Molecular Mechanism of Neuroprotection in Glaucoma Using Gouqizi (Wolfberry)

Abstract:
The active component of Wolfberry (Lycium barbarum), lycium barbarum polysaccharides (LBP), has been shown to be neuroprotective to retinal ganglion cells (RGCs) against ocular hypertension (OH). Aiming to study whether this neuroprotection is mediated via modulating immune cells in the retina, we used multiphoton confocal microscopy to investigate morphological changes of microglia.

In whole-mounted retinas, Retinas under OH displayed slightly activated microglia. One to 100 mg/kg LBP exerted the best neuroprotection and elicited moderately activated microglia in the inner retina with ramified appearance but thicker and focally enlarged processes. Intravitreous injection of lipopolysaccharide decreased the survival of RGCs at 4 weeks, and the activated microglia exhibited amoeboid appearance as fully activated phenotype. When activation of microglia was attenuated by intravitreous injection of macrophage/microglia inhibitory factor, protective effect of 10 mg/kg LBP was attenuated. The results implicated that neuroprotective effects of LBP were partly due to modulating the activation of microglia.