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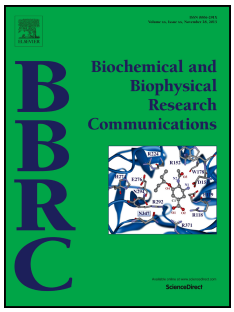

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miR-32-5p-mediated Dusp5 downregulation contributes to neuropathic pain

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Abstract

Previous studies have demonstrated that microRNAs (miRNAs) play important roles in the pathogenesis of neuropathic pain. In the present study, we found that miR-32-5p was significantly upregulated in rats after spinal nerve ligation (SNL), specifically in the spinal microglia of rats with SNL. Functional assays showed that knockdown of miR-32-5p greatly suppressed mechanical allodynia and heat hyperalgesia, and decreased inflammatory cytokine (IL-1β，TNF-α and IL-6) protein expression in rats after SNL. Similarly, miR-32-5p knockdown alleviated cytokine production in lipopolysaccharide (LPS)-treated spinal microglial cells, whereas its overexpression had the opposite effect. Mechanistic investigations revealed Dual-specificity phosphatase 5 (Dusp5) as a direct target of miR-32-5p, which is involved in the miR-32-5p-mediated effects on neuropathic pain and neuroinflammation. We demonstrated for the first time that miR-32-5p promotes neuroinflammation and neuropathic pain development through regulation of Dusp5. Our findings highlight a novel contribution of miR-32-5p to the process of neuropathic pain, and suggest possibilities for the development of novel therapeutic options for neuropathic pain.

Keywords: Neuropathic Pain; miR-32-5p; Dusp5; Microglia; Spinal nerve ligation