

Product Data Sheet

Product Name: Neurotensin
Cat. No.: GC16357

Chemical Properties

Cas. No. 39379-15-2

Chemical Name (Z)-5-(((Z)-1-((6-amino-1-(2-((Z)-((Z)-1-((1-(2-((Z)-((Z)-1-((Z)-1-((1-carboxy-3-methylbutyl)imino)-1-hydroxy-3-methylpentan-2-yl)ir

SMILES CCC(C/N=C(O)/C/N=C(O)/C1CCCN1C(C/N=C(O)/C/N=C(O)/C2CCCN2C(C/N=C(O)/C/N=C(O)/C/N=C(O)/C/N=C(O)/C/N=C(O)/C3

Formula C₇₈H₁₂₁N₂₁O₂₀

Solubility Soluble to 0.70 mg/ml in sterile water

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure

Protocol

Cell experiment [1]:

Cell lines Calu-3, NCI-H358, and NCI-H441 cells (non-small cell lung cancer cell lines)

Preparation Method Cells were cultured in RPMI-1640 medium containing 10% fetal bovine serum (FBS). When confluent, cells were washed with SIT medium (RPMI-1640 containing sodium selenite, bovine insulin and apo-transferrin) for 2 hours. Cells were treated with inhibitors (e.g., SR48692, mAb3481, PP2, GM6001, PD98059, LY294002, N-acetylcysteine or Tiron) for 30min. Then Neurotensin (0.1μM) or Neuregulin 1 (NRG1) was added.

Reaction Conditions 0.1μM; 5min

Applications Neurotensin significantly increased tyrosine phosphorylation of HER3 in NSCLC cells. NTS addition to NCI-H441 cells resulted in the formation of EGFR/HER3 and HER2/HER3 heterodimers. Adding Neurotensin to NSCLC cells increased phosphorylation of ERK, HER3, and AKT. Neurotensin increased colony formation of NSCLC cells. The ability of Neurotensin to increase HER3 tyrosine phosphorylation was impaired by SR48692 (NTSR1 antagonist), monoclonal antibody 3481 (HER3 blocker), GM6001 (MMP inhibitor), PP2 (Src inhibitor), Tiron (superoxide scavenger), or N-acetylcysteine (antioxidant).

Animal experiment [2]:

Animal models Male CD-1 mice (weighing 25 to 30g)

Preparation Method Mice were administered Neurotensin (1pg to 25ng) intracerebroventricularly (i.c.v.) in a volume of 4μl under light halothane anesthesia, generally 10min before the tail flick test (TFT). Morphine was administered intrathecally (i.t.) 5min before the TFT.

Dosage form 1pg to 25ng; i.c.v.; single injection

Caution: Product has not been fully validated for medical applications. For research use only.

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Applications Neurotensin significantly antagonized the antinociceptive (analgesic) action of morphine administered intrathecally. This antianalgesic action of Neurotensin was mediated by spinal cholecystokinin (CCK).

References:

- [1] Moody TW, Ramos-Alvarez I, Jensen RT. Adding of neurotensin to non-small cell lung cancer cells increases tyrosine phosphorylation of HER3. *Peptides*. 2022 Oct;156:170858..
- [2] Holmes BB, Rady JJ, Smith DJ, et al. Supraspinal neurotensin-induced antianalgesia in mice is mediated by spinal cholecystokinin. *Jpn J Pharmacol*. 1999 Feb;79(2):141-9.

Background

Neurotensin is a neuropeptide composed of 13 amino acids, which functions as a neurotransmitter, hormone, and neuromodulator. Neurotensin lowers blood pressure, inhibits gastrointestinal motility and gastric acid secretion to regulate digestive function, while also modulating ceramide synthesis via the NTS-NTSR2 signaling pathway to reduce inflammation and regulate metabolism. Neurotensin can be used in research related to neuropsychiatric disorders (such as schizophrenia and Parkinson's disease) and metabolic diseases (such as obesity and metabolic-associated fatty liver disease)^[1-4].

In vitro, Neurotensin (1 μ M) treated MKN-1 and MKN-45 gastric cancer cells for 5 minutes. Neurotensin activated the expression and activity of matrix metalloproteinase-9 (MMP-9) through the NTR1 receptor, promoting cell invasion and migration^[5]. Neurotensin (0.1 μ M) treated Calu-3, NCI-H358, and NCI-H441 non-small cell lung cancer cells for 5 minutes. Neurotensin significantly increased HER3 tyrosine phosphorylation and promoted the formation of EGFR/HER3 and HER2/HER3 heterodimers^[6].

In vivo, Neurotensin (1pg-25ng; single injection) was administered intracerebroventricularly to CD-1 mice. Neurotensin significantly antagonized the analgesic effect induced by morphine^[7]. Neurotensin (10 μ g; single injection) was administered intrathecally to C57BL/6 mice. Neurotensin significantly alleviated thermal pain and formaldehyde-induced pain^[8].

References:

- [1] Staley J, Fiskum G, Davis TP, et al. Neurotensin elevates cytosolic calcium in small cell lung cancer cells. *Peptides*. 1989 Nov-Dec;10(6):1217-21.
- [2] Ehlers RA, Zhang Y, Hellmich MR, et al. Neurotensin-mediated activation of MAPK pathways and AP-1 binding in the human pancreatic cancer cell line, MIA PaCa-2. *Biochem Biophys Res Commun*. 2000 Mar 24;269(3):704-8.
- [3] Okamoto A, Nakanishi T, Tonai S, et al. Neurotensin induces sustainable activation of the ErbB-ERK1/2 pathway, which is required for developmental competence of oocytes in mice. *Reprod Med Biol*. 2024 Mar 20;23(1):e12571.
- [4] Banerjee M, Song J, Yan B, et al. Neurotensin promotes hepatic steatosis by regulating lipid uptake and mitochondrial adaptation in hepatocytes. *Cell Death Dis*. 2025 Apr 27;16(1):347.
- [5] Akter H, Park M, Kwon OS, et al. Activation of matrix metalloproteinase-9 (MMP-9) by neurotensin promotes cell invasion and migration through ERK pathway in gastric cancer. *Tumour Biol*. 2015 Aug;36(8):6053-62.
- [6] Moody TW, Ramos-Alvarez I, Jensen RT. Adding of neurotensin to non-small cell lung cancer cells increases tyrosine phosphorylation of HER3. *Peptides*. 2022 Oct;156:170858.
- [7] Holmes BB, Rady JJ, Smith DJ, et al. Supraspinal neurotensin-induced antianalgesia in mice is mediated by spinal cholecystokinin. *Jpn J Pharmacol*. 1999 Feb;79(2):141-9.
- [8] Barnwal A, Tamang R, Sanjeev Das, et al. Ponatinib delays the growth of solid tumours by remodelling immunosuppressive tumour microenvironment through the inhibition of induced PD-L1 expression. *Br J Cancer*. 2023 Oct;129(6):1007-1021.

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