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Retinoic acid signals the direction of ocular elongation in the guinea pig eye

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Abstract

A growing eye becomes myopic after form deprivation (FD) or compensates for the power and sign of imposed spectacle lenses. A possible mediator of the underlying growth changes is all-*trans* retinoic acid (RA). Eye elongation and refractive error (RE) was manipulated by raising guinea pigs with FD, or a spectacle lens worn on one eye. We found retinal-RA increased in myopic eyes with accelerated elongation and was lower in eyes with inhibited elongation. RA levels in the choroid/sclera combined mirrored these directional changes. Feeding RA (25 mg/kg) repeatedly to guinea pigs, also resulted in rapid eye elongation (up to 5 times normal), and yet the RE was not effected. In conclusion, RA may act as a signal for the direction of ocular growth.



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Keywords

Retinoid; Myopia; Emmetropization; Growth; Rodent

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