



AB008: Structural and molecular changes in cornea and sclera of highly myopic-astigmatic chicks

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Abstract: Myopia and astigmatism, two common refractive errors frequently co-exist, are degrading vision at all working distances in populations worldwide. Eyeballs having high degrees of myopia and astigmatism are known to exhibit abnormal eye shape at the anterior and posterior eye segments, but whether the outer coats of these abnormal eyeballs, cornea anteriorly and sclera posteriorly, are regulated by region-specific molecular mechanism remains unclear. Here we presented the changes in eye shape and mRNA expression levels of three genes (MMP2, TIMP2, and TGFB2), all known to participate in extracellular matrix organization, at five regions of the cornea and sclera in chickens developing high myopia and astigmatism induced by form deprivation. Our results showed that, compared to normal chicks, the highly myopic-astigmatic chicks had significantly astigmatic cornea, deeper anterior chamber, longer axial length, and higher expressions of all three genes in the superior sclera. These results imply that local molecular mechanism may manipulate the eye's structural remodeling across the globe during refractive eye growth.

Keywords: Myopia; astigmatism; mRNA; cornea; sclera

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