Tetrandrine

Cat. No.: HY-13764

CAS No.: 518-34-3

Molecular Formula: $C_{38}H_{42}N_2O_6$

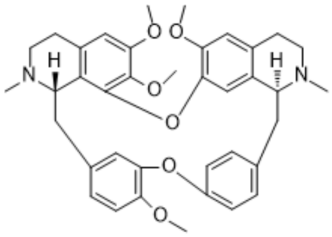
Molecular Weight: 622.75

Target: Calcium Channel; Potassium Channel; Parasite

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling; Anti-infection

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 5 mg/mL (8.03 mM; Need ultrasonic and warming)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.6058 mL	8.0289 mL	16.0578 mL
	5 mM	0.3212 mL	1.6058 mL	3.2116 mL
	10 mM	---	---	---

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

In Vivo

1. Add each solvent one by one: 50% PEG300 >> 50% saline
   Solubility: 10 mg/mL (16.06 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 0.5 mg/mL (0.80 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 0.5 mg/mL (0.80 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 0.5 mg/mL (0.80 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Tetrandrine (NSC-77037; d-Tetrandrine) is a bis-benzyl-isoquinoline alkaloid, which inhibits voltage-gated Ca^{2+} current (ICa) and Ca^{2+}-activated K^+ current.

IC_{50} & Target

Ca^{2+} current[1]
K^+ current[1]

In Vitro	The effects of Tetrandrine (NSC-77037), a bis-benzyl-isoquinoline alkaloid, on voltage-gated Ca^{2+} currents (ICa) and on Ca^{2+}-activated K^+ current (IK(Ca)) and channels in isolated nerve terminals of the rat neurohypophysis are investigated using patch-clamp techniques. The non-inactivating component of ICa is inhibited by external Tetrandrine (NSC-77037) in a voltage- and dose-dependent manner, with an IC_{50}=10.1μM. Tetrandrine (NSC-77037) decreases the channel-open probability, within bursts, with an IC_{50}=0.21 μM[1]. To evaluate the effects of Tetrandrine on HCC cells, Huh7, HCCLM9 and Hep3B cells are treated with 0 (DMSO), 0.5, 1, 2 or 4 μM of Tetrandrine for 24 h. The cell proliferation assay indicates that Tetrandrine exhibits almost no effect on the inhibition of HCC cell proliferation at 0.5-2 μM. However, Tetrandrine (NSC-77037) inhibits HCC cell migration in a dose-dependent manner. Furthermore, a wound-healing and transwell assay shows that 2 μM Tetrandrine significantly inhibits HCC cell migration and invasion[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	To evaluate the effect of Tetrandrine (NSC-77037) on the inhibition of tumor metastasis in vivo, HCCLM9 subcutaneous tumor xenograft models is established with athymic nude mice. When the tumor volume reach approximately 50 mm^3, nude mice are orally administered vehicle or Tetrandrine (NSC-77037) (30 mg/kg) every other day for 37 days. Tetrandrine (NSC-77037) treatment inhibits tumor growth by reducing the tumor volume and weight[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Huh7, HCCLM9 and Hep3B cells are seeded in a 96-well plate at a cell density of 5 × 10^3 cells/well. The cells are treated with the indicated concentrations (0-4 μM) of Tetrandrine (NSC-77037) for 24 h. The cells are subsequently stained with 20 μL of MTS for 1-2 h, and the plates are read at 490 nm on a BioTek ELx800[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Mice[2] Four-week-old male athymic BALB/c nu/nu SPF mice (body weight range from 18 g to 20 g) are used. HCCLM9 WT and HCCLM9 ATG7 KO cells (5 million) resuspended in 0.2 mL of PBS are subcutaneously implanted into the right flank of each mouse. When the tumor volume reach approximately 50 mm^3, the tumor-bearing mice are randomly divided into control and treatment groups (n = 6). The control and treatment groups are administered oral injection of vehicle (0.5% methylcellulose) and Tetrandrine at 30 mg/kg of body weight every other day for 37 days. During the treatment, the tumor volumes are measured every day and are calculated. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Commun. 2023 Jan 14;14(1):226.
- Pharmacol Res. 2023 Oct 14:197:106955.
- Front Pharmacol. 2020 Jan 10;10:1530.
- Heliyon. 13 August 2022, e10201.
- Virology. 27 May 2022.

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REFERENCES

[1]. Wang G, et al. Tetrandrine blocks a slow, large-conductance, Ca(2+)-activated potassium channel besides inhibiting a non-inactivating Ca2+ current in isolated nerve terminals of the rat neurohypophysis. Pflugers Arch. 1992 Sep;421(6):558-65.

[2]. Zhang Z, et al. The plant alkaloid tetrandrine inhibits metastasis via autophagy-dependent Wnt/β-catenin and metastatic tumor antigen 1 signaling in human liver cancer cells. J Exp Clin Cancer Res. 2018 Jan 15;37(1):7.

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