

## Thanatin

Cat. No.:	HY-P5601
CAS No.:	214542-43-5
Molecular Formula:	C <sub>103</sub> H <sub>177</sub> N <sub>35</sub> O <sub>27</sub> S <sub>3</sub>
Molecular Weight:	2433.92
Sequence:	Gly-Ser-Lys-Lys-Pro-Val-Pro-Ile-Ile-Tyr-Cys-Asn-Arg-Arg-Thr-Gly-Lys-Cys-Gln-Arg-Met (Disulfide bridge:Cys11-Cys18)
Sequence Shortening:	GSKKPVPIIYCNRRRTGKCQRM (Disulfide bridge:Cys11-Cys18)
Target:	Bacterial; Fungal
Pathway:	Anti-infection
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.

### BIOLOGICAL ACTIVITY

<b>Description</b>	<p>Thanatin is an inducible cationic antimicrobial peptide. Thanatin is a pathogen-inducible single-disulfide-bond-containing β-hairpin AMP. Thanatin displays broad-spectrum activity against both Gram-negative and Gram-positive bacteria as well as against various species of fungi with MICs of 0.3-40 μM, 0.6-40 μM and 0.6-20 μM, respectively. Thanatin has the property of competitive replacement of divalent cations from bacterial outer membrane (OM), leading to OM disruption<sup>[1][2]</sup>.</p>								
<b>In Vitro</b>	<p>Thanatin is strongly cationic (pI of 10.48) and contains a distinct short eight-residue basic loop created through a disulfide bond formation between residues Cys11 and Cys18 at the C-terminus. <sup>[1]</sup></p> <p>Thanatin exhibits potent inhibitory effect on the growth of all New Delhi metallo-β-lactamase-1 (NDM-1)-producing E. coli and K. pneumoniae strains at 0.4-3.2 μM of the minimum inhibitory concentration (MIC) values<sup>[2]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>								
<b>In Vivo</b>	<p>Thanatin (1, 3, 6 mg/kg; ip; at 1 and 6 h) protects mice infected with NDM-1-producing E. coli<sup>[2]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <table border="1"> <tr> <td>Animal Model:</td> <td>Male BALB/c mice aged 8-10 weeks and weighing 18-22 g with CFU E. coli XJ141026</td> </tr> <tr> <td>Dosage:</td> <td>1, 3, 6 mg/kg</td> </tr> <tr> <td>Administration:</td> <td>Intraperitoneally injected; at 1 and 6 h</td> </tr> <tr> <td>Result:</td> <td>1, 3, and 6 mg/kg markedly increased the survival rate from 0 to 30%, 70%, and 100%, respectively. Showed that the bacterial titers decreased with increasing drug dose. Rescued the pathological damages (large amounts of inflammatory cell infiltration, alveolar fusion, congestion in the spleen red pulp area, hepatic sinusoidal dilation and congestion) in a dose-dependent manner.</td> </tr> </table>	Animal Model:	Male BALB/c mice aged 8-10 weeks and weighing 18-22 g with CFU E. coli XJ141026	Dosage:	1, 3, 6 mg/kg	Administration:	Intraperitoneally injected; at 1 and 6 h	Result:	1, 3, and 6 mg/kg markedly increased the survival rate from 0 to 30%, 70%, and 100%, respectively. Showed that the bacterial titers decreased with increasing drug dose. Rescued the pathological damages (large amounts of inflammatory cell infiltration, alveolar fusion, congestion in the spleen red pulp area, hepatic sinusoidal dilation and congestion) in a dose-dependent manner.
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### REFERENCES

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[1]. Rachita Dash, et al. Thanatin: An Emerging Host Defense Antimicrobial Peptide with Multiple Modes of Action. *Int J Mol Sci.* 2021 Feb 3;22(4):1522.

[2]. Bo Ma, et al. The antimicrobial peptide thanatin disrupts the bacterial outer membrane and inactivates the NDM-1 metallo- $\beta$ -lactamase. *Nat Commun.* 2019 Aug 6;10(1):3517.

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: [tech@MedChemExpress.com](mailto:tech@MedChemExpress.com)

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA