Age-dependent reduction in the expression of cellular inhibitor of apoptosis 1 (cIAP1) in the retina: implications for age-related retinal degeneration and glaucoma

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Retinal ganglion cell (RGC) death by apoptosis is the principal pathological event in glaucoma that underlies vision loss. In this study, the role of apoptotic pathways in RGC development and pathological death are examined, concentrating first on the profile of apoptotic inhibition preparatory to studying the activation of these pathways in a rodent model of experimental glaucoma.

Caspase expression remained constant while expression of inhibitors of apoptosis (IAP) generally was decreased during ageing of the rat retina. In particular, cIAP1 expression, both at mRNA and protein level was significantly downregulated in mature retinas. Tumor necrosis factor receptor- associated factor 2 (TRAF2), a protein essential for cIAP1 signalling, was elevated in the mature retina. RGC dendrite complexity was significantly reduced in mature RGCs. Our data suggest that reduced cIAP1 expression may be linked to remodelling of the RGC dendritic field and ultimately to cell death by reducing activation of survival pathways. Taken together, these results highlight pathways that could be targeted to arrest RGC degeneration in ageing and glaucoma.