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Oral Sessions

Roles of low density lipoprotein receptor-related protein 1 ligands in glaucomatous optic neuropathy

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Apolipoprotein E-containing lipoproteins (E-LPs) have crucial roles of lipid transport in the central nervous system. α 2-Macroglobulin (a2M) is a pan-protease inhibitor found in plasma and cerebrospinal fluid. Both of these proteins act as ligands of low density lipoprotein receptor-related protein 1 (LRP1). We previously reported that E-LPs protected neurons via the LRP1 from degeneration induced by glutamate excitotoxicity in vitro and in vivo. It has been reported that a2M is increased in aqueous humor of glaucoma patients. Here, we demonstrated that intravitreal injection of E-LPs protected retina from degeneration caused by intravitreal injection of *N*-methyl-D-aspartate in rats, a model of glaucoma. Intravitreal administration of E-LPs also attenuated the elevated a2M level in aqueous humor of the glaucoma model. Moreover, an addition of E-LPs into medium of primary cultured retinal glia decreased a2M level through LRP1. The protective effect of E-LPs against excitotoxicity in primary cultured retinal ganglion cells was interfered by a2M, but additional treatment of E-LPs overcame the interference. These results may indicate a potential therapeutic role of an LRP1 ligand in the retina as treatments for glaucoma.