Product Data Sheet

Product Name: Somatostatin
Cat. No.: GC33669

Chemical Properties

Cas. No.	51110-01-1		
SMILES	H-Ala-Gly-Cys-Lys-Asn-Phe-Phe-Trp-Lys-Thr-Phe-Thr-Ser-Cys-OH (Disulfide bridge: Cys3-Cys14)		
Formula		M.Wt	1637.88
Solubility	Water : 50 mg/mL (30.53 mM)	Storage	Store 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	Somatostatin		

Protocol

Cell experiment [1]:

Cell lines	HEK293 cells coexpressing sst-CFP (fluorescence donor) and D2-YFP (fluorescence acceptor)
Preparation Method	Somatostatin (1μM) was present in the incubation medium for 30min. FRET efficiency was measured by acceptor photobleaching.
Reaction Conditions	1μM; 30min

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Applications	The observed FRET efficiency was markedly increased compared to the non-treated cells (9.74 ± l.27% VS. l.83 ± 0.59%, respectively, p < 0.001). This result confirms previous reports that the heterodimerization of the Somatostatin Sst5 and dopamine D2 receptors is induced by agonist stimulation.

Animal experiment [2]:

Animal models	Wistar virgin female rats
Preparation Method	Wistar virgin female rats were injected subcutaneously (s.c.) twice a day with 20μg Somatostatin per 100g body weight (b.w.) for five consecutive days. Animal wre killed by decapitation under ether anesthesia, 12h after the last injection. Serum concentrations of FSH and LH were measured with radioimmunoassay (RIA) commercial kits. The cell volumes of the examined cells and their volume densities were estimated by light microscopy at 1,000× magnification using the M_{42} multipurpose test system.
Dosage form	20μg/100g; twice a day; 5 days; s.c.
Applications	Somatostatin treatment significantly decreased the volumes of both types of gonadotropic cells, reducing the volume of FSH- and LH-positive cells by approximately 35% and their volume densities by 16.0% and 22.1%, respectively. After the Somatostatin treatment, serum FSH and LH levels decreased by 31.3% and 40.9%, respectively.

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References:
[1] SZAFRAN K, ŁUKASIEWICZ S, FARON-GÓRECKA A, et al. Antidepressant drugs promote the heterodimerization of the dopamine D2 and somatostatin Sst5 receptors—fluorescence in vitro studies[J]. Pharmacological Reports, 2012, 64(5): 1253-1258.
[2] NESTOROVIĆ N, MANOJLOVIĆ-STOJANOSKI M, RISTIĆ N, et al. Somatostatin-14 influences pituitary–ovarian axis in peripubertal rats[J]. Histochemistry and Cell Biology, 2008, 130(4): 699-708.

Background

Somatostatin is a polypeptide hormone that inhibits the secretion of various hormones (such as growth hormone, insulin, and glucagon) by binding to G protein-coupled receptors SSTR1-5[1, 2]. Somatostatin, produced in the hypothalamus of the central nervous system and various peripheral tissues such as the neocortex and hippocampus, regulates multiple bodily functions by impeding the release of other hormones, gastrointestinal activity, and rapid cell proliferation[3, 4]. Somatostatin is commonly used in the treatment and research of conditions such as bleeding caused by gastrointestinal issues, various neuroendocrine tumors, and diabetic complications[2].

Product Data Sheet

In vitro, treatment of chicken cone photoreceptors with Somatostatin (500nM) for 2h significantly reduced the current density of L-type voltage-gated calcium channels (L-VGCCs) during the subjective night (circadian time (CT) 16-19), but no such effect was observed during the subjective day (CT 4-7)[5]. In HEK293 cells co-expressing Sst5-CFP (fluorescence donor) and D2-YFP (fluorescence acceptor) receptors, treatment with Somatostatin (1μM) for 30min significantly induced heterodimerization between Sst5 and dopamine D2 receptors, increasing the fluorescence resonance energy transfer (FRET) efficiency from 1.83% to 9.74%[6].

In vivo, subcutaneous injection of Somatostatin (20μg/100g body weight; twice a day) for 5 consecutive days to virgin female Wistar rats significantly reduced the cell volume and volume density of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) immunopositive cells, and markedly decreased serum levels of FSH and LH[7]. In swamp eels fed a high-fat diet, intraperitoneal implantation of Somatostatin (0.71mg/g body weight) via PLGA microspheres for 56 days significantly mitigated lipogenesis, reduced whole-body and muscle lipid accumulation, and increased serum high-density lipoprotein cholesterol (HDL-C) levels[8].

References:

[1] PATEL Y C. Somatostatin and its receptor family[J]. Frontiers in neuroendocrinology, 1999, 20(3): 157-198.
[2] GOMES-PORRAS M, CÁRDENAS-SALAS J, ÁLVAREZ-ESCOLÁ C. Somatostatin analogs in clinical practice: a review[J]. International journal of molecular sciences, 2020, 21(5): 1682.
[3] MARTEL G, DUTAR P, EPELBAUM J, et al. Somatostatinergic systems: an update on brain functions in normal and pathological aging[J]. Frontiers in endocrinology, 2012, 3: 154.
[4] LIGUZ-LECZNAR M, URBAN-CIECKO J, KOSSUT M. Somatostatin and somatostatin-containing neurons in shaping neuronal activity and plasticity[J]. Frontiers in neural circuits, 2016, 10: 48.
[5] JIAN K, BARHOUMI R, KO M L, et al. Inhibitory effect of somatostatin-14 on L-type voltage-gated calcium channels in cultured cone photoreceptors requires intracellular calcium[J]. Journal of neurophysiology, 2009, 102(3): 1801-1810.
[6] SZAFRAN K, ŁUKASIEWICZ S, FARON-GÓRECKA A, et al. Antidepressant drugs promote the heterodimerization of the dopamine D2 and somatostatin Sst5 receptors—

fluorescence in vitro studies[J]. Pharmacological Reports, 2012, 64(5): 1253-1258.
[7] NESTOROVIĆ N, MANOJLOVIĆ-STOJANOSKI M, RISTIĆ N, et al. Somatostatin-14 influences pituitary–ovarian axis in peripubertal rats[J]. Histochemistry and Cell Biology, 2008, 130(4): 699-708.
[8] CHAO B, LIAO S, CHEN Z, et al. Somatostatin-14 mitigates high-fat diet-induced lipid metabolic dysregulation in swamp eel (Monopterus albus)[J]. Aquaculture, 2025, 743114.

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