

Product Data Sheet

Product Name: Semaglutide

Cat. No.: GC31404

Chemical Properties

Cas. No. 910463-68-2

SMILES [Semaglutide]

Formula M.Wt 4113.58

Solubility DMSO : 3mg/mL (0.73 mM);
50mg/ml in H₂O 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

Semaglutide

Protocol

Cell experiment [1]:

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Cell lines BV2 cells

Preparation Method Cells were assigned to four groups as follows: i) The control group, treated with 1% DMSO; ii) the semaglutide group, treated with 900 nM semaglutide; iii) the lipopolysaccharide (LPS) + nigericin group, treated with 1 µg/ml LPS and 10 µM nigericin; and iv) the semaglutide + LPS + nigericin group, treated with 900 nM semaglutide followed by 1 µg/ml LPS and 10 µM nigericin.

Reaction Conditions 900 nM; 24h

Applications Semaglutide inhibits LPS- and nigericin-mediated lactate dehydrogenase (LDH) release in BV2 cells.

Animal experiment [2]:

Animal models C57BL/6 male mice

Preparation Method Normal mice and obese mice were randomly assigned to a diet plus Semaglutide or no Semaglutide. Semaglutide was administered subcutaneously to mice at 40 µg/kg once every 3 days (corresponding to 1.2 µg per animal). The stock semaglutide solution (1.34 mg/ml) was diluted in sterile 0.9% NaCl to 6.0 µg/ml so that an injection volume of 200 µl would contain 1.2 µg of the drug. Untreated groups were given sterile subcutaneous saline.

Dosage form 40 µg/kg once every 3 days; 4weeks; s.q

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Applications Semaglutide stimulates browning on subcutaneous fat adipocytes and mitigates inflammation and endoplasmic reticulum stress in visceral fat adipocytes of obese mice.

References:

- [1]. Wang L, Ding J, et, al. Semaglutide attenuates seizure severity and ameliorates cognitive dysfunction by blocking the NLR family pyrin domain containing 3 inflammasome in pentylenetetrazole-kindled mice. *Int J Mol Med*. 2021 Dec;48(6):219. doi: 10.3892/ijmm.2021.5052. Epub 2021 Oct 22. PMID: 34676876; PMCID: PMC8547541.
- [2]. Martins FF, Marinho TS, et, al. Semaglutide (GLP-1 receptor agonist) stimulates browning on subcutaneous fat adipocytes and mitigates inflammation and endoplasmic reticulum stress in visceral fat adipocytes of obese mice. *Cell Biochem Funct*. 2022 Dec;40(8):903-913. doi: 10.1002/cbf.3751. Epub 2022 Sep 28. PMID: 36169111.

Background

Semaglutide is a long-acting analogue of human glucagon-like peptide-1 and an agonist for the human glucagon-like peptide-1 (GLP-1) receptor. It reduces blood sugar, body weight and blood pressure and improves blood sugar control in adults with type 2 diabetes[1-2].

Semaglutide(900 nM; 24h) attenuated the LPS- and nigericin-induced inflammatory response and LDH release by blocking NLRP3 inflammasome activation in BV2 cells[3]. Semaglutide(5nM; 30min) promoted expression of GLP1R and activated PKG/PKCε/ERK1/2 signaling pathway in H/R H9C2 cells[4].

Semaglutide(40 µg/kg once every 3 days ; 4weeks ; s.q) showed significant anti-inflammatory effects and mitigated the ER stress in eWAT adipocytes of obese mice[5]. Semaglutide(30 nmol/kg/day ;i.p; 12 weeks)reduces body weight, improves glucose metabolism, inflammation and oxidative stress in obese mice[6]. Semaglutide(0.1 mg/kg; i. p) reduced blood glucose and promoted glucose metabolism in the brain of 3xTg mice via the SIRT1 pathway[7].

References:

- [1]. Frías JP, Davies MJ, et, al. SURPASS-2 Investigators. Tirzepatide versus Semaglutide Once

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- [2]. Chao AM, Tronieri JS, et, al. Semaglutide for the treatment of obesity. Trends Cardiovasc Med. 2023 Apr;33(3):159-166. doi: 10.1016/j.tcm.2021.12.008. Epub 2021 Dec 21. PMID: 34942372; PMCID: PMC9209591.
- [3]. Wang L, Ding J, et, al. Semaglutide attenuates seizure severity and ameliorates cognitive dysfunction by blocking the NLR family pyrin domain containing 3 inflammasome in pentylenetetrazole-kindled mice. Int J Mol Med. 2021 Dec;48(6):219. doi: 10.3892/ijmm.2021.5052. Epub 2021 Oct 22. PMID: 34676876; PMCID: PMC8547541.
- [4]. Zhu Q, Luo Y, et, al. Semaglutide inhibits ischemia/reperfusion-induced cardiomyocyte apoptosis through activating PKG/PKC ϵ /ERK1/2 pathway. Biochem Biophys Res Commun. 2023 Mar 5;647:1-8. doi: 10.1016/j.bbrc.2023.01.049. Epub 2023 Jan 17. PMID: 36706596.
- [5]. Martins FF, Marinho TS, et, al. Semaglutide (GLP-1 receptor agonist) stimulates browning on subcutaneous fat adipocytes and mitigates inflammation and endoplasmic reticulum stress in visceral fat adipocytes of obese mice. Cell Biochem Funct. 2022 Dec;40(8):903-913. doi: 10.1002/cbf.3751. Epub 2022 Sep 28. PMID: 36169111.
- [6]. Pan X, Yang L, et, al. Semaglutide ameliorates obesity-induced cardiac inflammation and oxidative stress mediated via reduction of neutrophil Cxcl2, S100a8, and S100a9 expression. Mol Cell Biochem. 2023 Jun 15. doi: 10.1007/s11010-023-04784-2. Epub ahead of print. PMID: 37318712.
- [7]. Wang ZJ, Li XR, et, al. Semaglutide ameliorates cognition and glucose metabolism dysfunction in the 3xTg mouse model of Alzheimer's disease via the GLP-1R/SIRT1/GLUT4 pathway. Neuropharmacology. 2023 Dec 1;240:109716. doi: 10.1016/j.neuropharm.2023.109716. Epub 2023 Sep 18. PMID: 37730113.

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