Tanshinone IIA

Cat. No.: HY-N0135

CAS No.: 568-72-9

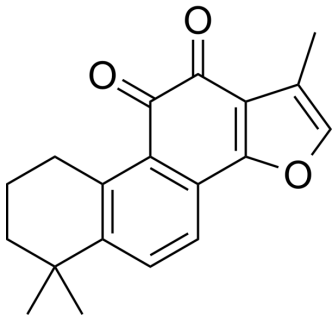
Molecular Formula: $C_{19}H_{18}O_3$

Molecular Weight: 294.34

Target: VEGFR

Pathway: Protein Tyrosine Kinase/RTK

Storage: Powder -20°C 3 years
4°C 2 years
* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

DMSO : 1 mg/mL (3.40 mM; ultrasonic and warming and heat to 80°C)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	3.3974 mL	16.9872 mL	33.9743 mL
	5 mM	---	---	---
	10 mM	---	---	---

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

BIOLOGICAL ACTIVITY

Description

Tanshinone IIA (Tan IIA) is one of the main compositions in the root of Salvia miltiorrhiza Bunge. Tanshinone IIA may suppress angiogenesis by targeting the protein kinase domains of VEGF/VEGFR2.

IC_{50} & Target

VEGF/VEGFR2[1]

In Vitro

The anti-tumor effect of Tanshinone IIA includes inhibiting tumor cell proliferation, disturbing tumor cell cycle, promoting tumor cell apoptosis, and inhibiting tumor cell invasion and transfer. Tanshinone IIA has anti-proliferative effects on A549 cells: the IC_{50} of Tanshinone IIA after 24, 48 and 72 h are 145.3, 30.95 and 11.49 μM, respectively. The CCK-8 assay is used to evaluate the proliferative activity of A549 cells treated with Tanshinone IIA (2.5-80 μM) for 24, 48 and 72 h, respectively. The CCK-8 results show that Tanshinone IIA can significantly inhibit A549 cell proliferation in a dose- and time-dependent manner. Obvious apoptosis and cell growth inhibition of A549 cells are observed after drug treatment for 48 h (concentrations used are approximately IC_{50} values: Tanshinone IIA 31 μM on A549). Western blotting finds that 48 h exposures to Tanshinone IIA (31 μM) in A549 cells, downregulates expression of VEGF and VEGFR2 protein in both drug treatment groups vs. vehicle[1]. Tanshinone IIA, one of the most abundant constituents of the root of Salvia miltiorrhiza, protects rat myocardium-derived H9C2 cells against apoptosis. Treatment of H9C2 cells with Tanshinone IIA inhibits angiotensin II-induced apoptosis by downregulating the expression of PTEN (phosphatase and tensin homolog), a tumor

suppressor that plays a critical role in apoptosis. Tanshinone IIA inhibits angiotensin II (AngII)-induced apoptosis by downregulating the expression of phosphatase and tensin homolog (PTEN)[2]. Tanshinone IIA decreases the protein expression of EGFR, and IGFR blocking the PI3K/Akt/mTOR pathway in gastric carcinoma AGS cells[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Tanshinone IIA (10 or 20 mg/kg; p.o) significantly reverses scopolamine-induced cognitive impairments[4].
Tanshinone IIA (2, 4, 8 mg/kg; i.p.) mediated protective effects on the STZ-induced diabetic nephropathy may be associates with the reduced endoplasmic reticulum stress via attenuating PERK signaling activities[5].
Tanshinone IIA (3 and 12 mg/kg; i.p.) significantly inhibits the growth of ectopic endometrium[6].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male ICR mice (25–30 g)[4]
Dosage:	10 or 20 mg/kg
Administration:	P.o.
Result:	Significantly reversed scopolamine-induced cognitive impairments.

Animal Model:	STZ-treated rats[5]
Dosage:	2, 4, 8 mg/kg
Administration:	I.p.
Result:	Decreased the expression levels of transforming growth factor-beta1, TSP-1, Grp78 and CHOP and attenuated the increase in the protein levels of p-PERK, p-elf2α and ATF-4 from the renal tissues of diabetic rats.

Animal Model:	Female Sprague-Dawley rats (180 -200g)[6]
Dosage:	3 and 12 mg/kg
Administration:	I.p.
Result:	Significantly inhibited the growth of ectopic endometrium.

CUSTOMER VALIDATION

- J Transl Med. 2023 Jan 20;21(1):34.
- Phytother Res. 2022 Jul 8.
- Cancer Cell Int. 2020 Aug 7;20:379.
- Chem-Biol Interact. 2020 Mar 1;319:109024.
- Eur J Pharmacol. 2020 Aug 5;880:173140.

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REFERENCES

[1]. Xie J, et al. The antitumor effect of tanshinone IIA on anti-proliferation and decreasing VEGF/VEGFR2 expression on the human non-small cell lung cancer A549 cell line. Acta Pharm Sin B. 2015 Nov;5(6):554-63.

[2]. Zhang Z, et al. Tanshinone IIA inhibits apoptosis in the myocardium by inducing microRNA-152-3p expression and thereby downregulating PTEN. Am J Transl Res. 2016 Jul 15;8(7):3124-32.

[3]. Su CC, et al. Tanshinone IIA decreases the protein expression of EGFR, and IGFR blocking the PI3K/Akt/mTOR pathway in gastric carcinoma AGS cells both in vitro and in vivo. Oncol Rep. 2016 Aug;36(2):1173-9.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA