Product Data Sheet

Product Name: CCK Octapeptide, non-sulfated
Cat. No.: GC13327

Chemical Properties

Cas. No.	25679-24-7
Chemical Name	(3R,6S,9S,15R,18R,21R)-9-((1H-indol-3-yl)methyl)-21-amino-3-((R)-2-hydrazinyl-3-phenylpropanamido)-18-(4-hydroxybenzyl)-6,15-bis(2-(methylthio)ethyl)-4,7,10,13,16,19,20-heptaoxo-5,8,11,14,17-pentaazatricosane-1,23-dioic acid
SMILES	O=C([C@H](CCSC)NC([C@@H](CC(O)=O)NC([C@@H](CC1=CC=CC=C1)NN)=O)=O)N[C@H](C(NCC(N[C@@H](C(N[C@@H](C(C([C@@H](CC(O)=O)N)=O)=O)CC(C=C2)=CC=C2O)=O)CCSC)=O)=O)CC3=CNC4=CC=CC=C34
Formula	$C_{49}H_{62}N_{10}O_{13}S_2$
M.Wt	1063
Solubility	Soluble in 10% acetonitrile / sterile Water
Storage	Desiccate at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ 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	CCK Octapeptide, non-sulfated

Protocol

Cell experiment [1]:

Cell lines	Rat pancreatic acinar cells
Preparation Method	CCK Octapeptide(0.01 to 5nM) or secretin (2.5 to 500nM) was added directly to the incubation medium and cultured for 30min.
Reaction Conditions	0.01 to 5nM; 30min

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Applications	CCK Octapeptide was found to be more efficient compared to secretin in stimulating amylase release. A combination of secretin and CCK Octapeptide had a synergistic action in stimulating enzyme release by the acinar cells.

Animal experiment [2]:

Animal models	Aged female C57BL/6 mice (18 months old, 30–40g)
Preparation Method	A model of delayed neurocognitive recovery (dNCR) was established in aged mice by laparotomy. CCK Octapeptide was thawed daily and administered intraperitoneally at a dose of 1.6μg/kg from day0 to day 7 after surgery.
Dosage form	1.6μg/kg; i.p.; 8 days
Applications	Administration of CCK Octapeptide suppressed the activation of microglia, the induction of A1 reactive astrocytes, and the expression of tumor necrosis factor alpha, complement 1q, and interleukin 1 alpha in the hippocampus. CCK Octapeptide also promoted glutamatergic synaptogenesis and neurocognitive recovery in aged dNCR model mice.

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References:
[1]Lee P C. Effect of CCK-octapeptide and secretin on amylase secretion in isolated rat pancreatic acinar cells. Digestion. 1979;19(1):6-14.
[2]Chen L, Yang N, Li Y, et al. Cholecystokinin octapeptide improves hippocampal glutamatergic synaptogenesis and postoperative cognition by inhibiting induction of A1 reactive astrocytes in aged mice. CNS Neurosci Ther. 2021 Nov;27(11):1374-1384.

Background

CCK Octapeptide is a rapid-acting, synthetic analog of cholecystokinin which exist both in the central nervous system (CNS) and in the gastrointestinal tract. CCK Octapeptide accelerates the contraction of the gall bladder to release bile and promote food digestion, yet it reduces the entire digestive function by suppressing feeding behavior after its central administration. In relation to pain and analgesia, CCK Octapeptide antagonizes opioid analgesia at a lower dose[1] [2].

In vitro, in isolated rat pancreatic acinar cells,CCK Octapeptide(0.01 to 5nM) or secretin (2.5 to 500nM) was added directly to the incubation medium and cultured for 30min. CCK Octapeptide was found to be more efficient compared to secretin in stimulating amylase release. A combination of secretin and CCK Octapeptide had a synergistic action in stimulating enzyme release by the acinar cells[3]. Human peripheral-blood neutrophils were incubated with CCK Octapeptide (10^{-14} to 10^{-6}M) for 10min, 60min or 2h. CCK Octapeptide increased the adherence capacity and decreased the spontaneous mobility capacity of neutrophils. CCK Octapeptide also decreased the neutrophil ingestion capacity since it had an inhibitory effect on the latex bead phagocytosis by human neutrophils[4].

In vivo, delayed neurocognitive recovery (dNCR) mice model received a single intraperitoneal injection of CCK Octapeptide (1.6μg/kg) after laparotomy once daily from day 0 to day 7. CCK Octapeptide alleviated cognitive impairment and promoted glutamatergic synaptogenesis by

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inhibiting the induction of A1 reactive astrocytes and the activation of microglia[5]. Wistar male rats received morphine treatments for 5 consecutive days followed by saline injections to induce morphine withdrawal. On day 10 (5 days after the induction of morphine dependence), the rats received injections of three different doses of CCK Octapeptide (0.01, 0.1, and 1μg; i.c.v.). Administration of CCK Octapeptide before elevated plus-maze (EPM) testing decreased anxiety-like behavior in a dose-dependent fashion in morphine-withdrawal rats via CCK1 receptor activation and endogenous opioid peptides upregulation[6]. CCK Octapeptide was administered intraperitoneally (i.p.) at a single dose of 95 or 190ng per 100g body weight in a volume of 0.1ml/100g into adult male Wistar rats. Animals were sacrificed 30min post-injection. CCK Octapeptide produced no significant rise in plasma corticosterone levels[7].

References:

[1] Maher KA et al. Kinevac (sincalide for injection)/Squibb Diagnostics. Gastroenterol Nurs. 1991 Oct;14(2):98-100.
[2] Han J S, Ding X Z, Fan S G. Cholecystokinin octapeptide (CCK-8): antagonism to electroacupuncture analgesia and a possible role in electroacupuncture tolerance. Pain. 1986 Oct;27(1):101-115.
[3] Lee P C. Effect of CCK-octapeptide and secretin on amylase secretion in isolated rat pancreatic acinar cells. Digestion. 1979;19(1):6-14.
[4] Carrasco M, Del Rio M , Hernanz A, De la Fuente M. Inhibition of human neutrophil functions by sulfated and nonsulfated cholecystokinin octapeptides. Peptides. 1997;18(3):415-22
[5] Chen L, Yang N, Li Y, et al. Cholecystokinin octapeptide improves hippocampal glutamatergic synaptogenesis and postoperative cognition by inhibiting induction of A1 reactive astrocytes in aged mice. CNS Neurosci Ther. 2021 Nov;27(11):1374-1384.
[6] Wen D, Sun D, Zang G, et al. Cholecystokinin octapeptide induces endogenous opioid-dependent anxiolytic effects in morphine-withdrawal rats. Neuroscience. 2014 Sep 26:277:14-25.
[7]Itoh S, Hirota R, Katsuura G. Effect of cholecystokinin octapeptide and vasoactive intestinal polypeptide on adrenocortical secretion in the rat. Jpn J Physiol. 1982;32(4):553-60.

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