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Chx10 functions as a regulator of molecular pathways controlling the regional identity in the primordial retina.

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Abstract:

The light-sensitive neural retina (NR) and the retinal pigmented epithelium (RPE) develop from a common primordium, the optic vesicle, raising the question of how they acquire and maintain distinct identities. Here, we demonstrate that sustained misexpression of the *Chx10* homeobox gene in the presumptive RPE in chick suppresses accumulation of melanin pigments and promotes ectopic NR-like neural differentiation. This phenotypic change involved ectopic expression of NR transcription factor genes, *Sox2*, *Six3*, *Rx1* and *Optx2*, which, when misexpressed, counteracted RPE development without upregulating *Chx10*. These results suggest that *Chx10* can function as a cell autonomous regulator of the regional identity in the primordial retina, presumably through a downstream transcriptional cascade.

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