

The Antagonistic Interaction of Cones in Human Eyes—a Pilot Study

Jenny Chun-Yee Lung

School of Optometry, The Hong Kong Polytechnic University
lungchunyee@netvigator.com

Henry Ho-Lung Chan

School of Optometry, The Hong Kong Polytechnic University

Abstract. Multifocal electroretinogram (mfERG) by Sutter (1992) provides a measuring tool of the retinal responses at different locations. Traditional mfERG stimulus at each base period is a pseudorandom m-sequence focal flash. By interleaving seven dark frames between the focal flashes, a slow-sequence stimulus can be formed to trigger retinal responses which are originated predominantly from the bipolar cells and inner retinal cells. In this study, the antagonistic interaction of cones in human eye was investigated by this slow-flash mfERG (sfmfERG) under different colour stimuli (white and blue colour conditions). The N1, P1 and photopic negative response (PhNR) of the sfmfERG were used to investigate the effect on the local retinal responses. It was found that the blue stimulus could trigger greater amplitudes of the N1, P1 and PhNR than the white stimulus did. In terms of the implicit time, the white stimulus would trigger P1 and PhNR with longer implicit time than the blue stimulus. White stimulus provides a broader spectrum signal than blue stimulus. The changes of cone responses from a broad to narrow spectrum stimulation may illustrate a decrease in the involvement of retinal antagonism and thus leads to an increase in amplitude and a decrease in implicit time.