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Effects of abnormal optineurin expression on the survival of the rat retinal ganglion cell line RGC-5

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ABSTRACT. The *OPTN* gene is thought to be associated with certain types of glaucoma and the function of the protein for which it encodes, optineurin, has been extensively researched, but with contradictory results. We explored the effects of abnormal optineurin expression on the survival of the rat retinal ganglion cell line RGC-5. Plasmids expressing wild-type (WT) or E50K mutant optineurin, or *OPTN*-specific double-hairpin small interfering RNA (si-RNA), were transfected into RGC-5 cells. The effects on cell survival were monitored by observation of cell morphology and propidium iodide and Hoechst 33342 fluorescent staining, while expression of optineurin was visualized by fluorescence microscopy. Abnormal optineurin expression influenced the survival of RGCs *in vitro*, as apoptosis was induced by increased WT and E50K mutant optineurin, while a reduction in apoptosis was observed in cells transfected with *OPTN*-siRNA. Similar results were also observed in transfected cells treated with apoptotic stimuli. Overexpression

of WT and mutant E50K protein resulted in greater cell death, while downregulation decreased RGC-5 apoptosis.

Key words: *OPTN*; RGC-5; Cell survival; Apoptotic stimulus

