

## Magainin 2

<b>Cat. No.:</b>	HY-P0270	
<b>CAS No.:</b>	108433-95-0	
<b>Molecular Formula:</b>	$C_{114}H_{180}N_{30}O_{29}S$	
<b>Molecular Weight:</b>	2466.9	GIGKFLHSAKKFGKAFVGEIMNS
<b>Sequence:</b>	Gly-Ile-Gly-Lys-Phe-Leu-His-Ser-Ala-Lys-Lys-Phe-Gly-Lys-Ala-Phe-Val-Gly-Glu-Ile-Met-Asn-Ser	
<b>Sequence Shortening:</b>	GIGKFLHSAKKFGKAFVGEIMNS	
<b>Target:</b>	Bacterial; Fungal; Antibiotic	
<b>Pathway:</b>	Anti-infection	
<b>Storage:</b>	Sealed storage, away from moisture and light	
	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)	

### SOLVENT & SOLUBILITY

#### In Vitro

H<sub>2</sub>O : 50 mg/mL (20.27 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent	1 mg	5 mg	10 mg
	Concentration			
	1 mM	0.4054 mL	2.0268 mL	4.0537 mL
	5 mM	0.0811 mL	0.4054 mL	0.8107 mL
	10 mM	0.0405 mL	0.2027 mL	0.4054 mL

Please refer to the solubility information to select the appropriate solvent.

### BIOLOGICAL ACTIVITY

#### Description

Magainin 2 (Magainin II) is an antimicrobial peptide (AMP) isolated from the skin of the African clawed frog *Xenopus laevis*. Magainin 2 displays antibiotic activity against numerous gram-negative and gram-positive bacteria. Magainin 2 also is active against protozoa<sup>[1]</sup>. Magainin 2 exerts its cytotoxicity effects by preferential interactions with anionic phospholipids abundant in bacterial membranes<sup>[2]</sup>.

#### In Vitro

Magainin 2 exhibits bactericidal effects and induces morphological changes in *Escherichia coli* regarding early apoptosis. Magainin 2 induces the expression of a bacterial protein with affinity for the caspase substrate and effects the expression of RecA as a caspase-like protein<sup>[1]</sup>. Magainin 2 kill bacteria by permeabilizing the cell membranes without exhibiting significant toxicity against mammalian cells. The main target of the peptide is considered to be the lipid matrix of the membranes. Application of 10 µg/mL magainin 2 to *Paramecium caudatum*, a protozoan, in pond water caused an osmotic swelling of the cell and a subsequent cell burst, suggesting that the peptide could perturb membrane functions responsible

for osmotic balance<sup>[2]</sup>. Magainin 2 permeabilizes bacterial and mammalian membranes in significantly different ways. The peptide forms pores with a diameter of about 2.8 nm (less than 6.6 nm) in *B. megaterium*, and translocates into the cytosol. In contrast, the peptide significantly perturbs the membrane of CHO-K1 cells, permitting the entry of a large molecule (larger than 23 nm) into the cytosol, accompanied by membrane budding and lipid flip-flop, mainly accumulating in mitochondria and nuclei<sup>[3]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## PROTOCOL

### Cell Assay <sup>[1]</sup>

*Escherichia coli* cells are incubated with magainin 2 (50 µg /mL). The cultures are acquired after incubation for 0, 2, 4, 6, and 8 h, respectively, and spread onto LB agar plates, and then the colony-forming units are counted after incubation for 24 h at 37°C. The percentage survival is determined relative to the control treatment<sup>[1]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## REFERENCES

[1]. M Zasloff, et al. Magainins, a class of antimicrobial peptides from *Xenopus* skin: isolation, characterization of two active forms, and partial cDNA sequence of a precursor. *Proc Natl Acad Sci U S A*. 1987 Aug;84(15):5449-53.

[2]. K Matsuzaki, et al. Magainins as paradigm for the mode of action of pore forming polypeptides. *Biochim Biophys Acta*. 1998 Nov 10;1376(3):391-400.

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

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