Product Data Sheet

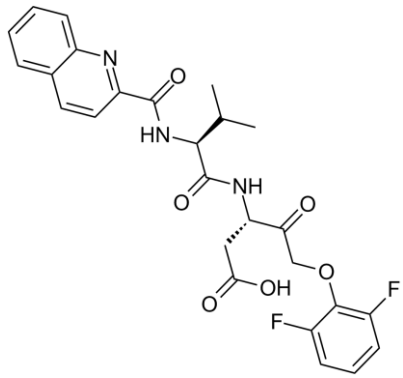
Chemical Properties

Product Name: Q-VD-OPh hydrate

Cas No.: 1135695-98-5

M.Wt: 513.49

Formula: C26H25F2N3O6.xH2O



Chemical Name: (3S)-5-(2,6-difluorophenoxy)-3-[[(2S)-3-methyl-2-(quinoline-2-carbonylamino)butanoyl]amino]-4-oxopentanoic acid

Canonical SMILES: CC(C)C(C(=O)NC(CC(=O)O)C(=O)COC1=C(C=CC=C1F)F)NC(=O)C2=NC3=CC=CC=C3C=C2

Solubility: >25.7mg/mL in DMSO

Storage: Store at -20°C

General tips: For obtaining a higher solubility , please warm the tube at 37° C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20° C for several months.

Shopping Condition: Evaluation sample solution : ship with blue ice
All other available size: ship with RT , or blue ice upon request

Biological Activity

Targets : Caspase

Pathways: Apoptosis >> Caspase

Description:

The broad spectrum caspase inhibitor, QVD-OPh, provides a cost effective, non toxic, and highly specific means of apoptotic inhibition and provides new insight into the design of new inhibitors1.
Actinomycin D rapidly induced apoptosis and this was dramatically inhibited by the caspase inhibitor, Q-VD-OPh (quinolyl-valyl-O-methylaspartyl-[-2, 6-difluorophenoxy]-methyl ketone).

Q-VD-OPh was significantly more effective in preventing apoptosis than the widely used inhibitors, ZVAD-fmk and Boc-D-fmk. Q-VD-OPh was also equally effective in preventing apoptosis mediated by the three major apoptotic pathways, caspase 9/3, caspase 8/10, and caspase 12. In addition to the increased effectiveness, Q-VD-OPh was not toxic to cells, even at high concentrations.
Q-VD-OPh was equally effective at inhibiting the three major apoptotic pathways, was functional in different cell types and species (human, mouse, and rat) and prevented terminal caspase activation, substrate cleavage, and DNA ladder formation associated with apoptosis. Q-VD-OPh can inhibit recombinant caspases 1, 3, 8, and 9 with IC50 values ranging from 25 to 400 nM2. The effectiveness of Q-VD-OPh as an apoptotic inhibitor is evidenced by the complete suppression of an apoptotic inducer capable of inducing substantial cell death in less than 4 hours.
Q-VD-OPh protected against the substantial apoptosis induced by actinomycin D. In addition, Q-VD-OPh alone exhibited little or no toxicity, even at extremely high concentrations.
The effective concentration of Q-VD-OPh may provide a unique reagent when trying to revive hard to propagate cell lines from liquid nitrogen. The addition of this inhibitor to thawed cells would give the cells adequate time to recover, even in the presence of standard DMSO concentrations (10%), from the stress of thawing and begin to proliferate in the absence of toxicity. Q-VD-OPh is stable in solution for several months and is effective in culture for at least 2.5 days. This would provide an ideal time frame for cell recovery; whereas, the subsequent decrease in effectiveness over time would be fortuitous in that the cells would return to standard culture conditions with minimal manipulation1.

***Reference**:*
1. T. M. Caserta, A. N. Smith, A. D. Gultice, M. A. Reedy and T. L. Brown, Q-VD-OPh, a broad spectrum caspase inhibitor with potent antiapoptotic properties, Apoptosis 2003; 8: 345–352
2. Yin XM. Signal transduction mediated by Bid, a pro-death Bcl-2 family proteins, connects the death receptor and mitochondria apoptosis pathways. Cell Res 2000; 10: 161–167

Protocol

Cell experiment:

Cell lines	JURL-MK1 and HL60 cell
Preparation method	The solubility of this compound in DMSO is >10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.
Reacting conditions	No specific suggestion
Applications	Q-VD-OPh largely inhibited caspase-3 and 7 activity at 0.05 mM. Caspase-8 was also inhibited by Q-VD-OPh at very low concentration. Q-VD-OPh prevented the cleavage of PARP-1 at 10 mM . Q-VD-OPh inhibited DNA fragmentation and disruption of the cell membrane functionality at 2 mM, and the drug-induced loss of cellular adhesivity to fibronectin need 10 mM Q-VD-OPh.

Animal experiment [3]:

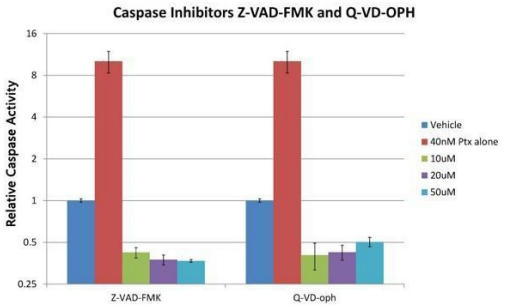
Animal models	TgCRND8 mice in 3 months-old
Dosage form	Intraperitoneally Injected with 10 mg/kg QVD-OPh at 3 times a week for 3 months
Applications	Q-VD-OPh inhibited caspase-7 activation and limited the pathological changes of tau and caspase cleavage in chronic treatment of Alzheimer disease.
Other notes	Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

***Reference**:*
1. Kuželová K1, 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.
2. Rohn TT, Kokoulina P, Eaton CR 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.

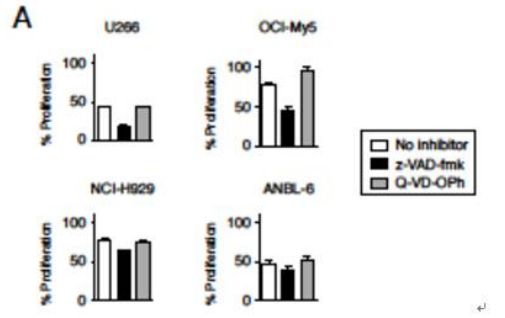
Product Citations

1.Tang, Zijian, et al. "MEK Guards Proteome Stability and Inhibits Tumor-Suppressive Amyloidogenesis via HSF1." Cell 160.4 (2015): 729-744. PMID:25679764
2.Lazarou, Michael, et al. "The ubiquitin kinase PINK1 recruits autophagy receptors to induce mitophagy." Nature (2015). PMID:26266977
3.Nezich, Catherine L., et al. "MiT/TFE transcription factors are activated during mitophagy downstream of Parkin and Atg5." The Journal of cell biology 210.3 (2015): 435-450. PMID:26240184
4.Nogusa S, Thapa RJ, et al. "RIPK3 Activates Parallel Pathways of MLKL-Driven Necroptosis and FADD-Mediated Apoptosis to Protect against Influenza A Virus." Cell Host Microbe. 2016 Jun 15. PMID:27321907
5.Vasuthasawat A, Yoo EM, et al. "Targeted immunotherapy using anti-CD138-interferon α fusion proteins and bortezomib results in synergistic protection against multiple myeloma." MAbs. 2016 Jun 30:0. PMID:27362935

Product Validation



Apoptosis was induced by Paclitaxel and the cells were then treated with Z-VAD-FMK and Q-VD-OPH at 0,10,20, and 50um. Caspase activities were measured by Promega Caspase-Glo assay were compared with vehicle control.



Induction of cell death is not prevented by caspase inhibition. Cells were treated with anti-CD138-IFNα14 and bortezomib in the presence or absence of pan-caspase inhibitors for 3 days. Cells were assessed for changes in metabolic activity by MTS. (A) 50 μM z-VAD-fmk or 20 μM Q-VD-OPh. MAbs. 2016 Jun 30:0.

Caution

FOR RESEARCH PURPOSES ONLY.

NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Shortterm storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.

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