

Product Data Sheet

Product Name: Hydroxy- α -sanshool

Cat. No.: GC36277

Chemical Properties

Cas. No. 83883-10-7

SMILES C/C=C/C=C/C=C\CC/C=C/C(NCC(C)(O)C)=O

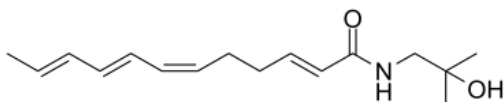
Formula $C_{16}H_{25}NO_2$ M.Wt 263.38

Solubility DMSO : 100 mg/mL (379.68 mM; Storage Store at -20°C, protect from light
Need ultrasonic)

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]:

Cell lines PC12 cells

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

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Preparation Method PC12 cells were pretreated with different concentrations of Hydroxy- α -sanshool (15, 30, and 60 μ M) for 2 hours and then incubated with 90 μ M H₂O₂ for another 4 hours. The control group was administered with the same amount of 1640 medium and then stimulated with H₂O₂. Hydroxy- α -sanshool was solubilized with DMSO and subsequently diluted in culture medium with the final concentration of DMSO less than 0.1% (v/v).

Reaction Conditions 15, 30, 60 μ M; 2h

Applications Hydroxy- α -sanshool showed a significant protective effect on H₂O₂-stimulated PC12 cells without significant cytotoxicity against normal PC12 cells. Hydroxy- α -sanshool also reduced H₂O₂-induced apoptosis of PC12 cells by decreasing intracellular ROS and increasing mitochondrial membrane potential (MMP).

Animal experiment [2]:

Animal models Type 2 diabetic mouse model (T2DM)

Preparation Method Male C57BL/6J mice were prepared as a model of T2DM. The mice were randomly divided into five groups, including HFD/STZ (HFD feeding plus STZ treatment), HFD/STZ+Metformin (Met 150mg/kg), HFD/STZ+Hydroxy- α -sanshool -L (HAS 1.25mg/kg), HFD/STZ+HAS-M (Hydroxy- α -sanshool 2.5mg/kg), and HFD/STZ+Hydroxy- α -sanshool-H (Hydroxy- α -sanshool 5mg/kg). Subsequently, Hydroxy- α -sanshool was dissolved in 0.5% CMC-Na, and mice in the NC+Hydroxy- α -sanshool (5mg/kg) and HFD/STZ+Hydroxy- α -sanshool (1.25, 2.5, 5mg/kg) groups were administered Hydroxy- α -sanshool orally at doses of 5mg/kg, 1.25mg/kg, 2.5mg/kg, or 5mg/kg for 4 weeks, respectively. The positive control treatment used in this study was Met, which was administered daily by gavage at 150mg/kg. The mice in the NC and HFD/STZ groups received vehicle solvent. During the experiment, changes in blood glucose, body weight, feed intake, and water intake were recorded.

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Dosage form 0.5, 1.25, 2.5, 5mg/kg; po; 4 weeks

Applications Hydroxy- α -sanshool reduces blood glucose in the T2DM mouse model by regulating glycogen metabolism through a mechanism involving the regulation of the PI3K/Akt/GSK3 β /GS signaling pathway.

References:

- [1]. Li R L, Zhang Q, Liu J, et al. Hydroxy- α -sanshool Possesses Protective Potentials on H₂O₂-Stimulated PC12 Cells by Suppression of Oxidative Stress-Induced Apoptosis through Regulation of PI3K/Akt Signal Pathway[J]. Oxidative Medicine and Cellular Longevity, 2020, 2020(1): 3481758.
- [2]. Zhang Q, Li R L, Wang L Y, et al. Hydroxy- α -sanshool isolated from Zanthoxylum bungeanum Maxim. has antidiabetic effects on high-fat-fed and streptozotocin-treated mice via increasing glycogen synthesis by regulation of PI3K/Akt/GSK-3 β /GS signaling[J]. Frontiers in Pharmacology, 2022, 13: 1089558.

Background

Hydroxy- α -sanshool is a transient receptor potential base 1 (TRPA1) and TRP vanilloid 1 (TRPV1) agonist with EC₅₀ values of 69 and 1.1 μ M, respectively, commonly used in hyperlipidemia studies [1].

In HaCaT cells, Hydroxy- α -sanshool (10-40 μ M; 24h) effectively inhibited intracellular ROS production induced by C. acnes. 10 μ M of Hydroxy- α -sanshool significantly reduced ROS levels in THP-1 cells [2]. Hydroxy- α -sanshool showed a significant protective effect on H₂O₂-stimulated PC12 cells without significant cytotoxicity against normal PC12 cells. Hydroxy- α -sanshool also reduced H₂O₂-induced apoptosis of PC12 cells by decreasing intracellular ROS and increasing mitochondrial membrane potential (MMP) [3].

Hydroxy- α -sanshool (0.5, 1.25, 2.5, 5mg/kg; po) reduces blood glucose in the T2DM mouse model by regulating glycogen metabolism through a mechanism involving the regulation of the PI3K/Akt/GSK3 β /GS signaling pathway [4]. In the insulin resistance model, the Hydroxy- α -sanshool (8mg/kg) intervention lowered serum total cholesterol and LDL cholesterol and significantly reduced triacylglycerol [5].

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- [1]. Riera C E, Menozzi-Smarrito C, Affolter M, et al. Compounds from Sichuan and Melegueta peppers activate, covalently and non-covalently, TRPA1 and TRPV1 channels[J]. British journal of pharmacology, 2009, 157(8): 1398-1409.
- [2]. Zhou X, Su Y, Wang H, et al. Hydroxy- α -sanshool has anti-inflammatory and antioxidant effects and affects the NF- κ B/STAT3 pathway via TRPV1 in acne[J]. Journal of Functional Foods, 2023, 110: 105823.
- [3]. Li R L, Zhang Q, Liu J, et al. Hydroxy- α -sanshool Possesses Protective Potentials on H₂O₂-Stimulated PC12 Cells by Suppression of Oxidative Stress-Induced Apoptosis through Regulation of PI3K/Akt Signal Pathway[J]. Oxidative Medicine and Cellular Longevity, 2020, 2020(1): 3481758.
- [4]. Zhang Q, Li R L, Wang L Y, et al. Hydroxy- α -sanshool isolated from Zanthoxylum bungeanum Maxim. has antidiabetic effects on high-fat-fed and streptozotocin-treated mice via increasing glycogen synthesis by regulation of PI3K/Akt/GSK-3 β /GS signaling[J]. Frontiers in Pharmacology, 2022, 13: 1089558.
- [5]. Xu F, Zhu Y, Lu M, et al. Effects of hydroxy-alpha-sanshool on intestinal metabolism in insulin-resistant mice[J]. Foods, 2022, 11(14): 2040.

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