

Product Data Sheet

Product Name: Reuterin
Cat. No.: GC49790

Chemical Properties

Cas. No. 2134-29-4

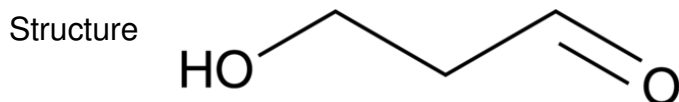
SMILES O=CCCCO

Formula C3H6O2 M.Wt 74.1

Solubility DMF: 25 mg/mL, DMSO: 20 mg/mL, Ethanol: 16 mg/mL, PBS (pH 7.2): 5 mg/mL
Storage -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.



Protocol

Cell experiment [1]:

Cell lines	HCC-LM9, HuH7, SK-Hep1 cells (human hepatocellular carcinoma cell line), HuCC T1 cells, RBE cells (human cholangiocarcinoma cell line), Hep3B cells (human hepatocellular carcinoma cell line)
------------	--

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method	HCC-LM9, HuH7, SK-Hep1, HuCC T1, RBE and Hep3B cells were maintained in DMEM or MEM medium supplemented with 10% fetal bovine serum, 100U/mL penicillin and 10mg/L streptomycin at 37°C, 5% CO ₂ . Cells were treated with Reuterin at indicated concentrations (HCC-LM9 and HuH7: 100μM and 200μM; others per IC ₅₀) for 24 hours. After treatment, cell viability was determined by CCK8 assay, colony formation assay and EdU incorporation assay. Protein lysates were collected for western blotting to detect caspase-1, GSDMD, IL-1β, caspase-8, STING, p-TBK1, p-IRF3, p-STAT1, p-Drp1. Cytosolic mtDNA was isolated and detected by qPCR. Mitochondrial morphology was observed by Mito-Tracker Green staining.
Reaction Conditions	100-200μM; 24h
Applications	Reuterin decreased cell viability, reduced colony numbers and EdU incorporation rates in HCC-LM9, HuH7, SK-Hep1, HuCC T1, RBE and Hep3B cells. Reuterin activated caspase-1 and GSDMD, increased cleavage of IL-1β, upregulated caspase-8 expression, promoted leakage of mtDNA into cytosol, activated STING-TBK1-IRF3 signaling pathway, impaired mitophagy, blocked mtDNA replication and mitochondrial fission, and induced pyroptosis.
Animal experiment [2]:	
Animal models	12-week-old female Wistar rats
Preparation Method	Rats were ovariectomized (OVX) and two weeks post-surgery received intraperitoneal injections of Reuterin (10mg/kg) every other day for 8 weeks. For biomechanical evaluation, the right femora were subjected to three-point bending assay. For dynamic bone formation, rats received calcein labeling (20mg/kg, i.p.) at 14 days and 3 days before euthanasia. Femoral specimens were collected for micro-CT, histological, immunohistochemical, and TRAP staining analyses.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Dosage form	10mg/kg; i.p.; every other day for 8 weeks
Applications	Reuterin mitigated trabecular bone loss, restored bone volume fraction, trabecular number and thickness, and reduced trabecular separation. Reuterin enhanced bone stiffness, ultimate load and energy to fracture. Reuterin increased mineral apposition rate and osteoblast surface, reduced the number of TRAP-positive osteoclasts, and decreased marrow adipocyte counts. Reuterin upregulated COL1A1 and downregulated PPAR γ immunoreactivity in trabecular bone and bone marrow stroma, and upregulated ID1, ID2 and BGLAP mRNA levels in femoral bone tissue.
References:[1] Cui L, Xu X, Fan H, et al. Reuterin promotes pyroptosis in hepatocellular cancer cells through mtDNA-mediated STING activation and caspase 8 expression. <i>Cancer Lett.</i> 2024;601:217183.[2] Wei J, Xu F, He Z, et al. Reuterin drives osteogenic and suppresses adipogenic differentiation of bone marrow mesenchymal stem cells via BMP/SMAD signaling to ameliorate osteoporosis. <i>Tissue Cell.</i> 2027;104:103791.	

Background

Reuterin is a broad-spectrum antimicrobial small molecule produced by *Lactobacillus reuteri* during anaerobic fermentation of glycerol. Reuterin inhibits the growth of Gram-positive bacteria, Gram-negative bacteria, yeasts, fungi, and protozoa by modifying thiol groups in microbial proteins and small molecules and inducing oxidative stress. Reuterin can be used in food preservation, intestinal flora regulation, anti-infection, and related research^[1-4].

In vitro, HaCat cells induced by *Streptococcus mutans* or *Porphyromonas gingivalis* were treated with 12.5%-100% Reuterin for 15min-24h. Reuterin decreased IL-8 mRNA expression and increased hBD-2 mRNA expression^[5]. HepG2 cells were treated with 78.12 μ M-10mM Reuterin for 24h. Reuterin reduced cellular substance transport capacity, inhibited metabolic activity, and disrupted cell membrane integrity^[6]. HCC-LM9, HuH7, SK-Hep1, HuCC T1, RBE, and Hep3B cells were treated with 100-200 μ M Reuterin for 24h. Reuterin decreased cell viability, reduced colony numbers, induced pyroptosis, and inhibited mitophagy^[7].

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

In vivo, EHEC O157:H7-infected BALB/c mice received daily oral gavage of 300µL 60mM Reuterin for 7 days. Reuterin alleviated colonic pathological damage, decreased malondialdehyde content in colon tissue, increased superoxide dismutase activity, and reduced EHEC O157:H7 load in the colon^[8]. Ovariectomized Wistar rats received intraperitoneal injection of 10mg/kg Reuterin every other day for 8 weeks. Reuterin mitigated tibial trabecular bone loss, improved femoral biomechanical properties, reduced bone marrow adipose tissue expansion, increased mineral apposition rate and osteoblast surface, decreased PPAR γ signaling, upregulated ID1, ID2, and BGLAP expression, and reduced TRAP-positive osteoclast numbers^[9].

References:

- [1] Chen YC, Chang WH, Chang Y, et al. A natural compound (reuterin) produced by *Lactobacillus reuteri* for hemoglobin polymerization as a blood substitute. *Biotechnol Bioeng*. 2004 Jul 5;87(1):34-42.
- [2] Gao Y, Wang P, Huang S, et al. Antibacterial reuterin as a multifunctional crosslinker for constructing chitosan-based hydrogels to promote infected wound healing. *Int J Biol Macromol*. 2025;316:144494.
- [3] Sung HW, Chen CN, Chang Y, et al. Biocompatibility study of biological tissues fixed by a natural compound(reuterin) produced by *lactobacillus reuteri*. *Biomaterials*. 2002;23(16):3203-3214.
- [4] Bell HN, Rebernick RJ, Goyert J, et al. Reuterin in the healthy gut microbiome suppresses colorectal cancer growth through altering redox balance. *Cancer Cell*. 2022 Feb 14;40(2):185-200.e6.
- [5] Widyarman AS, Bachtiar BM, Bahctiar EW. Reuterin isolated from *Lactobacillus reuteri* Indonesian strain affected interleukin-8 and human beta defensin-2 on pathogens induced-HaCat cells. *Trop Life Sci Res*. 2022;33(2):75-90.
- [6] Fernández-Cruz ML, Martín-Cabrejas I, Pérez-del Palacio J, et al. In vitro toxicity of reuterin, a potential food biopreservative. *Food Chem Toxicol*. 2016;96:155-159.
- [7] Cui L, Xu X, Fan H, et al. Reuterin promotes pyroptosis in hepatocellular cancer cells through mtDNA-mediated STING activation and caspase 8 expression. *Cancer Lett*. 2024;601:217183.
- [8] Wang Y, Zhou D, Chen Q, et al. Reuterin alleviates Enterohemorrhagic *Escherichia coli* O157:H7-induced infectious diarrhea in mice through modulation of the gut microbiota. *World J Microbiol Biotechnol*. 2026;42:555.
- [9] Wei J, Xu F, He Z, et al. Reuterin drives osteogenic and suppresses adipogenic differentiation of bone marrow mesenchymal stem cells via BMP/SMAD signaling to ameliorate osteoporosis. *Tissue Cell*. 2027;104:103791.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA