

# Certificate of Analysis

[www.tocris.com](http://www.tocris.com)

**Product Name:** Z-VAD-FMK  
**CAS Number:** 634911-81-2  
**IUPAC Name:** Benzyloxycarbonyl-Val-Ala-Asp(OMe)-fluoromethylketone

**Catalog No.:** 2163 **Batch No.:** 28

## 1. PHYSICAL AND CHEMICAL PROPERTIES

**Batch Molecular Formula:** C<sub>22</sub>H<sub>30</sub>FN<sub>3</sub>O<sub>7</sub>  
**Batch Molecular Weight:** 467.49  
**Physical Appearance:** White lyophilised solid  
**Counter Ion:** Trifluoroacetate  
**Solubility:** Soluble to 9.35 mg/ml in DMSO  
**Storage:** Store at -20°C  
**Peptide Sequence:** Z-Val-Ala-DL-Asp(OMe)-FMK

## 2. ANALYTICAL DATA

**HPLC:** Shows 96.7% purity  
**Mass Spectrum:** Consistent with structure

## 3. AMINO ACID ANALYSIS DATA

Amino Acid Theoretical		Actual	Amino Acid Theoretical		Actual
Ala	1.00	1.00	Lys		
Arg			Met		
Asx			Phe		
Cys			Pro		
Glx			Ser		
Gly			Thr		
His			Trp		
Ile			Tyr		
Leu			Val	1.00	1.00

Caution - Not Fully Tested • Research Use Only • Not For Human or Veterinary Use

**bio-techne.com**  
info@bio-techne.com  
techsupport@bio-techne.com

**North America**  
Tel: (800) 343 7475

**China**  
info.cn@bio-techne.com  
Tel: +86 (21) 52380373

**Europe Middle East Africa**  
Tel: +44 (0)1235 529449

**Rest of World**  
[www.tocris.com/distributors](http://www.tocris.com/distributors)  
Tel: +1 612 379 2956

**Product Name:** Z-VAD-FMK

**Catalog No.:** 2163

**Batch No.:** 28

CAS Number: 634911-81-2

IUPAC Name: Benzyloxycarbonyl-Val-Ala-Asp(OMe)-fluoromethylketone

**Description:**

Z-VAD-FMK is a cell-permeable, irreversible pan-caspase inhibitor. Inhibits caspase processing and apoptosis induction in tumor cells in vitro ( $IC_{50}$  = 0.0015 - 5.8 mM). Active in vivo.

**Physical and Chemical Properties:**

Batch Molecular Formula:  $C_{22}H_{30}FN_3O_7$

Batch Molecular Weight: 467.49

Physical Appearance: White lyophilised solid

**Peptide Sequence:**

Z-Val-Ala-DL-Asp(OMe)-FMK

**Storage:** Store at -20°C

**Solubility & Usage Info:**

Soluble to 9.35 mg/ml in DMSO

This product is supplied in lyophilized form. It may appear as a solid, gel or film and be very hard to visualize. Solutions should be made by adding solvent directly to the vial. The vial should then be vortexed vigorously to ensure the product has completely dissolved.

**Counter Ion:** Trifluoroacetate

**Stability and Solubility Advice:**

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Peptides in solution are much less stable than in lyophilized form. This is especially true for peptides whose sequences contain amino acids such as Cys, Met, Trp, Asn, Gln, and N-terminal Glu.

Therefore we recommend storing peptides in solution for as short a time as possible. Avoid repeated freeze thaw cycles by dividing the peptide solution into aliquots and storing the aliquots at -20°C. Any portion of an aliquot unused after thawing should be discarded.

Peptides stored in solution can occasionally be susceptible to bacterial degradation. We recommend using sterile solutions or passing the peptide solution through a 0.2 µm filter to remove potential bacterial contamination whenever possible.

**References:**

**Garcia-Calvo** *et al* (1998) Inhibition of human caspases by peptide-based and macromolecular inhibitors. *J.Biol.Chem.* **273** 32608. PMID: 9829999.

**King** *et al* (1998) Processing/activation of caspases, -3 and -7 and -8 but not caspase-2, in the induction of apoptosis in B-chronic lymphocytic leukemia cells. *Leukemia* **12** 1553. PMID: 9766499.

**Kunstle** *et al* (1997) ICE-protease inhibitors block murine liver injury and apoptosis caused by CD95 or by TNF-α. *Immunol.Lett.* **55** 5. PMID: 9093874.

Caution - Not Fully Tested • Research Use Only • Not For Human or Veterinary Use

**bio-techne.com**

info@bio-techne.com

techsupport@bio-techne.com

**North America**

Tel: (800) 343 7475

**China**

info.cn@bio-techne.com

Tel: +86 (21) 52380373

**Europe Middle East Africa**

Tel: +44 (0)1235 529449

**Rest of World**

www.tocris.com/distributors

Tel: +1 612 379 2956