

Product Data Sheet

Product Name: Ginsenoside Rb1

Cat. No.: GN10156

Chemical Properties

Cas. No. 41753-43-9

Chemical Name Ginsenoside Rb1

SMILES CC(=CCCC(C)(C1CCC2(C1C(CC3C2(CCC4C3(CCC(C4(C)C)OC5C(C(C(C(O5)CO)O)OC6C(C(C(C(O6)CO)O)O)O)C)C)O)C)OC7C(C(C(C(O7)COC8C(C(C(C(O8)CO)O)O)O)O)O)C

Formula C₅₄H₉₂O₂₃

M.Wt 1109.29

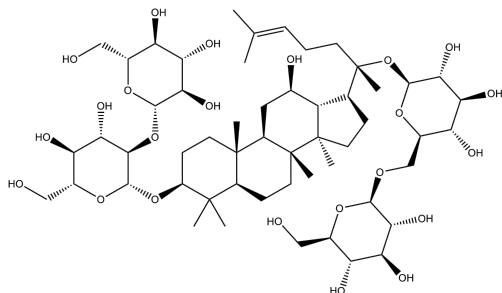
Solubility ≥ 51.1mg/mL in DMSO

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



Protocol

Cell experiment [1]:

Cell lines HUVECs (human umbilical vein endothelial cells)

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

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Preparation Method	HUVECs were maintained in M199 medium supplemented with 20% fetal bovine serum and 60µg/ml endothelial cell growth supplement at 37°C in a 5% CO ₂ incubator. HUVECs were pretreated with Ginsenoside Rb1 at concentrations of 10 or 20µM for 30min prior to H ₂ O ₂ treatment.
Reaction Conditions	10-20µM; pretreatment 30min.
Applications	Ginsenoside Rb1 significantly decreased the SA-β-gal-positive cell number and attenuated cell senescence induced by H ₂ O ₂ in a dose-dependent manner. Ginsenoside Rb1 restored the H ₂ O ₂ -induced reduction of SIRT1 expression and activation of AMPK phosphorylation. Ginsenoside Rb1 increased endothelial nitric oxide synthase expression and nitric oxide production, and suppressed PAI-1 expression.
Animal experiment [2]:	
Animal models	C57BL/6JGpt mice (72-week-old)
Preparation Method	Mice were randomly grouped and received intraperitoneal injections of either PBS or 20mg/kg Ginsenoside Rb1 for 6 weeks (6 days of injections followed by 1 day of rest per week). Young mice (12-week-old) served as controls. Aortic tissues were analyzed using histomorphology, atomic force microscopy, senescence biomarkers, apoptosis assay, and DNA damage detection.
Dosage form	20mg/kg; i.p.; 6 days per week for 6 weeks.

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Applications

Ginsenoside Rb1 significantly alleviated structural remodeling of the aging aorta, restored smooth muscle cell alignment and extracellular matrix organization. Ginsenoside Rb1 ameliorated aging-induced impairments in nanobiomechanical properties. Ginsenoside Rb1 downregulated p21 expression, reduced SA- β -gal positive area percentage, decreased apoptotic cells, and significantly alleviated the elevation of γ -H2AX in the aging aorta.

References:

- [1] Zheng Z, Wang M, Cheng C, et al. Ginsenoside Rb1 reduces H₂O₂-induced HUVEC dysfunction by stimulating the sirtuin-1/AMP-activated protein kinase pathway. Mol Med Rep. 2020 Jul;22(1):247-256.
- [2] Si Q, Wu L, Zhang X, et al. Ginsenoside Rb1 attenuates arterial aging by reducing DNA damage in aged mice. Exp Gerontol. 2026 Feb;214:113011.

Background

Ginsenoside Rb1 is a natural active ingredient extracted from ginseng that can modulate the activity of multiple signaling pathways. Ginsenoside Rb1 inhibits Na⁺,K⁺-ATPase activity (IC₅₀=6.3±1.0 μ M). Ginsenoside Rb1 can be used in research on diseases such as cancer, cardiovascular and cerebrovascular diseases, and asthma^[1-4].

In vitro, WI-38 cells were treated with Ginsenoside Rb1 (20–30 μ M) and LPS (2.5–10mg/ml) for 24h. Ginsenoside Rb1 significantly reversed the LPS-induced decrease in cell viability, apoptosis, and production of pro-inflammatory factors (IL-1 β , IL-6, TNF- α); Ginsenoside Rb1 downregulated miR-222 expression and inhibited NF- κ B pathway activation^[5]. HUVECs were pretreated with Ginsenoside Rb1 (10–20 μ M) for 30min, followed by stimulation with H₂O₂ (60 μ M) for 1h and then cultured for another 24h. Ginsenoside Rb1 significantly reduced the number of SA- β -gal-positive cells and PAI-1 expression, while increasing eNOS expression and NO production, and restored SIRT1 expression and AMPK phosphorylation^[6].

In vivo, aged C57BL/6J mice received intraperitoneal injections of Ginsenoside Rb1 (20mg/kg; 6 days per week) for 6 weeks. Ginsenoside Rb1 significantly alleviated age-related aortic structural

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remodeling and DNA damage^[7]. In ovariectomized C57BL/6J mice, Ginsenoside Rb1 (12.5 or 50mg/kg; single or 7 days) was administered intraperitoneally 1 hour before ISO (200mg/kg) treatment. Ginsenoside Rb1 significantly attenuated ISO-induced myocardial injury and cardiomyocyte necrosis^[8].

References:

- [1] Cao J, Zheng YQ, Liu TP, et al. Inhibitory effects of ginsenoside Rg1 and Rb1 on rat brain microsomal Na⁺,K⁺-ATPase activity. Zhongguo Yao Li Xue Bao. 1990 Jan;11(1):10-4.
- [2] Zhang J, Cao L, Wang H, et al. Ginsenosides Regulate PXR/NF-κB Signaling and Attenuate Dextran Sulfate Sodium-Induced Colitis. Drug Metab Dispos. 2015 Aug;43(8):1181-9.
- [3] Joh EH, Lee IA, Jung IH, et al. Ginsenoside Rb1 and its metabolite compound K inhibit IRAK-1 activation--the key step of inflammation. Biochem Pharmacol. 2011 Aug 1;82(3):278-86.
- [4] He S, Ye H, Wang Q, et al. Ginsenoside Rb1 targets to HO-1 to improve sepsis by inhibiting ferroptosis. Free Radic Biol Med. 2025 Jan;226:13-28.
- [5] Wei E, Fang X, Jia P, et al. Ginsenoside Rb1 Alleviates Lipopolysaccharide-Induced Inflammatory Injury by Downregulating miR-222 in WI-38 Cells. Cell Transplant. 2021 Jan-Dec;30:9636897211002787.
- [6] Zheng Z, Wang M, Cheng C, et al. Ginsenoside Rb1 reduces H₂O₂-induced HUVEC dysfunction by stimulating the sirtuin-1/AMP-activated protein kinase pathway. Mol Med Rep. 2020 Jul;22(1):247-256.
- [7] Si Q, Wu L, Zhang X, et al. Ginsenoside Rb1 attenuates arterial aging by reducing DNA damage in aged mice. Exp Gerontol. 2026 Feb;214:113011.
- [8] Wang Y, Tang X, Cui J, et al. Ginsenoside Rb1 mitigates acute catecholamine surge-induced myocardial injuries in part by suppressing STING-mediated macrophage activation. Biomed Pharmacother. 2024 Jun;175:116794.

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