic Architecture in an Asian Population. Paper presented at the Association for Research in Vision and Ophthalmology, 06-05-2012 - 10-05-2012, Fort Lauderdale, USA.

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

---

**Permanent repository link:** <https://openaccess.city.ac.uk/id/eprint/5606/>

**Link to published version:**

**Copyright:** City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

**Reuse:** Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

---

---

---

City Research Online:

<http://openaccess.city.ac.uk/>

[publications@city.ac.uk](mailto:publications@city.ac.uk)

---

**Purpose:** : The extent to which reduced macular pigment optical density (MPOD) contributes to the prevalence of age related macular degeneration (ARMD) in Caucasians compared to other ethnicities has often been questioned. Foveal architecture may be related to MPOD levels and hence be a contributing factor. Previous studies have reported race-linked differences in peak MPOD and its central spatial distribution. This study investigates the relationship between MPOD and foveal architecture in an adult Asian population.

**Methods:** : The spatial profile of MPOD was assessed in 55 healthy Asian subjects (mean age  $21 \pm 4$  years) using heterochromatic flicker photometry (*Ophthalmic Physiol Opt.* 30:470-483,2010). High-resolution macular thickness maps were obtained using a spectral-domain optical coherence tomography (Spectralis OCT, Heidelberg, Germany). The following relationships were investigated: 1) Peak MPOD (at  $0^\circ$  eccentricity) and minimal foveal thickness (MFT) measured manually at the point of sharpest foveal reflex; 2) Peak MPOD and central foveal thickness (CFT: average retinal thickness within central 1mm circle of the ETDRS grid); 3) Peak MPOD and foveal width (FW: measured from crest to crest); 4) MFT and FW; 5) Average MPOD (ODav: over an area subtending  $\pm 2.8^\circ$  centred at the fovea) and FW; and 6) ODav and CFT.

**Results:** : The peak MPOD values (mean  $0.56 \pm 0.17$  log units) and the corresponding MFT showed good correlation ( $R^2 = 0.34$   $p < 0.0005$ ). A weaker correlation was found between peak MPOD and CFT ( $R^2 = 0.12$ ;  $p = 0.01$ ). A moderately significant negative correlation was found between FW and CFT ( $R^2 = 0.22$ ;  $p < 0.0005$ ) and between FW and MFT ( $R^2 = 0.1$ ;  $p = 0.03$ ). In contrast, no correlation was found between FW and peak MPOD at  $0^\circ$  ( $p = 0.84$ ), ODav and FW ( $p = 0.41$ ), or ODav and CFT ( $p = 0.59$ ).

**Conclusions:** : The current findings suggest that minimal foveal thickness (measured manually at the point of sharpest foveal reflex) is a better predictor value for MPOD compared to the central foveal thickness given by the OCT. The expectation that a wider foveal width may contain more macular pigment because of longer cone axon fibres is not supported by our findings in the Asian subject group. Our results suggest that differences in foveal architecture can explain some of the measured variations in MPOD.