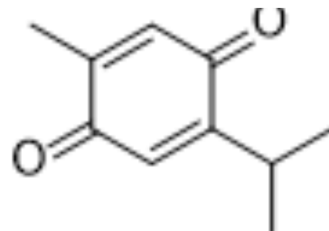


## Thymoquinone

Cat. No.:	HY-D0803
CAS No.:	490-91-5
Molecular Formula:	C <sub>10</sub> H <sub>12</sub> O <sub>2</sub>
Molecular Weight:	164.2
Target:	VEGFR; Apoptosis; PI3K; Akt
Pathway:	Protein Tyrosine Kinase/RTK; Apoptosis; PI3K/Akt/mTOR
Storage:	4°C, protect from light * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : ≥ 100 mg/mL (609.01 mM)  
 H<sub>2</sub>O : < 0.1 mg/mL (insoluble)  
 \* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	6.0901 mL	30.4507 mL	60.9013 mL
	5 mM	1.2180 mL	6.0901 mL	12.1803 mL
	10 mM	0.6090 mL	3.0451 mL	6.0901 mL

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

#### In Vivo

- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 2.5 mg/mL (15.23 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.5 mg/mL (15.23 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.5 mg/mL (15.23 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Thymoquinone is an orally active natural product isolated from *N. sativa*. Thymoquinone down-regulates the VEGFR2-PI3K-Akt pathway. Thymoquinone has antioxidant, anti-inflammatory, anticancer, antiviral, anticonvulsant, antifungal, antiviral, antiangiogenic activity and hepatoprotective effects. Thymoquinone can be used to study Alzheimer's disease, cancer, cardiovascular disease, infectious disease and inflammation <sup>[1][2][3][4][5]</sup>.

#### IC<sub>50</sub> & Target

VEGFR2	PI3K	Akt
--------	------	-----

## In Vitro

Thymoquinone (20-100  $\mu$ M, 24-72 h) has anti-proliferation and pro-apoptotic activity in non-small cell lung cancer SCLC cell lines, and has a synergistic effect with Cisplatin (CDDP) (HY-17394) [3].

Thymoquinone (100 nM, 24 h) inhibits VEGF expression in HUVECs cells through the VEGFR2/PI3K/Akt signaling pathway[5].

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

Cell Proliferation Assay[3]

Cell Line:	SCLC cell line NCI-H146
Concentration:	20-100 $\mu$ M
Incubation Time:	24-72 h
Result:	Thymoquinone of 80 and 100 $\mu$ M showed significant inhibition of cell proliferation, most pronounced at 24 hours. The effect of Thymoquinone alone on cell proliferation diminished over time.

## In Vivo

Thymoquinone (5-20 mg/kg/day for 3 days, i.p.) can play a protective role against hepatotoxicity induced by paraquat by activating SOD inhibition mediated by paraquat[1].

Thymoquinone (10 mg/kg/day for 5 days, p.o.) can protect against Doxorubicin (HY-15142A)-induced cardiotoxicity in rats through superoxide clearance and anti-lipid peroxidation[2].

Thymoquinone (5-20 mg/kg subcutaneously (s.c.) on Monday, Wednesday and Friday for 3 weeks) alone can effectively reduce the tumor volume of NCI-H460 mouse xenograft model, overcome Cisplatin (CDDP) (HY-17394) resistance, and improve its efficacy [3].

Thymoquinone (10 or 20 mg/kg/day for 15 days, i.g.) could clear A $\beta$  plaques and restore neuronal vitality, which could improve the memory ability of A $\beta$ 1-42 perfusion rats[4].

Thymoquinone (single 3 mg/kg, i.p.) down-regulates the VEGFR2-PI3K-Akt pathway and inhibits inflammation and new angiogenesis in asthmatic mice[5].

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

Animal Model:	Male albino mice (22-27g), Paraquat-induced hepatotoxicity in mice[1]
Dosage:	5-20 mg/kg/day for 3days
Administration:	i.p.
Result:	Significantly reduced the level of LPO and restored the endogenous antioxidant capacity of liver tissue. Restored SOD activity inhibited by Paraquat. Thymoquinone's optimum, safe, and protective dose against Paraquat-hepatotoxicity is about 10 mg/kg, which is comparable to the antioxidant properties of Vitamin E.

## CUSTOMER VALIDATION

- Int J Biol Sci. 2021 Aug 12;17(13):3456-3475.
- Biofactors. 2023 Mar 16.
- Molecules. 2023 May 15, 28(10), 4096.
- Heliyon. 2024 Jan 17.
- Genes (Basel). 2023 Aug 30, 14(9), 1730.

See more customer validations on [www.MedChemExpress.com](http://www.MedChemExpress.com)

---

## REFERENCES

- [1]. Zeinvand-Lorestani H, et al. Protective role of thymoquinone against paraquat-induced hepatotoxicity in mice. *Pestic Biochem Physiol.* 2018 Jun;148:16-21.
- [2]. Nagi MN, et al. Protective effect of thymoquinone against doxorubicin-induced cardiotoxicity in rats: a possible mechanism of protection. *Pharmacol Res.* 2000 Mar;41(3):283-9.
- [3]. Jafri SH, et al. Thymoquinone and cisplatin as a therapeutic combination in lung cancer: In vitro and in vivo. *J Exp Clin Cancer Res.* 2010 Jul 1;29(1):87.
- [4]. Elibol B, et al. Thymoquinone administration ameliorates Alzheimer's disease-like phenotype by promoting cell survival in the hippocampus of amyloid beta1-42 infused rat model. *Phytomedicine.* 2020 Dec;79:153324.
- [5]. Su X, et al. Thymoquinone inhibits inflammation, neoangiogenesis and vascular remodeling in asthma mice. *Int Immunopharmacol.* 2016 Sep;38:70-80.
- 

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: [tech@MedChemExpress.com](mailto:tech@MedChemExpress.com)

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