

[Bee Venom Component Has Anti-Cancer Effect](#)

Identification of Melittin and Its Effect on Anti-Hepatocarcinoma Lines

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Bee venom is a natural substance that has been used medicinally as traditional Chinese medicine for more than thousands years. Melittin, a 26-residue peptide, is the major component and activity unit of bee venom, exhibits highly and extensive biological action in antibacterial, anti-arthritis, anti-radiation, analgesia, as well as effect on heart-blood vessel.

In recent years, it is noticeable that melittin studies in anti-tumor and anti-virus of acquired immune deficiency syndrome (AIDS).

Hepatocellular carcinoma is one of the most common malignancies in our country. It may be the important role of treatment in hepatocellular carcinoma with melittin, a unique and potent cell membrane perforation.

The purpose of paper is to identify of melittin extracted with AKTA protein production explorer system, and study anti-hepatocarcinoma action and mechanisms of melittin. It is great significance that this studies provided scientific data to promote clinical application of melittin in the treatment of malignant disease.

Methods: (1) The melittin extracted from bee venom with AKTA protein production explorer system were evaluated with high performance liquid chromatograph (HPLC) and mass spectrometry. (2) The efficiency of melittin in anti-hepatocarcinoma was determined MTT assay. (3) Morphologic observation, Flow cytometry, DNA electrophoresis, RT-PCR and TUNEL assay were used to study the cell cycle, proliferating cell nuclear antigen (PCNA), apoptosis and signal transduction of hepatocarcinoma cells treated by melittin.

Results: (1) Mass spectrometry result of the melittin isolated and purified from bee venom showed that m/z was 2846 dalton. Content of melittin was 97.32%, and relative standard deviation was 0.49%, which was detected with HPLC. (2) MTT assay results demonstrated that melittin can inhibit 4 hepatocarcinoma cells (HepG2, Hep3B, BEL-7402 and SMMC-7721) proliferation in vitro and 50% inhibitive concentration was 36.95 (g/ml, 16.24 (g/ml, 15.33 (g/ml and 102.77 (g/ml respectively. In addition, the growth inhibition was also observed in BEL-7402 cells from 6 hour to 48 hour. (3) Melittin could block cell cycle (S arrest) and down-regulated PCNA expression. (4) Hepatocarcinoma cells presented apoptosis features: chromatin condensation, nucleic fragmentation; Agarose electrophoresis showed marked DNA ladder; Flow cytometry analysis showed Annexin V positive cells and APO2.7 expression.(5) Anther experimental results show that cytosolic phospholipase A2 was activated and up-regulated Fas mRNA expression, after melittin treated BEL-7402 cells.

Conclusions: (1) The melittin extracted with AKTA protein production explorer system from bee venom was approved succeed and reliability. (2) 4 hepatoma cell lines, HepG2, Hep3B, SMMC-7721, and BEL-7402 were treated with melittin and the results demonstrated the suppression of cell growth and proliferation. It suggested that melittin isolated from bee venom possess significant anti-hepatocarcinoma effect. (3) Melittin has shown substantial efficacy in treating hepatocarcinoma in vitro.

These actions of melittin may result in the induction of apoptosis and the inhibition of growth. Data show that melittin induce apoptosis and the inhibition of proliferation, at least in part associated with down-regulated PCNA expression, arrest cycle, and the activation of phospholipase A2, as well as Fas signal transduction.

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