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New concept and theory of myopia development

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We will present new concept using an effective axial length and ocular components ratios (L/R1, L/R1) to define the refractive states. Wavefront technology for customized laser *in situ* keratomileusis (LASIK) is gaining popularity. The standard LASIK procedure that requires only preoperative measurements of the cornea, particularly its front surface curvature and patient refractive error is not sufficient for customized procedures. The whole eye system consists of at least seven optical components: The front and back surface; radius of curvature of the cornea (rl, r2) and of the lens (Rl, R2); cornea and lens thickness (tl, t); anterior chamber depth (S) and globe axial length (L). Most published works about measuring optical components, however, are limited to the analysis of mean values. Measurements by Hosny and colleagues were also limited to the refractive states of L/rl and L/S, but no data were shown for lens curvature or thickness. Given the ratio of r2/rl (about 0.85) and R2/R1 (about 0.7), we able to reduce the seven ocular components to only two refractive states, Cl and C2, given by C1+0.51C2=4.33 - mD/1336, with m=0.003L. For a wide range of values of r2/rl=0.8-0.9, R2/R1=0.6-0.8, rl=6.5-8.5 mm, Rl=9.5-13 mm and L=23 mm, we calculated Cl=2.9-3.4, C2=1.8-2.4, ml=0.067-0.071 and m2=0.134-0.138. Using the referenced parameter set of (f1, f2, So, T, L*)=(31, 60, 3.3, 4.0, 24 mm), an ocular system deviating from this referenced-set, its emmetropic state is governed by an effective axial length L*=22.5+0.36(43.1-D1)+0.3(22.3-D2)+0.5(So-3.3)+0.35(T-4.0), where D1 and D2 are the corneal and lens power. Therefore, myopia is developed as a result of mismatching of above parameters, such that L*>L0 (22.5 mm).

Biography

Jui-Teng Lin has completed his PhD in Physics from University of Rochester, USA in 1981. He is currently the Chairman and CEO of New Vision Inc., Taiwan and Visiting Professor at HE Medical University, China. He has served as a Visiting Professor at National Chao-Tung University and an Associate Professor at the University of Central Florida. He holds over 45 patents and is the Inventor (US patents, 1992, 2000) of flying spot LASIK procedure. He has published over 55 book chapters and over 150 peer review journal papers including 75 SCI-impacted papers.

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