Melittin

Cat. No.:	HY-P0233
CAS No.:	20449-79-0
Molecular Formula:	$C_{131}H_{229}N_{39}O_{31}$
Molecular Weight:	2846.46
Sequence:	Gly-Ile-Gly-Ala-Val-Leu-Lys-Val-Leu-Thr-Thr-Gly-Leu-Pro-Ala-Leu-Ile-Ser-Trp-Ile-Lys-Arg-Lys-Arg-Gln-Gln-NH2
Sequence Shortening:	GIGAVLKVLTTGLPALISWIKRKRQQ-NH2
Target:	Phospholipase
Pathway:	Metabolic Enzyme/Protease
Storage:	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)

BIOLOGICAL ACTIVITY

Description	Melittin is a PLA_2 activator, stimulates the activity of the low molecular weight PLA_2, while it does not the increase activity of the high molecular weight PLA_2[1][2].
IC_{50} & Target	PLA_2[1]
In Vitro	Melittin, an immunologically related PLA_2 stimulating peptide from bee venom, increases the activity of the high molecular weight enzyme[1]. Melittin is a cytotoxic peptide from bee venom. Melittin exhibits toxicity against both A2780CR and A2780 cells, with IC_{50} values of 4.5 and 6.8 μg/mL, respectively. Melittin has natural anti-bacterial, anti-viral, and anti-inflammatory properties. It has also been shown to have diverse anticancer effects in several different cancer cell lines including those of gastric, breast, ovarian, liver, prostate, cervical, and lung origins. The mechanisms by which Melittin, an amphipathic haemolytic peptide, exerts its potential anticancer effects include inhibition of cell proliferation, induction of apoptosis, and direct necrosis. Melittin can also prevent EGF-induced cell invasion through its inhibition of the PI3K/Akt/mTOR signaling pathway, but this is primarily related to breast cancer cells[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Melittin is purified from bee venom by reversed phase liquid chromatography and reconstituted in sterile water to form a stock solution of 1 mg/mL before storage at -20 °C until required for analysis. Cell viability is assessed by an Alamar Blue (AB) cell viability reagent. Both A2780 and A2780CR cells are seeded at 1×10^4 cells/well in 96-well plates and incubated at 37 °C and 5% CO_2 in a humidified atmosphere for 24 h. After this incubation period, the cells are treated with various concentrations of Melittin ranging from 0.5 to 14 μg/mL in 100 μL of medium, and re-incubated at 37 °C and 5% CO_2 for a further 24 h. Triton X at 1% (v/v) and cell culture media are used as positive and negative controls, respectively. After this, AB is added at a final concentration of 10% (v/v) and the resultant mixture is incubated for a further 4 h at 37 °C and 5% CO_2. Then, the plates are read at an excitation wavelength of 560 nm and the emission at 590 nm is recorded on a SpectraMax M3

microplate reader . Background-corrected fluorescence readings are converted to cell viability data for each test well by expressing them as percentages relative to the mean negative control value[2].

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CUSTOMER VALIDATION

- J Exp Med. 2022 May 2;219(5):e20212414.
- Cancer Lett. 2022 May 28;534:215615.
- Front Microbiol. 2020 Jul 31;11:1720.
- J Integr Med. 10 October 2022.
- FASEB J. 2020 Nov;34(11):14892-14904.

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REFERENCES

[1]. Steiner MR, et al. Responses of purified phospholipases A2 to phospholipase A2 activating protein (PLAP) and Melittin. Biochim Biophys Acta. 1993 Feb 10;1166(1):124-30.

[2]. Alonezi S, et al. Metabolomic Profiling of the Effects of Melittin on Cisplatin Resistant and Cisplatin Sensitive Ovarian Cancer Cells Using Mass Spectrometry and Biolog Microarray Technology. Metabolites. 2016 Oct 13;6(4). pii: E35.

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