Q-VD-OPh

Cat. No.: HY-12305

CAS No.: 1135695-98-5

Molecular Formula: $C_{26}H_{25}F_2N_3O_6$

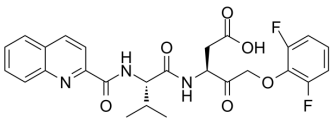
Molecular Weight: 513.49

Target: Caspase; HIV

Pathway: Apoptosis; Anti-infection

Storage:

Powder	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (194.75 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.9475 mL	9.7373 mL	19.4746 mL
	5 mM	0.3895 mL	1.9475 mL	3.8949 mL
	10 mM	0.1947 mL	0.9737 mL	1.9475 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: ≥ 2.08 mg/mL (4.05 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.05 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.05 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Q-VD-OPh is an irreversible pan-caspase inhibitor with potent antiapoptotic properties; inhibits caspase 7 with an IC_{50} of 48 nM and 25-400 nM for other caspases including caspase 1, 3, 8, 9, 10, and 12. Q-VD-OPh can inhibits HIV infection. Q-VD-OPh is able to cross the blood-brain barrier.

IC_{50} & Target

Caspase-7 48 nM (IC_{50})	Caspase-3 25-400 nM (IC_{50})	Caspase-1 25-400 nM (IC_{50})	Caspase-8 25-400 nM (IC_{50})
Caspase-9 25-400 nM (IC_{50})	Caspase-10 25-400 nM (IC_{50})	Caspase-12 25-400 nM (IC_{50})	

In Vitro	Q-VD-OPh is a potent inhibitor of caspase-7 with an IC_{50} of 48 nM utilizing a cell-free assay consisting of human recombinant caspase-7, Q-VD-OPh, and the substrate AMC-DEVD-pNa[1]. Q-VD-OPh fully inhibits caspase-3 and -7 activity at 0.05 μM. Caspase-8 is also inhibited at low Q-VD-OPh concentrations. The cleavage of PARP-1 is fully prevented at 10 μM Q-VD-OPh. DNA fragmentation and disruption of the cell membrane functionality are both prevented at 2 μM Q-VD-OPh[2]. Q-VD-OPh is significantly more effective in preventing apoptosis than the widely used inhibitors, ZVAD-fmk and Boc-D-fmk, and is also equally effective in preventing apoptosis mediated by the three major apoptotic pathways, caspase 9/3, caspase 8/10, and caspase12. Q-VD-OPh is not toxic to cells even at extremely high concentrations[3]. QVD is also able to increase the expression of differentiation markers in acute myeloid leukemia (AmL) blasts. QVD alone or combined with VDDs increases differentiation and HPK1-cJun signaling in AmL cell context-dependent manner[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Chronic treatment with Q-VD-OPh prevents caspase-7 activation and limits the pathological changes associated with tau, including caspase cleavage. Q-VD-OPh could be a potential therapeutic compound for the treatment of Alzheimer's disease [1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [1]	Mouse: Stock solutions of Q-VD-OPh are prepared in DMSO and diluted in sterile PBS solution prior to injection. A final concentration of 10 mg/kg is chosen indicating neuroprotection at this concentration of Q-VD-OPh. Three-month old mice are divided into two groups: control, vehicle (n=3) or treated (n=2). Mice are injected i.p. three times a week with either Q-VD-OPh or vehicle for a total time period of 3 months[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nature. 2023 Mar;615(7950):158-167.
- Cell Mol Immunol. 2021 May;18(5):1186-1196.
- Adv Sci (Weinh). 2023 Jul 19;e2207108.
- Sci Adv. 2024 Mar;10(9):eadk0820.
- Cell Death Differ. 2024 Apr 6.

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REFERENCES

[1]. Rohn TT, et al. Caspase activation in transgenic mice with Alzheimer-like pathology: results from a pilot study utilizing the caspase inhibitor, Q-VD-OPh. Int J Clin Exp Med. 2009 Nov 5;2(4):300-8.

[2]. Kuzelová K, et al. Dose-dependent effects of the caspase inhibitor Q-VD-OPh on different apoptosis-related processes. J Cell Biochem. 2011 Nov;112(11):3334-42.

[3]. Caserta TM, et al. Q-VD-OPh, a broad spectrum caspase inhibitor with potent antiapoptotic properties. Apoptosis. 2003 Aug;8(4):345-52.

[4]. Chen-Deutsch X, et al. Leuk Res. 2012 Jul;36(7):884-8. The pan-caspase inhibitor Q-VD-OPh has anti-leukemia effects and can interact with vitamin D analogs to increase HPK1 signaling in AML cells.

[5]. Laforge M, et al. The anti-caspase inhibitor Q-VD-OPH prevents AIDS disease progression in SIV-infected rhesus macaques. J Clin Invest. 2018 Apr 2;128(4):1627-1640.

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

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