

## Product Data Sheet

Product Name: Neurotensin(8-13)

Cat. No.: GC36729

### Chemical Properties

Cas. No. 60482-95-3

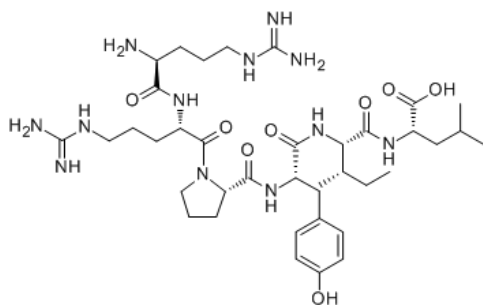
Formula  $C_{38}H_{64}N_{12}O_8$  M.Wt 816.99

Solubility Water: 50 mg/mL (61.20 mM) Storage Store at -20°C

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 stored below -20°C for several months.

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 NCI-H1299 cells (human non-small cell lung cancer cell line)

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

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**Preparation Method** NCI-H1299 cells were maintained in RPMI-1640 medium supplemented with 10% heat-inactivated fetal bovine serum (FBS) at 37°C, 5% CO<sub>2</sub>. Cells were treated with Neurotensin(8-13) at concentrations ranging from 1 nM to 1 μM for 2.5 minutes to 24 hours.

**Reaction Conditions** 1 nM to 1 μM; 2.5 minutes to 24 hours

**Applications** Neurotensin(8-13) induced transient tyrosine phosphorylation of focal adhesion kinase (FAK) in NCI-H1299 cells, with maximal phosphorylation observed 1–2.5 minutes after treatment. This effect was specific to the C-terminal fragment. The tyrosine phosphorylation was inhibited by the nonpeptide neurotensin receptor antagonist SR48692 (10 μM). Neurotensin(8-13) also bound with high affinity to NCI-H1299 cells (IC<sub>50</sub>=10 nM) and stimulated clonal growth in soft agar assays, while SR48692 suppressed proliferation.

### Animal experiment [2]:

**Animal models** Normotensive rats

**Preparation Method** Rats were anesthetized with Pentobarbital (55 mg/kg; i.p.), and a cannula was inserted into the femoral vein for peptide administration. Neurotensin(8-13) was dissolved in 0.9% NaCl and injected intravenously at doses ranging from 0.1 to 100 nmol/kg. Blood pressure and heart rate were monitored via the carotid artery.

**Dosage form** 0.1–100 nmol/kg; i.v.; Single injection.

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### Applications

Neurotensin(8-13) induced a dose-dependent decrease in diastolic blood pressure ( $ED_{50}=6.0\text{nmol/kg}$ ) without altering heart rate. At higher doses ( $\geq 3\text{nmol/kg}$ ), Neurotensin(8-13) elicited a triphasic depressor-pressor-depressor response, with effects lasting over 40 minutes at the highest dose ( $100\text{nmol/kg}$ ). Tachyphylaxis was observed upon repeated administration.

### References:

- [1] Leyton J, Garcia-Marin L, Jensen RT, et al. Neurotensin causes tyrosine phosphorylation of focal adhesion kinase in lung cancer cells. *Eur J Pharmacol.* 2002 May 10;442(3):179-86.
- [2] Di Paola ED, Richelson E. Cardiovascular effects of neurotensin and some analogues on rats. *Eur J Pharmacol.* 1990 Jan 17;175(3):279-83.

### Background

Neurotensin(8-13) is the core active fragment of neurotensin and functions as a biologically active neurotensin receptor (NTSR1) agonist. By binding to NTSR1 with high affinity ( $K_d \approx 1-10\text{nM}$ ), Neurotensin(8-13) activates the Gq/11 protein signaling pathway, thereby regulating intracellular calcium ion concentration and the activity of protein kinase C (PKC)<sup>[1-2]</sup>. Neurotensin(8-13) can be used in research related to pain management, psychiatric disorders (such as schizophrenia and depression), and tumor-targeted therapy<sup>[3-4]</sup>.

In vitro, human colon adenocarcinoma HT-29 cells were treated with Neurotensin(8-13) ( $3-100\text{nM}$ ) for 1–2 hours. Neurotensin(8-13) significantly induced rapid internalization mediated by the neurotensin receptor NTR1 and caused a time-dependent downregulation of NTR1 receptors on the cell surface<sup>[5]</sup>. Human non-small cell lung cancer cells NCI-H1299 were treated with Neurotensin(8-13) ( $100\text{nM}$ ) for 2.5 minutes, which significantly induced tyrosine phosphorylation of focal adhesion kinase (FAK). After treating NCI-H1299 cells with Neurotensin(8-13) ( $10\text{nM}$ ) for 24 hours, Neurotensin(8-13) promoted the proliferation of NCI-H1299 cells<sup>[6]</sup>.

In vivo, normotensive rats were injected via the femoral vein with Neurotensin(8-13) ( $0.1-100\text{nmol/kg}$ ). Neurotensin(8-13) dose-dependently reduced diastolic and systolic blood pressure without altering heart rate and showed no direct vasodilatory effect on isolated rat aortic rings<sup>[7]</sup>.

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Male Long-Evans rats received microinjections of Neurotensin(8-13) (3nmol in 0.5µl) into the ventral midbrain tegmental area. Neurotensin(8-13) significantly enhanced the reward effect of brain stimulation in the midbrain central gray matter 15–55 minutes after injection<sup>[8]</sup>.

### References:

- [1] Gilbert JA, McCormick DJ, Pfenning MA, et al. Neurotensin(8-13): comparison of novel analogs for stimulation of cyclic GMP formation in neuroblastoma clone N1E-115 and receptor binding to human brain and intact N1E-115 cells. *Biochem Pharmacol.* 1989 Oct 1;38(19):3377-82.
- [2] Cocioabă D, Fonseca AI, Leonte R, et al. Neurotensin (8-13) and Neuromedin N Neuropeptides Radiolabelling with Copper-64 Produced on Solid or Liquid Targets. *Molecules.* 2024 Mar 20;29(6):1390.
- [3] Li XM, Von Euler G, Hedlund PB, et al. The C-terminal neurotensin-(8-13) fragment potently modulates rat neostriatal dopamine D2 receptors. *Eur J Pharmacol.* 1993 Mar 30;234(1):125-8.
- [4] Pinnock RD, Woodruff GN. The non-peptide neurotensin receptor antagonist SR48692 is not a potent antagonist of neurotensin(8-13) responses of rat substantia nigra neurones in vitro. *Neurosci Lett.* 1994 May 19;172(1-2):175-8.
- [5] García-Garayoa E, Bläuenstein P, Bruehlmeier M, et al. Preclinical evaluation of a new, stabilized neurotensin(8--13) pseudopeptide radiolabeled with (99m)tc. *J Nucl Med.* 2002 Mar;43(3):374-83.
- [6] Leyton J, Garcia-Marin L, Jensen RT, et al. Neurotensin causes tyrosine phosphorylation of focal adhesion kinase in lung cancer cells. *Eur J Pharmacol.* 2002 May 10;442(3):179-86.
- [7] Di Paola ED, Richelson E. Cardiovascular effects of neurotensin and some analogues on rats. *Eur J Pharmacol.* 1990 Jan 17;175(3):279-83.
- [8] Rompré PP, Gratton A. Mesencephalic microinjections of neurotensin-(1-13) and its C-terminal fragment, neurotensin-(8-13), potentiate brain stimulation reward. *Brain Res.* 1993 Jul 9;616(1-2):154-62.

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