MS02-3 Glial cells: potential targets for developing new analgesics

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Neuropathic pain is a highly debilitating pain condition that occurs after nerve damage and is generally resistant to currently available treatments. Such pain involves aberrant excitability in dorsal horn neurons following nerve injury. Recent emerging lines of evidence indicate that the enhanced activity of dorsal horn neurons requires a communication with spinal microglia. Results of our laboratory have shown that following nerve injury, stimulating interferon-γ receptors (IFN-γR) leads to activation of microglia in the spinal cord. Activated microglia induce or enhance expression of various genes including neurotransmitter receptors and intracellular signaling molecules. By responding to extracellular stimuli, the activated microglia evoke various cellular responses such as production and release of bioactive factors including cytokines and neurotrophic factors. These factors then cause hyperexcitability of dorsal horn pain pathway. On the other hand, spinal astrocytes are also activated by nerve damage and are implicated in neuropathic pain, especially in the process in pain maintenance. These results suggest that signaling from glial cells to neurons plays a fundamental role in the pathogenesis of neuropathic pain and that glial cells are new therapeutic targets.