

# Interleukin-6 Deficiency Attenuates Retinal Ganglion Cell Axonopathy and Glaucoma-Related Vision Loss

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The pleiotropic cytokine interleukin-6 (IL-6) is implicated in retinal ganglion cell (RGC) survival and degeneration, including that associated with glaucoma. IL-6 protects RGCs from pressure-induced apoptosis *in vitro*. However, it is unknown how IL-6 impacts glaucomatous degeneration *in vivo*. To study how IL-6 influences glaucomatous RGC axonopathy, accompanying glial reactivity, and resultant deficits in visual function, we performed neural tracing, histological, and neurobehavioral assessments in wildtype (B6;129SF2/J; WT) and IL-6 knock-out mice (B6;129S2-IL6<sup>tm1kopf/J</sup>; IL-6<sup>-/-</sup>) after 8 weeks of unilateral or bilateral microbead-induced glaucoma (microbead occlusion model).

IOP increased by 20% following microbead injection in both genotypes ( $p < 0.05$ ) and degenerating axon profiles were minimal. Preservation of RGC axons was reflected in visual function, where visual acuity decreased significantly in a time-dependent manner with microbead-induced IOP elevation in WT ( $p < 0.05$ ). Despite this preservation of RGC axons and visual acuity, both microbead-injected WT and IL-6<sup>-/-</sup> mice exhibited a 50% decrease in anterograde CTB transport to the superior colliculus, as compared to saline-injected controls ( $p <$ <http://www.ncbi.nlm.nih.gov/pubmed/28620279>).