Repulsive guidance molecule A

Repulsive guidance molecule A (RGMa) is implicated in focal cerebral ischemia reperfusion injury, but its mechanisms are still largely unknown.

A work of Li et al., focused on the effects of RGMa on the blood brain barrier (BBB) after focal cerebral ischemia reperfusion injury

Sprague-Dawley (SD) rats were randomly divided into four groups: sham, middle cerebral artery occlusion (MCAO)/reperfusion (I/R), MCAO/reperfusion administered recombinant adenovirus expressing sh-con (I/R + sh-con) and MCAO/reperfusion administered recombinant adenovirus expressing sh-RGMa (I/R + sh-RGMa) groups. Infarct volume, brain edema and neurological scores were evaluated at 3 day after reperfusion. Evens blue leakage and transmission electron microscopy was performed. And the expression level of claudin-5 and ZO-1, CDC-42 and PAK-1, RGMa were detected by western blot.

Compared with I/R or I/R + sh-con groups, I/R + sh-RGMa group showed smaller infarction volume, attenuated brain edema, improved neurological scores and better BBB integrity, such as reduced Evans blue leakage and ultra-structural change. We also observed improved BBB function followed by down-regulation of MMP-9 and up-regulation of claudin-5 and ZO-1 in the I/R + sh-RGMa group. In addition, up-regulation of the CDC-42 and PAK-1 in the I/R + sh-RGMa group was obtained.

RGMa may be involved in I/R injury associated with BBB dysfunction via the CDC-42/PAK-1 signal pathway and may be a promising therapeutic target for I/R injury [1].

[1]

Li M, Wen Y, Zhang R, Xie F, Zhang G, Qin X. Adenoviral Vector-Induced Silencing of RGMa Attenuates Blood-Brain Barrier Dysfunction in a Rat Model of MCAO/Reperfusion. Brain Res Bull. 2018 Jun 20. pii: S0361-9230(18)30002-9. doi: 10.1016/j.brainresbull.2018.06.010. [Epub ahead of print] PubMed PMID: 29935233.