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Poster Sessions

Systemic administration of an apelin receptor agonist protects against NMDA-induced retinal ganglion cell death

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Glutamate excitotoxicity via NMDA receptors is associated with retinal ganglion cell (RGC) death in retinal diseases, such as glaucoma and diabetic retinopathy. We have previously reported that the apelin receptor is expressed in the RGCs and intravitreal injection of apelin inhibits RGC death induced by NMDA in mice. In the present study, we investigated whether systemic administration of an apelin receptor agonist protects the RGCs from NMDA-induced excitotoxicity. The apelin agonist ML233 (5 mg/kg) was administered intraperitoneally at 1 h before intravitreal injection of NMDA (10 nmol) in mice. The effect of ML233 on RGC death was assessed by immunohistochemistry with anti-Brn-3a and anti-calretinin antibodies. ML233 significantly prevented the decrease of the number of Brn-3a and calretinin-positive RGCs at 24 h after NMDA injection. Moreover, ML233 markedly suppressed NMDA-induced cell death of calretinin-positive amacrine cells, which are exquisitely sensitive to glutamate excitotoxicity in the retina. Our results suggest that systemic administration of apelin receptor agonists prevents retinal neuronal death induced by excitotoxicity via NMDA receptors.