

Product Data Sheet

Product Name: C-type natriuretic peptide (1-22) (human, rat, swine)

Cat. No.: GC12034

Chemical Properties

Cas. No. 127869-51-6

Chemical Name (4R,5E,8Z,10S,11Z,14Z,16S,17Z,19S,20Z,22S,23E,26Z,28S,29Z,31S,32E,34S,35Z,37S,38E,40S,41Z,43S,44Z,47Z,49S,50Z,52R)-52-((Z)-((3Z,5S,6Z,8S,9Z,11S,12Z)-14-amino-5-(4-aminobutyl)-1,4,7,10,13-pentahydroxy-8-(hydroxymethyl)-11-isobutyl-3,6,9,12-tetraazatetradec

SMILES CC[C@]([C@@]1([H])/C(O)=N/C/C(O)=N/[C@@]/C(O)=N/[C@@]/C(O)=N/C/C(O)=N/[C@@]/C(O)=N/C/C(O)=N/[C@@](C(O)=O)([H])CSSC[C@@]/N=C(O)/C/N=C(O)/[C@]/N=C(O)/[C@]/N=C(O)/[C@]/N=C(O)/CN([H])CC(C)C([H])CO([H])CCCCN([H])/C(O)=N/[C@@]/C(O)=N/C

Formula C₉₃H₁₅₇N₂₇O₂₈S₃

M.Wt 2197.61

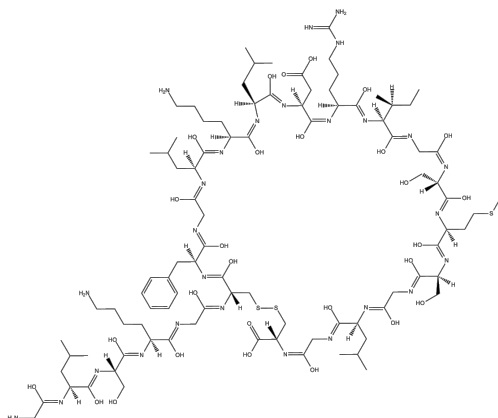
Solubility H₂O : 50 mg/mL (22.75 mM; adjust pH to 3 with 0.5%CH₃COOH)

Storage Desiccate 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

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

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Cell experiment [1]:

Cell lines CHO cells

Preparation Method To evaluate the human NPR (hNPR) agonist activities of the test compounds (C-type natriuretic peptide (1-22)). Using Chinese hamster ovarian (CHO) cells stably expressing hNPR-A or hNPR-B. Each compound was added to the cells in duplicate and incubated for 15min. Cells were lysed.

Reaction
Conditions 0.01-1000nM; 15min

Applications C-type natriuretic peptide (1-22) increased cGMP production in CHO cells expressing human NPR-B in a concentration-dependent manner.

Animal experiment [1]:

Animal models Sprague Dawley (SD) rats

Preparation Method Rats received C-type natriuretic peptide (1-22) or ASB20123 by intravenous (iv) injection into the tail vein or subcutaneous (sc) injection into the back.

Dosage form 20nmol/kg; i.v. or 50nmol/kg; s.c.

Applications C-type natriuretic peptide (1-22) could be transported across the vascular wall and reach NPR-B in peripheral tissues.

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References:

[1].Morozumi N, Yotsumoto T, Yamaki A, Yoshikiyo K, Yoshida S, Nakamura R, Jindo T, Furuya M, Maeda H, Minamitake Y, Kangawa K. ASB20123: A novel C-type natriuretic peptide derivative for treatment of growth failure and dwarfism. PLoS One. 2019 Feb 22;14(2):e0212680. doi: 10.1371/journal.pone.0212680. PMID: 30794654; PMCID: PMC6386482.

Background

C-type natriuretic peptide (1-22) (human, rat, swine) is an endogenous peptide found in plasma and cerebrospinal fluid^[2]. C-type natriuretic peptide (1-22) is a member of the natriuretic peptide (NP) family^[3]. C-type natriuretic peptide (1-22) is also a potent, endothelial-derived relaxant and growth-inhibitory factor^[6]. C-type natriuretic peptide (1-22) is an agonist for the natriuretic peptide receptor NPR2 (NPRB) and has an affinity for NPR3 (NPRC). C-type natriuretic peptide (1-22) can inhibit L-type calcium current in cardiomyocytes, has anti-proliferation effect in cardiac fibroblasts in vitro, and can promote vasodilation^[7].

In vitro, C-type natriuretic peptide (1-22) (0.01-1000nM) increased cGMP production in CHO cells expressing human Natriuretic Peptide Receptor-B (NPR-B) in a concentration-dependent manner^[1].

In vivo, C-type natriuretic peptide (1-22) could be transported across the vascular wall and reach NPR-B in peripheral tissues in SD rats^[1].C-type natriuretic peptide (1-22) (1µg/kg·min; i.v.; 3 weeks) improved endochondral ossification and accelerated bone growth in Ach mice^[4]. C-type natriuretic peptide (1-22) (2nmol; I.c.v.; once) induced an increase in the severity of picrotoxin-kindled convulsions 24 and 48hrs after application of the peptide in rats^[5].

References:

[1] Morozumi N, Yotsumoto T, et.al. ASB20123: A novel C-type natriuretic peptide derivative for treatment of growth failure and dwarfism. PLoS One. 2019 Feb 22;14(2):e0212680.

[2] Minamino N, Makino Y, et.al.Characterization of immunoreactive human C-type natriuretic peptide in brain and heart. Biochem Biophys Res Commun. 1991 Aug 30;179(1):535-42.

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- [3] Potter LR, Yoder AR, et.al. Natriuretic peptides: their structures, receptors, physiologic functions and therapeutic applications. Handb Exp Pharmacol. 2009;(191):341-66.
- [4] Yasoda A, Kitamura H, et.al. Systemic administration of C-type natriuretic peptide as a novel therapeutic strategy for skeletal dysplasias. Endocrinology. 2009 Jul;150(7):3138-44.
- [5] Mazarati AM, Halász E, et.al. ANP(1-28), BNP(1-32) and CNP(1-22) increase the severity of picrotoxin-kindled seizure syndrome in rats. Life Sci. 1993;52(3):PL19-24.
- [6] Buckley MG, Jenkins GH, et.al. Circulating C-type natriuretic peptide is increased in orthotopic cardiac transplant recipients and associated with cardiac allograft vasculopathy. Clin Sci (Lond). 2000 Nov;99(5):467-72. PMID: 11052928.
- [7] Pejchalova K, Krejci P, et.al. C-natriuretic peptide: an important regulator of cartilage. Mol Genet Metab. 2007 Nov;92(3):210-5. doi: 10.1016/j.ymgme.2007.06.014. Epub 2007 Aug 6. PMID: 17681481.

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