

## Nisin Z

<b>Cat. No.:</b>	HY-P3466
<b>CAS No.:</b>	137061-46-2
<b>Molecular Formula:</b>	C <sub>141</sub> H <sub>229</sub> N <sub>41</sub> O <sub>38</sub> S <sub>7</sub>
<b>Molecular Weight:</b>	3331.05
<b>Target:</b>	Bacterial; Fungal
<b>Pathway:</b>	Anti-infection
<b>Storage:</b>	Sealed storage, away from moisture and light, under nitrogen Powder    -80°C    2 years -20°C    1 year * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light, under nitrogen)

# Nisin Z

### SOLVENT & SOLUBILITY

<b>In Vitro</b>	H <sub>2</sub> O : 10 mg/mL (3.00 mM; Need ultrasonic)					
	DMSO : 2 mg/mL (0.60 mM; Need ultrasonic)					
		Solvent Concentration	Mass			
	<b>Preparing Stock Solutions</b>			1 mg	5 mg	10 mg
		1 mM		0.3002 mL	1.5010 mL	3.0021 mL
5 mM			---	---	---	
	10 mM		---	---	---	
Please refer to the solubility information to select the appropriate solvent.						
<b>In Vivo</b>	<ol style="list-style-type: none"> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% corn oil Solubility: ≥ 0.2 mg/mL (0.06 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% saline Solubility: ≥ 0.2 mg/mL (0.06 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 40% PEG300 &gt;&gt; 5% Tween-80 &gt;&gt; 45% saline Solubility: ≥ 0.14 mg/mL (0.04 mM); Clear solution</li> </ol>					

### BIOLOGICAL ACTIVITY

<b>Description</b>	Nisin Z is an antimicrobial and anti-inflammatory peptide. Nisin Z is effective against Gram-positive bacteria and fungi, such as <i>C. albicans</i> <sup>[1][4]</sup> .
<b>In Vitro</b>	Nisin Z (10 µg/mL, 24 h) increases gingival fibroblasts detachment and differentiation <sup>[2]</sup> . Nisin Z (25-75 µg/mL, 24 h) decreases <i>C. albicans</i> adhesion to the gingival cells <sup>[2]</sup> .

Nisin Z (500 and 1000 µg/mL, 24 h) inhibits germ tube formation by *C. albicans*<sup>[3]</sup>.  
 Nisin Z (100 µg/mL, 12 h) reduces the production of LPS-induced pro-inflammatory cytokines (i.e., IL-6, TNF-α, IL-1β) in MCF10A cells<sup>[4]</sup>.  
 Nisin Z (10-100 µg/mL, 12 h) inhibits the activation of the ERK1/2 and p38 MAPK signaling pathway in LPS-induced MCF10A cells<sup>[4]</sup>.  
 MCE has not independently confirmed the accuracy of these methods. They are for reference only.  
 Cell Viability Assay<sup>[3]</sup>

Cell Line:	<i>C. albicans</i>
Concentration:	100, 500, 1000 µg/mL
Incubation Time:	24, 48, and 72 h
Result:	Reduced <i>C. albicans</i> growth.

#### Western Blot Analysis<sup>[4]</sup>

Cell Line:	LPS-induced MCF10A cells
Concentration:	10-100 µg/mL
Incubation Time:	12 h
Result:	Inhibited the phosphorylation of p38 and ERK1/2.

#### In Vivo

Nisin Z (1, 5, and 10 mg/kg, i.p.) prevents the pathological damage in mastitis mouse model caused by LPS<sup>[4]</sup>.  
 MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Mastitis mouse model <sup>[4]</sup>
Dosage:	1, 5, and 10 mg/kg
Administration:	i.p., one hour before treatment of LPS.
Result:	Reduced inflammatory cell infiltration. Showed a reduction in inflammatory cytokine levels.

## REFERENCES

- [1]. Webber JL, et al. Incorporation and antimicrobial activity of nisin Z within carrageenan/chitosan multilayers. *Sci Rep.* 2021 Jan 18;11(1):1690.
- [2]. Akerey B, et al. In vitro efficacy of nisin Z against *Candida albicans* adhesion and transition following contact with normal human gingival cells. *J Appl Microbiol.* 2009 Oct;107(4):1298-307.
- [3]. Le Lay C, et al. Nisin Z inhibits the growth of *Candida albicans* and its transition from blastospore to hyphal form. *J Appl Microbiol.* 2008 Nov;105(5):1630-9.
- [4]. Huang F, et al. Nisin Z attenuates lipopolysaccharide-induced mastitis by inhibiting the ERK1/2 and p38 mitogen-activated protein kinase signaling pathways. *J Dairy Sci.* 2022 Apr;105(4):3530-3543.

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

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