Neurotensin

Neurotensin is a 13 amino acid neuropeptide that is implicated in the regulation of luteinizing hormone and prolactin release and has significant interaction with the dopaminergic system. Neurotensin was first isolated from extracts of the bovine hypothalamus based on its ability to cause visible vasodilation in the exposed cutaneous regions of anesthetized rats.

Neurotensin is distributed throughout the central nervous system, with the highest levels in the hypothalamus, amygdala, and nucleus accumbens. It induces a variety of effects, including analgesia, hypothermia, and increased locomotor activity. It is also involved in the regulation of dopamine pathways. In the periphery, neurotensin is found in enteroendocrine cells of the small intestine, where it leads to secretion and smooth muscle contraction.

Neurotensin (NTS) and its high-affinity receptor (NTSR1) overexpression induces neoplastic growth and predicts the poor prognosis in various malignancies. Whether NTS can promote glioma progression and its prognostic significance for glioma patients remains unclear.

NTS precursor (ProNTS), NTS, and NTSR1 expression levels in glioma were detected by immunoblotting Elisa and immunohistochemistry assay. The prognostic analysis was conducted from the internet by the R2 microarray platform. Glioma cell proliferation was evaluated by CCK8 and BrdU incorporation assay. The wound healing model and Matrigel transwell assay were utilized to test cellular migration and invasion. The orthotopic glioma implantations were established to analyze the role of NTS and NTSR1 in glioma progression in vivo.

Results: Positive correlations were shown between the expression levels of NTS and NTSR1 with the pathological grade of gliomas. The high expression levels of NTS and NTSR1 indicate a worse prognosis in glioma patients. The proliferation and invasiveness of glioma cells could be enhanced by NTS stimulation and impaired by the inhibition of NTSR1. NTS stimulated Erk1/2 phosphorylation in glioma cells, which could be reversed by SR48692 or NTSR1-siRNA. In vivo experiments showed that SR48692 significantly prolonged the survival length of glioma-bearing mice and inhibited glioma cell invasiveness.

NTS promotes the invasion and glioma proliferation via the activation of NTSR1. High expression levels of NTS and NTSR1 predict a poor prognosis in glioma patients [1) 2)].

A study demonstrates that acromegalic patients have increased serum pro-neurotensin (PNT) levels. Moreover, serum PNT plays a potential role in the abnormal lipid metabolism of acromegalic patients [3)].

1)
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2)
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3)

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