Idebenone

Cat. No.: HY-N0303

CAS No.: 58186-27-9

Molecular Formula: $C_{19}H_{30}O_5$

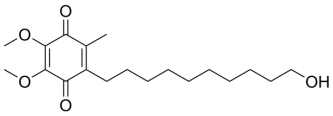
Molecular Weight: 338.44

Target: Apoptosis; Mitochondrial Metabolism

Pathway: Apoptosis; Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	1 year
	-20°C	6 months



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (295.47 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.9547 mL	14.7737 mL	29.5473 mL
5 mM	0.5909 mL	2.9547 mL	5.9095 mL
10 mM	0.2955 mL	1.4774 mL	2.9547 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 (7.39 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (7.39 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.39 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Idebenone, a well-appreciated mitochondrial protectant, exhibits protective efficacy against neurotoxicity and can be used for the research of Alzheimer's disease, Huntington's disease. Idebenone (oxidised form) has a dose-dependent inhibitory effect on the enzymatic metabolism of arachidonic acid in astroglial homogenates (IC_{50}=16.65 μM)[1]. Idebenone, a coenzyme Q10 analog and an antioxidant, induces apoptotic cell death in the human dopaminergic neuroblastoma SHSY-5Y cells[2]. Idebenone quickly crosses the blood-brain barrier.

In Vitro

Idebenone, a compound with protective efficacy against neurotoxicity both in in vitro and in in vivo models, exists in two different oxidative states: the ubiquinol-derivative (reduced idebenone) and the ubiquinone-derivative (oxidised idebenone)[1].

Idebenone (oxidised form) preferentially inhibits cyclooxygenase vs. lipoxygenase metabolism (IC_{50} ratio lipoxygenase/cyclooxygenase: 3.22)[1].
Idebenone (oxidised form) behaves similarly as indomethacin and piroxicam—two typical anti-inflammatory agents[1].
Idebenone (oxidised form) inhibits total arachidonic acid metabolism, cyclooxygenase metabolism, lipoxygenase metabolism, lipoxygenase/cyclooxygenase with IC_{50}s of 16.65±3.48, 14.44±2.99, 46.51±7.20, and 3.22 μM[1].
Idebenone (1-10 μM; for 24-72 h) has no effect on the cell viability of SHSY-5Y cells[2].
Idebenone (25 μM or higher concentrations; for 24-72 h) shows significant reduction in cell viability of SHSY-5Y cells[2].
Idebenone (30 μM) induces up-regulation of BAX expression and the caspase-3 activity[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

Cell Line:	The human dopaminergic neuroblastma cell line, SHSY-5Y cells
Concentration:	1, 3, 10, 15, 25, 30, and 90 μM
Incubation Time:	24, 48, and 72 hours
Result:	Had no apparent detrimental effects on cell viability as indicated by the absence of trypan blue-positive staining in the cells at concentrations of 1, 3, 10 μM. Exhibited some degree of trypan blue-positive staining at 15 μM. Showed extensive trypan blue-positive staining at 25 μM and 30 μM.

RT-PCR[2]

Cell Line:	SHSY-5Y cells
Concentration:	10 μM, 30 μM
Incubation Time:	72 hours
Result:	The total RNA of BAX from SHSY-5Y cells exposed to 10 μM was not different from that of the untreated control cells. The BAX expression in SHSY-5Y cells exposed to 30 μM was significantly up-regulated when compared with the untreated control cells and cells exposed to 10 μM.

In Vivo

Idebenone (oxidised form) is a compound with protective efficacy against cerebrovascular disorders in vivo, including cerebral ischemia and hypertension-induced vascular lesions[1].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Mater Design. 2024 Apr 25:112972
- Neuropsych Dis Treat. 2021 Feb 17;17:533-543.
- Oncotarget. 2018 Jan 30;9(15):12137-12153.

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REFERENCES

[1]. G Civenni, et al. Inhibitory effect of the neuroprotective agent idebenone on arachidonic acid metabolism in astrocytes.Eur J Pharmacol. 1999 Apr 9;370(2):161-7.

[2]. Kwok-Keung Tai, et al. Idebenone induces apoptotic cell death in the human dopaminergic neuroblastoma SHSY-5Y cells. Neurotox Res. 2011 Nov;20(4):321-8.

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