

Product Data Sheet

Product Name: Gingerenone A

Cat. No.: GB10587

Chemical Properties

Cas. No. 128700-97-0

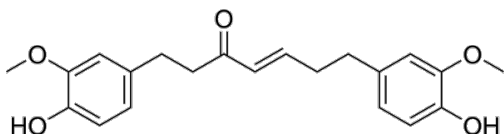
Formula $C_{21}H_{24}O_5$ M.Wt 356.41

Solubility DMSO : 100 mg/mL (280.58 mM); Storage 2-8°C
Need ultrasonic; Hygroscopic DMSO has a significant impact on the solubility of product, please use newly opened DMSO)

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 3T3-L1 adipocytes

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3T3-L1 adipocytes were cultured in serum-free medium overnight. Gingerenone A at indicated concentrations (2.5–40 μ M) or PF-4708671 (10 μ M) was added and incubated for 5h, followed by stimulation with 100nM insulin for 20minutes.

Unstimulated cells were included as a negative control. Cells were harvested

Preparation Method and lysed in NP-40 lysis buffer containing 1% NP-40; 50mM Tris-HCl, pH 8.0; 150mM NaCl; 5mM EDTA; 10 μ g/ml aprotinin; 10 μ g/ml leupeptin; 1mM phenylmethylsulfonyl fluoride; 2mM sodium pervanadate. Protein phosphorylation and total amounts of proteins were analyzed by Western blot with the indicated antibodies.

Reaction
Conditions 2.5, 5, 10, 20 and 40 μ M; 5h

Applications Gingerenone A induced phosphatidylinositide-3 kinase (PI3K) feedback activation and increased insulin receptor tyrosine phosphorylation in L6 myotubes and IRS-1 binding to the PI3K.

Animal experiment [2]:

Animal models SPF Male C57 mice

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Preparation Method	The mice were housed at a temperature of 20–24 °C, relative humidity of 55 ± 10%, and a light/dark cycle of 12–12h. the SLI mouse model was treated by 7days of dextran sodium sulfate (DSS) free drinking. mice were randomly grouped into an average of 10 mice per group. The groups were set as the control group (Ctrl), 4% DSS group, 4% DSS+5-ASA (50mg/kg) group, 4% DSS+Gingerenone A (5mg/kg) group (GAL), and 4% DSS+Gingerenone A (20mg/kg) group (GAH). During DSS treatment, mice in the control were given distilled water, and the rest of the groups were given the corresponding drugs; body weights were assessed daily. The livers were removed, and a portion was cut and soaked in 4% paraformaldehyde for pathology.
Dosage form	5,20mg/kg/day for 7days; p.o.
Applications	Gingerenone A alleviated DSS-induced hepatic pathological damage, liver parameters, and cytokine levels, increased the antioxidant enzyme activities, attenuated ferroptosis in DSS-induced liver injury and upregulated Gpx4 expression.

References:

- [1]Chen, J., Sun, J., Prinz, R. A., Li, Y., & Xu, X. (2018). Gingerenone A Sensitizes the Insulin Receptor and Increases Glucose Uptake by Inhibiting the Activity of p70 S6 Kinase. *Molecular nutrition & food research*, 62(23), e1800709.
- [2]Chen, Y., Zhu, S., Chen, Z., Liu, Y., Pei, C., Huang, H., Hou, S., Ning, W., & Liang, J. (2022). Gingerenone A Alleviates Ferroptosis in Secondary Liver Injury in Colitis Mice via Activating Nrf2-Gpx4 Signaling Pathway. *Journal of agricultural and food chemistry*, 70(39), 12525–12534.

Background

Gingerenone A is an orally active Nrf2-Gpx4 activator with an EC₅₀ value of 24μM^[1]. Nrf2-Gpx4 pathway is a key signaling pathway in cellular antioxidant defense^[2]. Gingerenone A is commonly

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used for research on anti-inflammation, anti-diabetes, anti-tumor, and aging-related mechanisms^[3].

In vitro, treatment of 3T3-L1 cells or L6 myotubes with Gingerenone A (2.5–40 μM) for 5h induced phosphatidylinositol-3 kinase (PI3K) feedback activation and increased insulin receptor tyrosine phosphorylation in L6 myotubes and IRS-1 binding to the PI3K^[4]. Treatment of MCF7 and MDA-MB-231 cells with 80 μM Gingerenone A increased ROS levels and induced G2/M phase delay and senescence^[5].

In vivo, oral administration of high-fat diet (HFD)-induced obese mice with Gingerenone A (50mg/kg/day) for 15 weeks significantly reduced fat mass increase and inhibited obesity and adipose tissue inflammation in mice by decreasing adipocyte size^[6]. Oral treatment of dextran sodium sulfate (DSS)-induced secondary liver injury (SLI) mice with Gingerenone A (5, 20mg/kg, p.o., once a day for 7 days) alleviated DSS-induced hepatic pathological damage, liver parameters, and cytokine levels, increased the antioxidant enzyme activities, attenuated ferroptosis in DSS-induced liver injury and upregulated Gpx4 expression^[7].

References:

- [1] Changtam, C., de Koning, H. P., Ibrahim, H., Sajid, M. S., Gould, M. K., & Suksamrarn, A. (2010). Curcuminoid analogs with potent activity against Trypanosoma and Leishmania species. *European journal of medicinal chemistry*, 45(3), 941–956.
- [2] Zhang, S., Sun, Z., Jiang, X., Lu, Z., Ding, L., Li, C., Tian, X., & Wang, Q. (2022). Ferroptosis increases obesity: Crosstalk between adipocytes and the neuroimmune system. *Frontiers in immunology*, 13, 1049936.
- [3] Moaddel, R., Rossi, M., Rodriguez, S., Munk, R., Khadeer, M., Abdelmohsen, K., Gorospe, M., & Ferrucci, L. (2022). Identification of gingerenone A as a novel senolytic compound. *PloS one*, 17(3), e0266135.
- [4] Chen, J., Sun, J., Prinz, R. A., Li, Y., & Xu, X. (2018). Gingerenone A Sensitizes the Insulin Receptor and Increases Glucose Uptake by Inhibiting the Activity of p70 S6 Kinase. *Molecular nutrition & food research*, 62(23), e1800709.
- [5] Yu, T. J., Tang, J. Y., Shiau, J. P., Hou, M. F., Yen, C. H., Ou-Yang, F., Chen, C. Y., & Chang, H. W. (2022). Gingerenone A Induces Antiproliferation and Senescence of Breast Cancer Cells. *Antioxidants (Basel, Switzerland)*, 11(3), 587.
- [6] Suk, S., Kwon, G. T., Lee, E., Jang, W. J., Yang, H., Kim, J. H., Thimmegowda, N. R., Chung, M. Y., Kwon, J. Y., Yang, S., Kim, J. K., Park, J. H. Y., & Lee, K. W. (2017). Gingerenone A, a

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polyphenol present in ginger, suppresses obesity and adipose tissue inflammation in high-fat diet-fed mice. Molecular nutrition & food research, 61(10), 10.1002/mnfr.201700139.

[7] Chen, Y., Zhu, S., Chen, Z., Liu, Y., Pei, C., Huang, H., Hou, S., Ning, W., & Liang, J. (2022). Gingerenone A Alleviates Ferroptosis in Secondary Liver Injury in Colitis Mice via Activating Nrf2-Gpx4 Signaling Pathway. Journal of agricultural and food chemistry, 70(39), 12525–12534.

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