

Product Information

Melittin from honey bee venom

Catalog Numbers **M2272**, **M 7391**

Storage Temperature -20 °C

CAS RN: 20449-79-0

Molecular Formula: C₁₃₁H₂₂₉N₃₉O₃₁

Molecular Weight: 2846.46

[α]_D: -89.52° (c = 0.409; 21 °C)¹

Product Description

Melittin is a strongly basic peptide that is the principal component of honey bee (*Apis mellifica*) venom. It comprises 40-50% of the dried venom and causes disruption of normal cellular activity and cell lysis.¹ Although it is a monomer with a molecular weight of 2.8 kDa, solutions display molecular weights of 11.8 - 13.8 kDa, which suggests aggregation.² It has been used in affinity chromatography to purify calmodulin.³ The interaction of melittin with S100b protein in the presence and absence of calcium was studied by fluorescence polarization, UV difference spectroscopy, and sulfhydryl derivatization.⁴

Studies *in vitro* have shown that bee venom has anti-inflammatory activity similar to that of cyclophosphamide. Melittin appears to be the active constituent and seems to act by interfering with superoxide radical production from human leukocytes.⁵

Melittin is a hemolytic peptide. A study of the effect of sphingomyelin (SM), one of the main lipids in the external monolayer of the erythrocyte plasma membrane, on the ability of melittin to permeabilize liposomes supported the notion that SM may regulate the stability of size-defined melittin pores in natural membranes.⁶ Depending on the melittin/phospholipid ratio, melittin can either inhibit or activate secretory phospholipase A₂ type II when erythrocyte membranes served as a biologically relevant substrate.⁷

(Na⁺/K⁺) ATPase is inhibited by melittin. KCl and NaCl protect the enzyme from melittin inhibition. Analysis of the K⁺ and Na⁺ protection against melittin inhibition suggests a kinetic model which is consistent with slowly reversible melittin binding, and mutually exclusive binding of melittin with K⁺ and Na⁺.⁸

Precautions and Disclaimer

These products are for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Soluble in water or PBS at 5 mg/ml, yielding a clear, colorless to faint yellow solution.

References

1. The Merck Index, 14th ed., Monograph number 5824.
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3. Kincaid, R. L., and Coulson, C. C., Rapid purification of calmodulin and S-100 protein by affinity chromatography with melittin immobilized to sepharose. *Biochem. Biophys. Res. Commun.*, **133(1)**, 256-264 (1985).
4. Baudier, J., et al., Comparison of S100b protein with calmodulin: interactions with melittin and microtubule-associated tau proteins and inhibition of phosphorylation of tau proteins by protein kinase C. *Biochemistry*, **26(10)**, 2886-2893 (1987).
5. Somerfield, S. D., Bee venom and arthritis: magic, myth or medicine? *N. Z. Med. J.*, **99(800)**, 281-283 (1986).
6. Gomara, M. J., et al., Effects of sphingomyelin on melittin pore formation. *Biochim. Biophys. Acta*, **1612(1)**, 83-89 (2003).
7. Koumanov, K., et al., Bimodal regulatory effect of melittin and phospholipase A(2)-activating protein on human type II secretory phospholipase A(2). *Cell Biol. Int.*, **27(10)**, 871-877 (2003).
8. Cuppoletti, J., and Abbott, A. J., Interaction of melittin with the (Na⁺/K⁺) ATPase: evidence for a melittin-induced conformational change. *Arch. Biochem. Biophys.*, **283(2)**, 249-257 (1990).

PHC 11/09-1

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