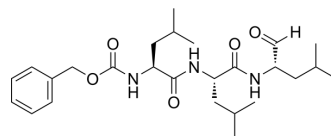


## MG-132

<b>Cat. No.:</b>	HY-13259		
<b>CAS No.:</b>	133407-82-6		
<b>Molecular Formula:</b>	C <sub>26</sub> H <sub>41</sub> N <sub>3</sub> O <sub>5</sub>		
<b>Molecular Weight:</b>	475.62		
<b>Target:</b>	Proteasome; Autophagy; Apoptosis		
<b>Pathway:</b>	Metabolic Enzyme/Protease; Autophagy; Apoptosis		
<b>Storage:</b>	Powder	-20°C	3 years
	In solvent	-80°C	6 months
		-20°C	1 month



### SOLVENT & SOLUBILITY

<b>In Vitro</b>	DMSO : 100 mg/mL (210.25 mM; Need ultrasonic)					
	<b>Preparing Stock Solutions</b>	<b>Solvent</b>	<b>Mass</b>	<b>1 mg</b>	<b>5 mg</b>	<b>10 mg</b>
		<b>Concentration</b>				
		<b>1 mM</b>		2.1025 mL	10.5126 mL	21.0252 mL
		<b>5 mM</b>		0.4205 mL	2.1025 mL	4.2050 mL
	<b>10 mM</b>		0.2103 mL	1.0513 mL	2.1025 mL	
Please refer to the solubility information to select the appropriate solvent.						
<b>In Vivo</b>	1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 1.67 mg/mL (3.51 mM); Clear solution					
	2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: 1.67 mg/mL (3.51 mM); Suspended solution; Need ultrasonic					
	3. Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 1.67 mg/mL (3.51 mM); Clear solution					

### BIOLOGICAL ACTIVITY

<b>Description</b>	MG-132 (Z-Leu-Leu-Leu-al) is a potent proteasome and calpain inhibitor with IC <sub>50</sub> s of 100 nM and 1.2 μM, respectively. MG-132 effectively blocks the proteolytic activity of the 26S proteasome complex. MG-132, a peptide aldehyde, also is an autophagy activator. MG-132 also induces apoptosis <sup>[1][2][3]</sup> .
<b>IC<sub>50</sub> &amp; Target</b>	IC <sub>50</sub> : 100 nM (Proteasome), 1.2 μM (Calpain) <sup>[1][3]</sup>
<b>In Vitro</b>	MG-132 (Z-Leu-Leu-Leu-al) initiates neurite outgrowth in PC12 cells at a low concentration (30 nM) and is a very strong inhibitor of 20S proteasome <sup>[3]</sup> .

MG-132 (10  $\mu$ M; 1 hour) reverses the effects of TNF-  $\alpha$  on I  $\kappa$  B degradation and NF- $\kappa$  B activation in A549 cells<sup>[4]</sup>.  
 MG-132 (0.75-5  $\mu$ M; 24 hours) potently induces p53-dependent apoptosis in KIM-2 cells by 26S proteasome inhibition<sup>[5]</sup>.  
 MG-132 (10-40  $\mu$ M; 24 hours) significantly reduces the viability of C6 glioma cells in both time- and concentration-dependent manners and shows the IC<sub>50</sub> of 18.5  $\mu$ M at 24 hours<sup>[6]</sup>.  
 MG-132 (18.5  $\mu$ M; 24 hours) induces down-regulation of anti-apoptotic proteins Bcl-2 and XIAP and up-regulates expression of pro-apoptotic protein Bax and caspase-3<sup>[6]</sup>.  
 MCE has not independently confirmed the accuracy of these methods. They are for reference only.

#### Cell Viability Assay<sup>[3]</sup>

Cell Line:	C6 glioma cells
Concentration:	10, 20, 30, 40 $\mu$ M
Incubation Time:	24 hours
Result:	Significantly reduced the viability of C6 glioma cells beginning at 6 h in both time- and concentration-dependent manners and showed the IC <sub>50</sub> of 18.5 $\mu$ M at 24 hours.

#### Western Blot Analysis<sup>[3]</sup>

Cell Line:	A549 cells
Concentration:	10 $\mu$ M
Incubation Time:	1 hour
Result:	Reversed the effects of TNF- $\alpha$ on I $\kappa$ B degradation and resulted in a reversal of TNF- $\alpha$ -induced NF- $\kappa$ B activation.

#### In Vivo

MG132 (10 mg/kg; i.p.; daily for 25 days starting 5 days after EC9706 cells injection) significantly inhibits tumor growth of the EC9706 xenograft without causing toxicity to mice<sup>[7]</sup>.  
 MG-132 (1 mg/kg; i.v.; twice a week for 4 weeks) shows potent tumor inhibitory effect against mice bearing HeLa tumors<sup>[8]</sup>.  
 MG-132 (1-10  $\mu$ g/kg/24 hours; subcutaneously implanted osmotic pumps; for 8 days) greatly increases the expression levels of  $\beta$ -dystroglycan,  $\alpha$ -dystroglycan,  $\alpha$ -sarcoglycan, and dystrophin in skeletal muscle lysates in mice (six-month-old male C57BL/10ScSn DMD mdx mice)<sup>[9]</sup>.  
 MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	5- to 6-weeks old female athymic nude mice (EC9706 xenograft)
Dosage:	10 mg/kg
Administration:	I.p.; daily for 25 days starting 5 days after EC9706 cells injection
Result:	Significantly inhibited tumor growth of the EC9706 xenograft without causing toxicity to the mice.

Animal Model:	Five-week-old female C.B-17/lcr-scid/scidJcl mice (bearing HeLa cells) <sup>[8]</sup>
Dosage:	1 mg/kg
Administration:	Intravenous injection; twice a week for 4 weeks
Result:	The growth inhibition rates in HeLa tumors was 49% compared to the control.

- Nature. 2021 Nov;599(7885):491-496.
- Cell. 2023 Feb 16;186(4):803-820.e25.
- Science. 2020 Dec 4;370(6521):eaay2002.
- Cancer Cell. 2023 Jun 12;41(6):1073-1090.e12.
- Cancer Cell. 2022 Sep 19;S1535-6108(22)00436-6.

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- [9]. Bonuccelli G, et al. Proteasome inhibitor (MG-132) treatment of mdx mice rescues the expression and membrane localization of dystrophin and dystrophin-associated proteins. *Am J Pathol.* 2003 Oct;163(4):1663-75.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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