Quinine

Cat. No.: HY-D0143

CAS No.: 130-95-0

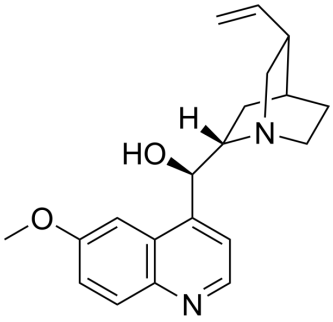
Molecular Formula: $C_{20}H_{24}N_2O_2$

Molecular Weight: 324.42

Target: Potassium Channel; Parasite; Flavivirus; Dengue virus

Pathway: Membrane Transporter/Ion Channel; Anti-infection

Storage: 4°C, protect from light, stored under nitrogen
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light, stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (308.24 mM)
H_2O : < 0.1 mg/mL (insoluble)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.0824 mL	15.4121 mL	30.8242 mL
5 mM	0.6165 mL	3.0824 mL	6.1648 mL
10 mM	0.3082 mL	1.5412 mL	3.0824 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (7.71 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (7.71 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.71 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Quinine is an alkaloid derived from the bark of the cinchona tree, acts as an anti-malaria agent. Quinine is a potassium channel inhibitor that inhibits WT mouse Slo3 ($K_{Ca}5.1$) channel currents evoked by voltage pulses to +100 mV with an IC_{50} of 169 μM[1][2].

IC_{50} & Target

Plasmodium

In Vitro

Quinine (150 μM, 30 min) inhibits the proliferation and cytostatic effects of DENV (Dengue virus) in human hepatocarcinoma HepG2 cell line[1].
Quinine (37.5-150 μM, 24 hours) significantly reduces viral DENV RNA and protein levels in a dose-dependent manner in human hepatocarcinoma HepG2 cell line[1].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Proliferation Assay[1]

Cell Line:	Human hepatocarcinoma cell line (HepG2)
Concentration:	150 μM
Incubation Time:	30 min
Result:	Inhibited DENV virus replication with 19% yield compared to untreated. Reduced DENV-positive cells from 23.28% to 12.05% in a dose-dependent manner.

In Vivo

Quinine (oral gavage, 12 or 15 mg/kg, every week, 16 weeks) has some tumor suppressing effect on skin cancer in Swiss albino mice[2].
Quinine (oral gavage, 10 mg/kg, everyday, 8 weeks) causes a decrease in the antioxidant defense system of rat testicular tissue such as SOD, CAT and GSH enzyme activity in male adult albino rats[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Swiss albino mice 7-8-weeks (weighing 24 g)[2]
Dosage:	12 mg/kg, 15 mg/kg
Administration:	Oral gavage; every week; 16 weeks
Result:	Resulted in a significant reduction in tumor size and weight at 12 mg/kg and little effect at higher dose of 15 mg/kg.

CUSTOMER VALIDATION

- ACS Omega. 2024 Feb 28;9(10):11870-11882.
- Mol Med Rep. 2021 Mar 2.
- Norwegian University of Science and Technology, Faculty of Medicine and Health sciences. 2019 Sep.

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REFERENCES

[1]. Shilu Malakar et al. Drug repurposing of quinine as antiviral against dengue virus infection. Virus Res. 2018 Aug 15;255:171-178. doi: 10.1016/j.virusres.2018.07.018. Epub 2018 Jul 25.

[2]. Jhanwar, Deepika et al. Chemoprevention of DMBA induced skin carcinogenesis in swiss albino mice by quinine sulfate.(2016): 2636-2640.

[3]. Ebenezer O Farombi, et al. Quercetin protects against testicular toxicity induced by chronic administration of therapeutic dose of quinine sulfate in rats. J Basic Clin Physiol Pharmacol. 2012 Feb 27;23(1):39-44.

[4]. Wrighton DC, et al. Mechanism of inhibition of mouse Slo3 (KCa 5.1) potassium channels by quinine, quinidine and barium. Br J Pharmacol. 2015 Sep;172(17):4355-63.

[5]. Jane Achan , et al. Quinine, an Old Anti-Malarial Drug in a Modern World: Role in the Treatment of Malaria. Malar J. 2011 May 24;10:144.

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