

Product Data Sheet

Product Name: Notoginsenoside R1

Cat. No.: GN10695

Chemical Properties

Cas. No. 80418-24-2

Chemical Name Notoginsenoside R1

SMILES CC(=CCCC(C)(C1CCC2(C1C(CC3C2(CC(C4C3(CCC(C4(C)C)O)C)OC5C(C(C(C(O5)CO)O)O)OC6C(C(C(CO6)O)O)O)C)O)C)OC7C(C(C(C(O7)CO)O)O)O)C

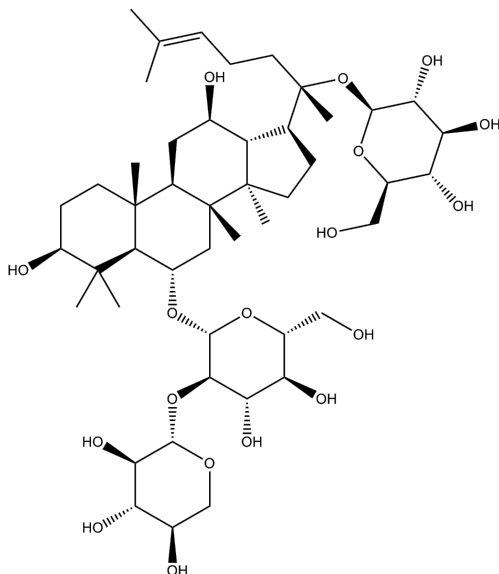
Formula $C_{47}H_{80}O_{18}$ M.Wt 933.13

Solubility DMF: 15 mg/ml, DMSO: 10 mg/ml, Ethanol: 0.1 mg/ml, PBS (pH 7.2): 1 mg/ml Storage Store at -20°C, protect from light

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



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

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Protocol

Cell experiment [1]:

Cell lines HepG2 and MHCC97H cells (human hepatocellular carcinoma cell lines)

Preparation Method Cells were maintained in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% fetal bovine serum (FBS) at 37°C, 5% CO₂. Cells were treated with Notoginsenoside R1 at concentrations of 0–150µM for 72 hours.

Reaction
Conditions 0–150µM; 72h

Applications Notoginsenoside R1 significantly reduced cell viability in a dose-dependent manner and increased caspase-3 activity, indicating induction of apoptosis in hepatocellular carcinoma cells.

Animal experiment [2]:

Animal models C57/BL6 mice

Preparation Method Mice were subjected to myocardial ischemia/reperfusion (MI/R) injury by occluding the left anterior descending coronary artery (LAD) for 30min followed by 4h reperfusion. Notoginsenoside R1 (25mg/kg, dissolved in normal saline) was intraperitoneally injected three times, starting 30min prior to ischemic surgery.

Dosage form 25mg/kg; i.p.

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Applications Notoginsenoside R1 significantly reduced myocardial infarction area, lowered plasma cardiac troponin-I (cTnI) and creatine kinase-MB (CK-MB) levels, and decreased TUNEL-positive apoptotic cells in the infarct border zone.

References:

- [1] Li H, Zhu J, Xu YW, et al. Notoginsenoside R1-loaded mesoporous silica nanoparticles targeting the site of injury through inflammatory cells improves heart repair after myocardial infarction. *Redox Biol.* 2022 Aug;54:102384.
- [2] Zeng JJ, Shi HQ, Ren FF, et al. Notoginsenoside R1 protects against myocardial ischemia/reperfusion injury in mice via suppressing TAK1-JNK/p38 signaling. *Acta Pharmacol Sin.* 2023 Jul;44(7):1366-1379.

Background

Notoginsenoside R1 is a major active saponin component isolated from *Panax notoginseng* and is a key bioactive compound in many traditional Chinese medicine formulations^[1]. Notoginsenoside R1 can improve the recovery of neurological function following cerebral ischemia-reperfusion injury^[2]. Notoginsenoside R1 can be used to study its protective effects on vascular endothelial cells and nerve cells^[3]. Notoginsenoside R1 also has potential pharmacological activities in improving cardiac repair after myocardial infarction, alleviating cognitive deficits in a diabetes-induced Alzheimer's disease model, and regulating glucose and lipid metabolism^[4].

In vitro, treatment of hepatocellular carcinoma cell lines HepG2 and MHCC97H with Notoginsenoside R1 (0-150 μ M) for 72 hours significantly reduced cell viability and induced an increase in caspase-3 activity, indicating Notoginsenoside R1 promotion of tumor cell apoptosis^[5]. Pretreatment of H9C2 cardiomyocytes and primary cardiomyocytes with Notoginsenoside R1 (100 μ M) for 30 minutes, followed by treatment with H₂O₂ (350 μ M) or oxygen-glucose deprivation (OGD), significantly inhibited the accumulation of reactive oxygen species (ROS) and mitochondrial superoxide generation, while also reducing cell apoptosis^[6].

In vivo, oral pretreatment of neonatal rats with Notoginsenoside R1 (12.5-50mg/kg) from postnatal day 2 to day 7, followed by exposure to 3% sevoflurane for 6 hours, significantly reduced neuronal

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apoptosis in the CA1, CA3, and DG regions of the hippocampus^[7]. Intraperitoneal injection of Notoginsenoside R1 (25mg/kg) 30 minutes before myocardial ischemia (every 2 hours; a total of 3 times) significantly reduced the myocardial infarction area and decreased the levels of plasma myocardial injury markers cTnl and CK-MB^[8].

References:

- [1] Guo S, Xi X, Li J. Notoginsenoside R1: A systematic review of its pharmacological properties. Pharmazie. 2019 Nov 1;74(11):641-647.
- [2] Tong Q, Zhu PC, Zhuang Z, et al. Notoginsenoside R1 for Organs Ischemia/Reperfusion Injury: A Preclinical Systematic Review. Front Pharmacol. 2019 Oct 17;10:1204.
- [3] Zhu T, Xie WJ, Wang L, et al. Notoginsenoside R1 activates the NAMPT-NAD⁺-SIRT1 cascade to promote postischemic angiogenesis by modulating Notch signaling. Biomed Pharmacother. 2021 Aug;140:111693.
- [4] Wen C, Liao X, Ye X, et al. Pharmacokinetics and Biological Activities of Notoginsenoside R1: A Systematical Review. Am J Chin Med. 2025;53(1):205-249.
- [5] Li H, Zhu J, Xu YW, et al. Notoginsenoside R1-loaded mesoporous silica nanoparticles targeting the site of injury through inflammatory cells improves heart repair after myocardial infarction. Redox Biol. 2022 Aug;54:102384.
- [6] Li H, Zhu J, Xu YW, et al. Notoginsenoside R1-loaded mesoporous silica nanoparticles targeting the site of injury through inflammatory cells improves heart repair after myocardial infarction. Redox Biol. 2022 Aug;54:10238.
- [7] Zhang Y, Zhao Y, Ran Y, et al. Notoginsenoside R1 attenuates sevoflurane-induced neurotoxicity. Transl Neurosci. 2020 Jun 22;11(1):215-226.
- [8] Zeng JJ, Shi HQ, Ren FF, et al. Notoginsenoside R1 protects against myocardial ischemia/reperfusion injury in mice via suppressing TAK1-JNK/p38 signaling. Acta Pharmacol Sin. 2023 Jul;44(7):1366-1379.

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