

Do glial cells control pain?

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摘要

Abstract

Management of chronic pain is a real challenge, and current treatments focusing on blocking neurotransmission in the pain pathway have only resulted in limited success. Activation of glia cells has been widely implicated in neuroinflammation in the central nervous system, leading to neurodegeneration in many disease conditions such as Alzheimer's and multiple sclerosis. The inflammatory mediators released by activated glial cells, such as tumor necrosis factor-alpha and interleukin-1beta can not only cause neurodegeneration in these disease conditions, but also cause abnormal pain by acting on spinal cord dorsal horn neurons in injury conditions. Pain can also be potentiated by growth factors such as BDNF and bFGF that are produced by glia to protect neurons. Thus, glia cells can powerfully control pain when they are activated to produce various pain mediators. We will review accumulating evidence supporting an important role of microglia cells in the spinal cord for pain control under injury conditions (e.g. nerve injury). We will also discuss possible signaling mechanisms in particular MAP kinase pathways that are critical for glia control of pain. Investigating signaling mechanisms in microglia may lead to more effective management of devastating chronic pain.