

Product Data Sheet

Product Name: Beinaglutide

Cat. No.: GC65080

Chemical Properties

Cas. No. 123475-27-4

Formula $C_{149}H_{225}N_{39}O_{46}$ M.Wt 3298.61

Solubility DMSO : 1.79 mg/mL (0.54 mM; ultrasonic and adjust pH to 5 with HCl) Storage Store at -20°C, protect from light, stored under nitrogen

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

HAEGTFTSDVSSYLEGQAAKEFIAWLVKGR

Protocol

Cell experiment [1]:

Cell lines 3T3-L1 adipocytes (mouse preadipocyte cell line)

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

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Preparation Method 3T3-L1 cells were differentiated into adipocytes in DMEM supplemented with 10% FBS, insulin, dexamethasone, and IBMX. Differentiated adipocytes were pretreated with Beinaglutide (100nM) for 48 hours in serum-free DMEM containing DPP-4 inhibitor (50μM) to prevent peptide degradation.

Reaction Conditions 100nM; 48h

Applications Beinaglutide significantly enhanced insulin-stimulated phosphorylation of Akt (Thr308 and Ser473) in 3T3-L1 adipocytes.

Animal experiment [2]:

Animal models C57BL/6 mice and ob/ob mice

Preparation Method Mice were subcutaneously administered Beinaglutide (0.15–2.4mg/kg) three times daily for 2–6 weeks. For acute studies, overnight-fasted mice received a single dose 30min before glucose loading (2g/kg, i.p.) or food intake assessment. In ob/ob-NASH models, mice were fed a high-fat/high-cholesterol diet for 9 weeks prior to 4-week Beinaglutide treatment.

Dosage form 0.15–2.4mg/kg; s.c.; Three times daily.

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Applications

Beinaglutide significantly reduced body weight gain, improved glucose tolerance, and enhanced insulin sensitivity in obese mice. Beinaglutide also attenuated hepatic steatosis, lowered plasma ALT/AST levels, and upregulated genes involved in fatty acid β -oxidation (e.g., Ppara, Acadl, Acox1) and mitochondrial function.

References:

- [1] Bodewits K, Raetz CR, Govan JR, et al. Antimicrobial activity of CHIR-090, an inhibitor of lipopolysaccharide biosynthesis, against the Burkholderia cepacia complex. Antimicrob Agents Chemother. 2010 Aug;54(8):3531-3.
- [2] Tan JH, Vidaillac C, Yam JKH, et al. In Vitro and In Vivo Efficacy of an LpxC Inhibitor, CHIR-090, Alone or Combined with Colistin against Pseudomonas aeruginosa Biofilm. Antimicrob Agents Chemother. 2017 Jun 27;61(7):e02223-16.

Background

Beinaglutide is a recombinant human glucagon-like peptide-1 (GLP-1) analog, sharing nearly 100% homology with human GLP-1(7-36)^[1-2]. Beinaglutide activates the GLP-1 receptor to promote insulin secretion, inhibit glucagon release, and delay gastric emptying, thereby exerting dose-dependent effects in blood glucose control, food intake suppression, and body weight reduction^[3-4].

In vitro, when 3T3-L1 adipocytes or primary adipocytes were pretreated with Beinaglutide for 48 hours and then co-stimulated with insulin (10nM) for 5 minutes, phosphorylation of Akt protein in the insulin signaling pathway was significantly enhanced. Additionally, Beinaglutide substantially altered the composition of glycerophospholipids (such as PC, PE) and sphingolipids (such as Ceramide) in adipocytes, reducing the content of the pro-inflammatory lipid Ceramide^[5].

In vivo, Beinaglutide (0.6–2.4mg/kg) was administered via subcutaneous injection three times daily for 2–4 weeks to diet-induced obese (DIO) ob/ob mice or ob/ob-NASH mouse models. Beinaglutide significantly reduced body weight gain, improved insulin sensitivity, and alleviated hepatic steatosis^[6].

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References:

- [1] Chen K, Chen L, Shan Z, et al. Beinaglutide for weight management in Chinese individuals with overweight or obesity: A phase 3 randomized controlled clinical study. *Diabetes Obes Metab.* 2024 Feb;26(2):690-698.
- [2] Han CY, Lu JP, Ye XM, et al. Effect of beinaglutide combined with metformin versus aspart 30 with metformin on metabolic profiles and antidrug antibodies in patients with type 2 diabetes: a randomized clinical trial. *Front Endocrinol (Lausanne).* 2023 Dec 6;14:1267503.
- [3] Gao L, Huang H, Zhang L, et al. Comparison of Beinaglutide Versus Metformin for Weight Loss in Overweight and Obese Non-diabetic Patients. *Exp Clin Endocrinol Diabetes.* 2022 Jun;130(6):358-367.
- [4] Fan Y, Xia M, Yan H, et al. Efficacy of beinaglutide in the treatment of hepatic steatosis in type 2 diabetes patients with nonalcoholic fatty liver disease: A randomized, open-label, controlled trial. *Diabetes Obes Metab.* 2024 Feb;26(2):772-776.
- [5] Zhang F, Chen Z, Wu D, et al. Recombinant human GLP-1 beinaglutide regulates lipid metabolism of adipose tissues in diet-induced obese mice. *iScience.* 2021 Oct 30;24(12):103382.
- [6] Fang X, Du Z, Duan C, et al. Beinaglutide shows significantly beneficial effects in diabetes/obesity-induced nonalcoholic steatohepatitis in ob/ob mouse model. *Life Sci.* 2021 Apr 1;270:118966.

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