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## Sesamin

Sesamin, a major lignan of sesame oil, was reported to have neuroprotective effects in several brain injury models. However, its protective action in maintaining blood-brain barrier (BBB) integrity has not been studied. In this study we investigated the effects of sesamin on the BBB in a mouse model of traumatic brain injury (TBI) and explored the underlying mechanisms. Adult male C57BL/6 mice were subjected to a controlled cortical impact (CCI) injury and then received sesamin (30 mg·kg-1·d-1, ip). The mice were euthanized on the 1st and 3rd days after CCI injury and samples were collected for analysis. Sesamin treatment significantly attenuated CCI-induced brain edema on the 1st and 3rd days after the injury, evidenced by the decreases in water content, tissue hemoglobin levels, Evans blue extravasation and AQP4 expression levels in the ipsilateral cortical tissue compared with the vehicle-treated group. Furthermore, sesamin treatment significantly alleviated CCI-induced loss of the tight junction proteins ZO-1 and occludin in the brain tissues. The neuroprotective mechanisms of sesamin were further explored in cultured mouse brain microvascular bEnd.3 cells subjected to biaxial stretch injury (SI). Pretreatment with sesamin (50 µmol/L) significantly alleviated SI-induced loss of ZO-1 in bEnd.3 cells. Furthermore, we revealed that pretreatment with sesamin significantly attenuated SI-induced oxidative stress and early-stage apoptosis in bEnd.3 cells by decreasing the activation of ERK, p-38 and caspase-3. In conclusion, sesamin alleviates BBB disruption at least partly through its anti-oxidative and anti-apoptotic effects on endothelial cells in CCI injury. These findings suggest that sesamin may be a promising potential therapeutic intervention for preventing disruption of the BBB after TBI <sup>1)</sup>.

Liu YL, Xu ZM, Yang GY, Yang DX, Ding J, Chen H, Yuan F, Tian HL. Sesamin alleviates blood-brain barrier disruption in mice with experimental traumatic brain injury. Acta Pharmacol Sin. 2017 Nov;38(11):1445-1455. doi: 10.1038/aps.2017.103. Epub 2017 Aug 3. PMID: 28770828; PMCID:

## 1)

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