

Unconventional sensory messengers in the spinal cord: clues from histological and functional analysis

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SUMMARY

Although synapses are traditionally considered as *the* sites of exchange of information between neurons, the existence of non-synaptic transmission is now generally accepted. Nonsynaptic transmitters are “unconventional” transmitters under several ways, but, broadly speaking, they all are released independently of and/or diffuse out of the synaptic cleft to act on distant receptors. We review here the more recent literature and describe some findings obtained in our laboratory on the localization and biological effects of substance P, brain-derived neurotrophic factor, and nitric oxide, which may be considered the most important “unconventional” transmitters in spinal cord sensory pathways. The general picture which emerges after combined histological and functional analysis is that all these messengers affect glutamatergic neurotransmission in the dorsal horn, and interact among each other contributing, under certain conditions, to the establishment of central sensitization, a type of synaptic plasticity that is at the basis of several forms of altered pain perception.