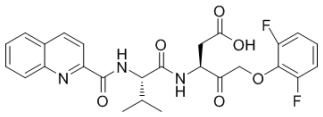
Q-VD-OPh

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
Pathway:	Apoptosis
Storage:	Powder -20°C 3 years In solvent -80°C 6 months -20°C 1 month



Solvent & Solubility

In Vitro

DMSO : ≥ 25 mg/mL (48.69 mM)

* "≥" means soluble, but saturation unknown.

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 >> 90% (20% SBE-β-CD in saline)**
   Solubility: ≥ 2.08 mg/mL (4.05 mM); Clear solution
2. 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
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-OPha is an irreversible **pan-caspase** inhibitor with potent antiapoptotic properties; inhibits caspase 7 with **IC_{50}** of 48 nM and 25-400 nM for other caspases including caspase 1, 3, 8, 9, 10, and 12. Q-VD-OPha 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].		
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].		

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

- **Cell Physiol Biochem**. 2017 Jul 27;42(5):1822-1836.
- **J Cell Sci**. 2019 Feb 28;132(5).

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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.

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

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