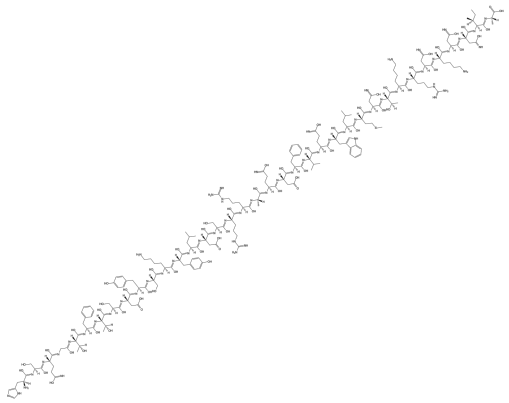
Product Data Sheet

Product Name: Oxyntomodulin
Cat. No.: GC16969

Chemical Properties

Cas. No.	62340-29-8		
SMILES	CC[C@]([C@@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/[C@](/N=C(O)/		
Formula	$C_{192}H_{295}N_{59}O_{60}S$	M.Wt	4421.86
Solubility	Soluble to 1 mg/ml in Water	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

Cell experiment [1]:

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Cell lines	SH-SY5Y cells (human neuroblastoma cell line)
Preparation Method	SH-SY5Y cells were serum-starved (with 0.5% serum) overnight before pretreatment with various concentrations of Oxyntomodulin (1–1000nM) for 1h. Cells were then exposed to glutamate (100–150μM) or H_2O_2 (150μM) for 24h.
Reaction Conditions	1–1000nM; 1 hours
Applications	Oxyntomodulin dose-dependently increased cell viability and protected against glutamate-induced excitotoxicity and oxidative stress. In SH-SY5Y cells, Oxyntomodulin (1–1000nM) effectively reduced glutamate (100mM)-mediated cell death, while higher concentrations (100nM) were required to counteract glutamate (150mM) toxicity.

Animal experiment [2]:

Animal models	Adult male Wistar rats
Preparation Method	Rats received intraperitoneal (i.p.) injections of Oxyntomodulin at doses of 3-100nmol/kg. For acute studies, food intake was measured after 24-hour fasting or during the dark phase. For chronic studies, rats received twice-daily i.p. injections of Oxyntomodulin (50nmol/kg) for 7 days.
Dosage form	3-100nmol/kg; i.p.

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Address: 10292 Central Ave. #205, Montclair, CA, USA

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Applications	Peripheral Oxyntomodulin administration dose-dependently inhibited both fast-induced and dark-phase food intake. Oxyntomodulin (30-100nmol/kg) significantly reduced cumulative food intake for up to 24 hours. Chronic administration for 7 days decreased body weight gain and adiposity (reduced white and brown adipose tissue mass) compared to pair-fed controls, suggesting effects beyond reduced caloric intake.

References:
[1] Li Y, Wu KJ, Yu SJ, et al. Neurotrophic and neuroprotective effects of oxyntomodulin in neuronal cells and a rat model of stroke. Exp Neurol. 2017 Feb;288:104-113.
[2] Dakin CL, Small CJ, Batterham RL, et al. Peripheral oxyntomodulin reduces food intake and body weight gain in rats. Endocrinology. 2004 Jun;145(6):2687-95.

Background

Oxyntomodulin is a 37-amino-acid peptide hormone that simultaneously activates both the glucagon-like peptide-1 receptor and the glucagon receptor, thereby regulating appetite, energy expenditure, and blood glucose levels[1]. Oxyntomodulin is a product of the glucagon precursor proglucagon and is produced and released by intestinal L-cells after processing by prohormone convertase [2]. Oxyntomodulin holds potential for the treatment of diabetes and obesity[3-4].

In vitro, pretreatment of SH-SY5Y cells with Oxyntomodulin (10–1000nM) for 1 hour, followed by stimulation with glutamate (100–150μM) or hydrogen peroxide (150μM) for 24 hours, significantly increased cell viability and reduced cell death induced by glutamate excitotoxicity and oxidative stress[5].

In vivo, Oxyntomodulin (4–25μg per mouse) was administered intravenously or intraperitoneally to 8–24-week-old C57BL/6J mice to simulate the regulation of liver circadian rhythms by food intake. When administered early in the circadian cycle, Oxyntomodulin acutely induced the expression of core liver clock genes Per1/2 and reset the rhythmic expression of hepatic clock genes (Per2, Dbp) and metabolism-related genes (Foxo1, Pdk4, Slc2a2), resulting in phase delays or reduced amplitude[6]. In Wistar rats weighing 180–400g, intraperitoneal injection of Oxyntomodulin (3–

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100nmol/kg) dose-dependently inhibited fasting-induced refeeding and dark-phase feeding without delaying gastric emptying. Additionally, peripheral injection of Oxyntomodulin significantly reduced fasting plasma ghrelin levels and increased c-fos immunoreactivity in the hypothalamic arcuate nucleus (ARC), suggesting that it suppresses appetite by activating ARC neurons[7].

References:

[1] Holst JJ, Rosenkilde MM. Oxyntomodulin - past, present and future. Peptides. 2025 Jun;188:171393.
[2] Holst JJ, Albrechtsen NJW, Gabe MBN, et al. Oxyntomodulin: Actions and role in diabetes. Peptides. 2018 Feb;100:48-53.
[3] Zhihong Y, Chen W, Qianqian Z, et al. Emerging roles of oxyntomodulin-based glucagon-like peptide-1/glucagon co-agonist analogs in diabetes and obesity. Peptides. 2023 Apr;162:170955.
[4] Wynne K, Field BC, Bloom SR. The mechanism of action for oxyntomodulin in the regulation of obesity. Curr Opin Investig Drugs. 2010 Oct;11(10):1151-7.
[5] Li Y, Wu KJ, Yu SJ, et al. Neurotrophic and neuroprotective effects of oxyntomodulin in neuronal cells and a rat model of stroke. Exp Neurol. 2017 Feb;288:104-113.
[6] Landgraf D, Tsang AH, Leliavski A, et al. Oxyntomodulin regulates resetting of the liver circadian clock by food. Elife. 2015 Mar 30;4:e06253.
[7] Dakin CL, Small CJ, Batterham RL, et al. Peripheral oxyntomodulin reduces food intake and body weight gain in rats. Endocrinology. 2004 Jun;145(6):2687-95.

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