Z-DEVD-FMK

Technical Data

Molecular Weight	668.66	**Storage**	3 years	-20°C	powder
Formula	$C_{30}H_{41}FN_4O_{12}$		2 years	-80°C	in solvent
CAS No.	210344-95-9	**Synonyms**	Caspase-3 Inhibitor		
Chemical Name	L-Valinamide, N-[(phenylmethoxy)carbonyl]-L-α-aspartyl-L-α-glutamyl-N-[(1S)-3-fluoro-1-(2-methoxy-2-oxoethyl)-2-oxopropyl]-, 1,2-dimethyl ester				
Solubility (25°C) *	In vitro	DMSO	100 mg/mL (149.55 mM)		
		Water	Insoluble		
		Ethanol	Insoluble		
	In vivo（should be freshly prepared each time）	2% DMSO+30% PEG 400+5% Tween 80+ddH2O	1mg/mL		

* <1 mg/ml means slightly soluble or insoluble.
* Please note that Selleck tests the solubility of all compounds in-house, and the actual solubility may differ slightly from published values. This is normal and is due to slight batch-to-batch variations.

Preparing Stock Solutions

Volume / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.4955 mL	7.4776 mL	14.9553 mL
5 mM	0.2991 mL	1.4955 mL	2.9911 mL
10 mM	0.1496 mL	0.7478 mL	1.4955 mL
50 mM	0.0299 mL	0.1496 mL	0.2991 mL

Biological Activity

Description	Z-DEVD-FMK is a specific, irreversible **Caspase-3** inhibitor, and also shows potent inhibition on caspase-6, caspase-7, caspase-8, and caspase-10.
Targets	Caspase-3 [1]
In vitro	Z-DEVD-FMK (1–200 μM) inhibits D4-GDI cleavage and apoptosis in a concentration-dependent manner. [1] Z-DEVD-FMK reduces ceramide-induced cardiomyocyte death and significantly inhibits the activation of caspase 3. [3] Z-DEVD-FMK (100μM) attenuates OxyHb-induced cell detachment, reduced caspase-2 and -3 activities, abolishes OxyHb-induced DNA ladders, and prevents OxyHb-induced cleavage of PARP in cultured brain microvessel endothelial cells. [4] Z-DEVD-FMK (100 μM) blocks MPP+-induced increases in caspase-3 enzyme activity. Z-DEVD-FMK dose dependently blocks 6-OHDA-induced apoptotic cell death with IC50 of 18 μM. [5]
In vivo	Z-DEVD-FMK, before and after injury, markedly reduces post-traumatic apoptosis, and significantly improved neurological recovery. [2]
FeaturesS7312	

Protocol *(Only for Reference)*

Kinase Assay: [5]

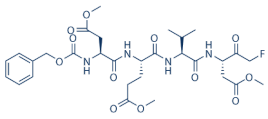
Caspase activity assay	Caspase-3 and caspase-9 activities are measured using fluorescent-based substrate. After treatment, the cells are resuspended in lysis buffer (50 mM Tris HCl, 1 mM EDTA, and 10 mM EGTA) containing 10 mM digitonin for 20 min at 37°C. Supernatants are treated with either of the fluorogenic substrates Ac-DEVD-AFC for caspase-3 or Ac-LEHD-AFC for caspase-9 for 1 h at 37°C and fluorescence is measured at excitation at 400 nm and emission at 505 nm using a Gemini XS fluorescence plate reade

Cell Assay: [5]

Cell lines	N27 cells
Concentrations	~50 μM
Incubation Time	24 hours
Method	N27 cells are incubated with 100 μM 6-OHDA for 24 h or 300 μM MPP+ for 36 h in the presence or absence of 50 μM Z-DEVD-FMK and cell death is determined by MTT (3-(4,5-dimethylthiazol-3-yl)-2,5-diphenyl tetrazolium bromide) assay, which is widely used to assess cell viability. After treatment, the cells are incubated in serum-free medium containing 0.25 mg/ml MTT for 3 h at 37°C. Formation of formazan from tetrazolium is measured at 570 nm with a reference wavelength at 630 nm using a SpectraMax microplate reader.

Animal Study: [2]

Chemical Structure



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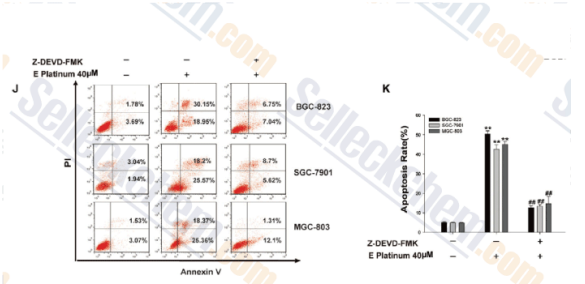
Animal Models	Male Sprague Dawley rats with Brain trauma.
Formulation	DMSO
Dosages	160 ng
Administration	Intracerebroventricular administration

References:

[1] Rickers A, et al. Eur J Immunol. 1998, (1), 296-304.
[2] Yakovlev AG, et al. J Neurosci. 1997, 17(19), 7415-7424.
[3] Wang J, et al. J Card Fail. 2000, 6(3), 243-249.
[4] Meguro T, et al. Stroke. 2001, 32(2), 561-566.
[5] Kanthasamy AG, et al. Free Radic Biol Med. 2006, 41(10), 1578-1589.

Customer Product Validation



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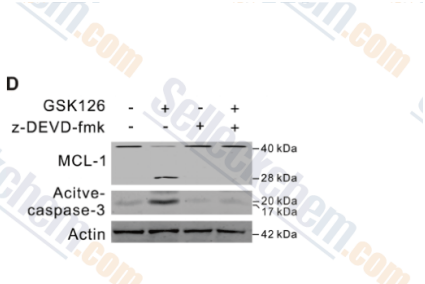
, , Mol Carcinog, 2016, 56(1):218-231
(J,K)After pre-treated with Caspase-3 inhibitor Z-DEVD-FMK 50μM, the apoptotic rates of cells induced by E Platinum in BGC-823, MGC-803, and SGC-7901 cells were detected by Annexin V/PI double-staining assay. Ann.V-/PI- as healthy cells, Ann.+/PI- as early apoptotic cells, Ann.+/PI+ probably as late apoptotic cells. Data were shown as means SD for three independent experiments (*P<0.05 and **P<0.01 compared with control, ##P<0.01 compared to Z-DEVD-FMK+40 μM E Platinum group with treatment of 40 μM E Platinum).



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Data from [Data independently produced by , , Oncotarget, 2017, 8(2):3396-3411]
Immunoblotting analysis was performed for the active-caspase-3 and cleavage of MCL-1 in MM.1S cells treated with z-DEVD-fmk (20 μM, 1 h) and following GSK126 (25 μM, 24 h).

Z-DEVD-FMK has been referenced in publications.

Dioscin inhibits the growth of human osteosarcoma by inducing G2/M-phase arrest, apoptosis, and GSDME-dependent cell death in vitro and in vivo. [J Cell Physiol, 2020, 235(3):2911-2924]	PubMed: 31535374
Combination of Hypoglycemia and Metformin Impairs Tumor Metabolic Plasticity and Growth by Modulating the PP2A-GSK3β-MCL-1 Axis. [Cancer Cell, 2019, 35(5):798-815]	PubMed: 31031016
Combination of Hypoglycemia and Metformin Impairs Tumor Metabolic Plasticity and Growth by Modulating the PP2A-GSK3β-MCL-1 Axis. [Cancer Cell, 2019, 35(5):798-815.e5]	PubMed: 31031016
Sinularin exerts anti-tumor effects against human renal cancer cells relies on the generation of ROS. [J Cancer, 2019, 10(21):5114-5123]	PubMed: 31602264
Caspase-1-dependent mechanism mediating the harmful impacts of the quorum-sensing molecule N-(3-oxo-dodecanoyl)-l-homoserine lactone on the intestinal cells. [J Cell Physiol, 2019, 234(4):3621-3633]	PubMed: 30471106
Palbociclib triggers apoptosis in bladder cancer cells by Cdk2-induced Rad9-mediated reorganization of the Bak.Bcl-xl complex. [Biochem Pharmacol, 2019, 163:133-141]	PubMed: 30772267
Enhancement of sorafenib-mediated death of Hepatocellular carcinoma cells by Carnosic acid and Vitamin D2 analog combination. [J Steroid Biochem Mol Biol, 2019, 197:105524]	PubMed: 31704246
The molecular mechanisms underlying BCR/ABL degradation in chronic myeloid leukemia cells promoted by Beclin1-mediated autophagy. [Cancer Manag Res, 2019, 11:5197-5208]	PubMed: 31239774
Isobavachalcone isolated from Psoralea corylifolia inhibits cell proliferation and induces apoptosis via inhibiting the AKT/GSK-3β/β-catenin pathway in colorectal cancer cells. [Drug Des Devel Ther, 2019, 13:1449-1460]	PubMed: 31118579
The effects and mechanism of peiminine-induced apoptosis in human hepatocellular carcinoma HepG2 cells [PLoS One, 2019, 14(1):e0201864]	PubMed: 30615617