Q-VD-OPH Inhibitor Peptide

Catalog No:	**NBP2-29386**
Content:	**Caspase Inhibitor: Q-Val-Asp(non-omethylated)-OPH** Also known as Q-VD (non-omethylated)-OPH. Molecular Weight: 513
Storage:	The caspase inhibitor is stable in the dessicator at room temperature for 1 year. However, we recommend storing dessicated at -20°C.
Form:	Off-white Semi Solid
Inhibitor Mechanism:	Q-VD-OPH is a cell permeable caspase peptide inhibitor. Caspase inhibitors irreversibly bind to the catalytic site of caspase proteases and inhibit apoptosis. Caspase inhibitors may be broad spectrum, inhibiting multiple caspases, or may preferentially inhibit particular caspases. Z-VAD-FMK (NBP2-29392), BOC-D-FMK (NBP2-29395), and Q-VD-OPH (NBP2-29391) are examples of broad spectrum or pan caspase inhibitors. In contrast Z-DEVD-FMK (NBP2-29396) preferentially inhibits caspases 3 and 7, Z-IETD-FMK (NBP2-29397) preferentially inhibits caspase 8, Z-LEHD-FMK (NBP2-29398) preferentiailly inhibits caspase 9. Z-FA-FMK (NBP2-29384) is considered to be a negative control for FMK based caspase inhibitors. Researchers are encouraged to consult the published literature for additional information about the mechanisms of caspase inhibition and how the various inhibitors are used to inhibit apoptosis.

Background

Members of the caspase family play key roles in apoptosis and inflammation. The "OPH" trap of Q-VD-OPH has superior potency, cell permeability, minimal toxicity, and provides an alternative to the fluoromethylketone (FMK) family of inhibitors. Like the FMK caspase inhibitors (reviewed in Thornberry and Lazebnik, 1998; Gregoli and Bondurant, 1999; Schrantz et al., 1999), Q-VD-OPH binds to the catalytic site of caspases proteases, and inhibits caspase-mediated apoptosis by preventing caspase activity. Users should consult the literature for additional information regarding applications for Q-VD-OPH (Caserta et al., 2003; Melnikov et al, 2002; Patil and Sharma, 2004).

Solubility

Make a stock solution of 10 mM in high purity DMSO (>99.9%). Add 195 uL DMSO to 1 mg of the pan caspase inhibitor (Q-VD-OPH peptide) to make a 10 mM stock solution. The stock solution is stable at -20°C for 6-8 months. Avoid repeated freeze/thaw cycles of the stock solution. For multiple uses, we suggest aliquoting the caspase inhibitor stock solution prior to freezing. Bring the solution to room temperature before opening the vial cap.

Usage:

Product Handling Protocol

Q-VD-OPH is a novel, irreversible, pan caspase inhibitor specifically designed for in vivo and in vitro research. Q-VD-OPH is widely cited in the literature, and researchers should refer to the literature for additional information about the various species that Q-VD-OPH has been used for.

For in vitro applications, Q-VD-OPH is typically used at final working concentration of 10-100 uM. The variability depends on model system, including cell type, culture, properties, and type of apoptosis induction treatments. Each researcher should empirically establish optimal working concentrations for their in vitro model system.

For in vivo applications, the recommended dose of Q-VD-OPh is 20 mg/kg. The caspase inhibitor is administered IP in 80-100% DMSO. Doses of up to 120 mg/kg have been used in mice without toxic effects (Melnikov and Vyacheslav, 2002; Patil and Sharma, 2004). Each researcher should empirically establish optimal doses for their animal model system.

Quality Control

- Mass Spec: M+1=514.1
- Chromatography: TLC:Rf: 0.4 Single Spot, EtOAC:6, ACOH:0.1
- H NMR: All functional groups are present

Reference:

1. Function of caspases in regulating apoptosis caused by erythropoietin deprivation in erythroid progenitors. Gregoli PA, MC Bondurant. *J of Clin Physiol* 178:133-143 (1999).
2. Caspases: enemies within. Thornberry NA, Y Lazebnik. *Science* 281:1312-1316.
3. Role of caspases and possible involvement of retinoblastoma protein during TGFbeta-mediated apoptosis of human B lymphocytes. Schrantz N, Blanchard DA, Auffredou MT, Sharma S, Leca G, Vazquez A. *Oncogene* 18:3511-3519.