

Emerging novel roles of neuropeptide Y in the retina: From neuromodulation to neuroprotection

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Neuropeptide Y (NPY) and NPY receptors are widely expressed in the central nervous system, including the retina. Retinal cells, in particular neurons, astrocytes, and Müller, microglial and endothelial cells express this peptide and its receptors (Y1, Y2, Y4 and/or Y5) . Several studies have shown that NPY is expressed in the retina of various mammalian and non-mammalian species. However, studies analyzing the distribution of NPY receptors in the retina are still scarce.

Although the physiological roles of NPY in the retina have not been completely elucidated, its early expression strongly suggests that NPY may be involved in the development of retinal circuitry. NPY inhibits the increase in $[Ca^{2+}]_i$ triggered by elevated KCl in retinal neurons, protects retinal neural cells against toxic insults and induces the proliferation of retinal progenitor cells.

In this review, we will focus on the roles of NPY in the retina, specifically proliferation, neuromodulation and neuroprotection. Alterations in the NPY system in the retina might contribute to the pathogenesis of retinal degenerative diseases, such as diabetic retinopathy and glaucoma, and NPY and its receptors might be viewed as potentially novel therapeutic targets.

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