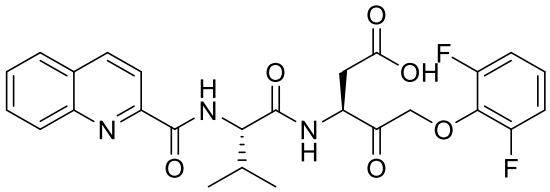
Product data sheet

MedKoo Cat#: 526845 Name: QVD-OPH CAS#: 1135695-98-5 Chemical Formula: $C_{26}H_{25}F_2N_3O_6$ Exact Mass: 513.1711 Molecular Weight: 513.6	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
QVD-OPH, also known as Quinoline-Val-Asp-Difluorophenoxymethylketone, is a broad spectrum caspase inhibitor with potent antiapoptotic properties. Q-VD-OPh prevents neonatal stroke in P7 rat: a role for gender. Q-VD-OPh has anti-leukemia effects and can interact with vitamin D analogs to increase HPK1 signaling in AML cells. Q-VD-OPh reduces trauma-induced apoptosis and improves the recovery of hind-limb function in rats after spinal cord injury.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	100	194.75
Ethanol	100	194.75

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	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
50 mM	0.0389 mL	0.1947 mL	0.3895 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Kuželová K, Grebeňová D, Brodská B. Dose-dependent effects of the caspase inhibitor Q-VD-OPh on different apoptosis-related processes. J Cell Biochem. 2011 Nov;112(11):3334-42. doi: 10.1002/jcb.23263. PMID: 21751237.

2. Chen-Deutsch X, Kutner A, Harrison JS, Studzinski GP. 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. Leuk Res. 2012 Jul;36(7):884-8. doi: 10.1016/j.leukres.2012.03.023. Epub 2012 Apr 26. PMID: 22541691; PMCID: PMC3361643.

In vivo study

1. Rohn TT, Kokoulina P, Eaton CR, Poon WW. 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. PMID: 20057974; PMCID: PMC2802048.

2. Melnikov VY, Faubel S, Siegmund B, Lucia MS, Ljubanovic D, Edelstein CL. Neutrophil-independent mechanisms of caspase-1- and IL-18-mediated ischemic acute tubular necrosis in mice. J Clin Invest. 2002 Oct;110(8):1083-91. doi: 10.1172/JCI15623. PMID: 12393844; PMCID: PMC150794.

7. Bioactivity

Biological target: Inhibits caspase 7 with an IC50 of 48 nM and 25-400 nM for other caspases including caspase 1, 3, 8, 9, 10, and 12.

In vitro activity

Simultaneous addition of Q-VD-OPh at <50 nM concentration was sufficient to fully inhibit caspase-3 and -7 activity which was assessed using the fluorogenic substrateAc-DEVD-AFC (Fig. 1). Anti-caspase-3 immunoblots (Fig. 3) showed that Q-VD-OPh binds to the large caspase-3 subunit andeven prevents the procaspase-3 processing. The active caspase-3 isproduced by proteolytic cleavage of the proenzyme (32 kDa) atAsp175 into the 12 kDa subunit and a 20 kDa fragment andsubsequent two-step autoprocessing of the latter fragment into themature 17 kDa subunit [Fernandes-Alnemri et al., 1996; Han et al.,1997]. The antibody we used detects an epitope within the 17 kDasubunit which contains the reactive cysteine. Covalent binding ofthe inhibitor Q-VD-OPh to the cysteine results in a very slight shift (about 0.3 kDa) of the detected band to the higher MW. As shown inFigure 3, Q-VD-OPh also prevents the autoprocessing of the 20 and18.5 kDa fragments into the 17 kDa subunit. Moreover, at 10 mMconcentration, Q-VD-OPh inhibits the protease responsible for theinitial procaspase3 cleavage (possibly one of the initiator caspases orgranzyme B).

Reference: J Cell Biochem. 2011 Nov;112(11):3334-42. https://onlinelibrary.wiley.com/doi/abs/10.1002/jcb.23263

In vivo activity

Analysis of 12 month-old TgCRND8 mice, which represent an early-onset animal model for AD, indicated the activation of caspase-7 as well as the cleavage of tau and the amyloid precursor protein (APP). Having established that TgCRND8 mice represent a suitable model system to target caspases therapeutically, a prophylactic study was initiated utilizing Q-VD-OPh. Three month-old TgCRND8 mice were injected intraperitoneally three times a week for three months with 10 mg/kg Q-VD-OPh and compared to control mice injected with vehicle. Although there was no apparent effect on extracellular Abeta deposition, chronic treatment with Q-VD-OPh did prevent caspase-7 activation and limited the pathological changes associated with tau, including caspase cleavage. These preliminary findings suggest that further studies examining the utility of Q-VD-OPh as a potential therapeutic compound for the treatment of AD are warranted.

Reference: Int J Clin Exp Med. 2009 Nov 5;2(4):300-8. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2802048/

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.