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Selective anastasis induction by bee venom in normal cells: a promising strategy for breast cancer therapy with minimal impact on cell viability

Key words: Anastasis; Bee venom; Cancer; Cytotoxicity

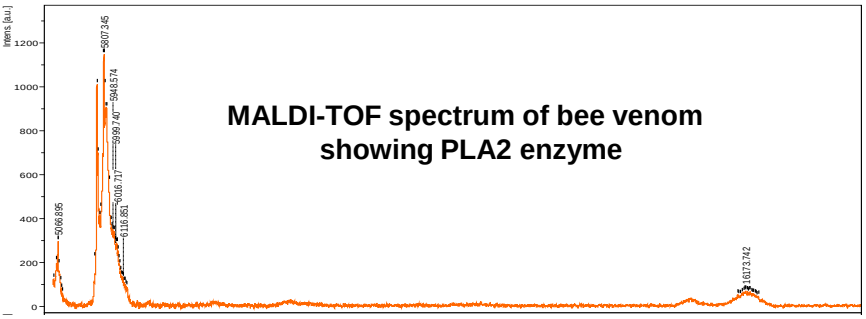
Background

Anastasis is a phenomenon described as a cellular escape from ethanol-induced cell death. Although the relevant mechanism has not yet been fully elucidated, anastasis is thought to play a role in drug resistance in cancer cells. To date, the regulation of anastasis in normal and cancerous cells has not been clarified.

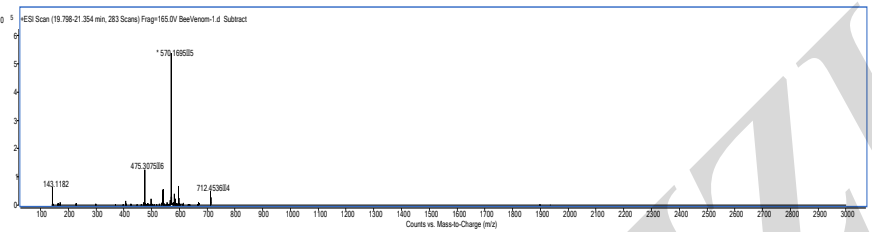
Aim

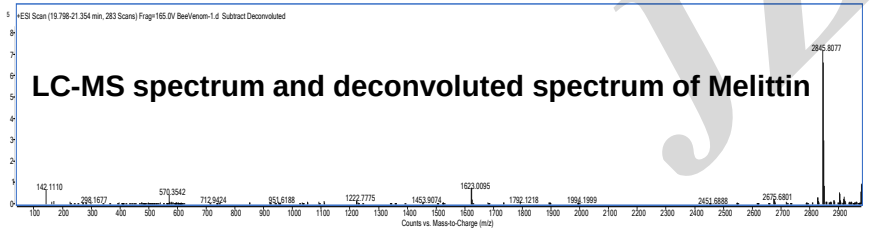
This study is the first to evaluate whether bee venom has similar selectivity for normal cells in producing an anastatic effect, compared to cancer cells.

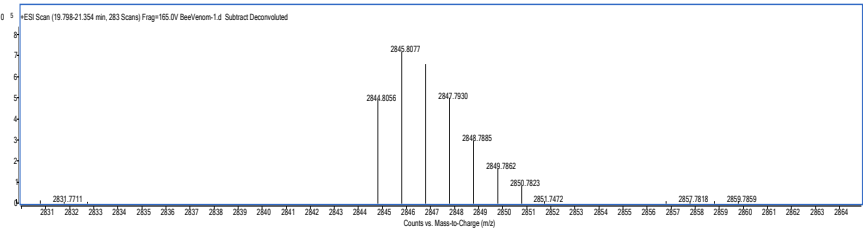
Venom is not that harmful, it is a good candidate for fighting with cancer in human body



Methodology







Trypan blue staining by automatic counter

Confluent cell culture

Bee venom treatment (24 h)
(with a group for untreated control)

Cisplatin treatment (24 h)
(with a group for untreated control)

- Detachment of cells
- Detection of cell viability from detached cells by trypan blue staining using automated cell counter

- Cells washed 3 times with 1xPBS and cultured in new flasks with clean media (without bee venom or cisplatin)

24h incubation **24h incubation**

- Detachment of cells
- Detection of cell viability from detached cells by trypan blue staining using automated cell counter

- Cells washed 3 times with 1xPBS and cultured in new flasks with clean media (without bee venom or cisplatin)

48h incubation **48h incubation**

- Detachment of cells
- Detection of cell viability from detached cells by trypan blue staining using automated cell counter

- Cells washed 3 times with 1xPBS and cultured in new flasks with clean media (without bee venom or cisplatin)

72h incubation **72h incubation**

- Detachment of cells
- Detection of cell viability from detached cells by trypan blue staining using automated cell counter

Innovation points

The results indicate;

- Bee venom induces anastasis in normal cells (MCF10A, ARPE19, and NIH3T3)

- However, bee venom causes irreversible cell death in breast cancer cells (MDA-MB-231 and MCF7).

- Liver cancer cells (HEPG2) were moderately more resistant to permanent cell death after bee venom treatment compared to breast cancer cells.

- However, cisplatin caused permanent non-selective cell death in both normal and cancerous cells.

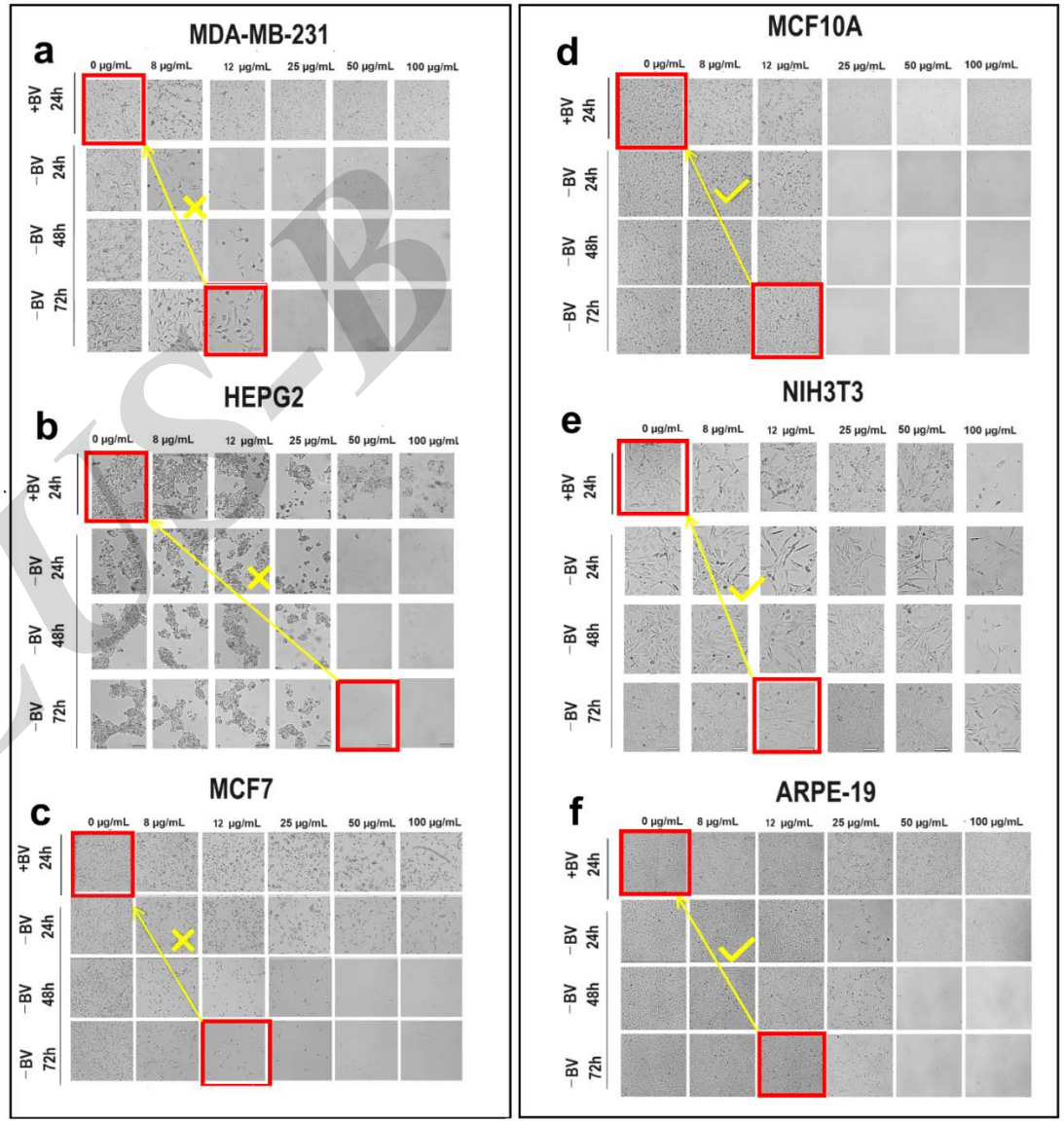
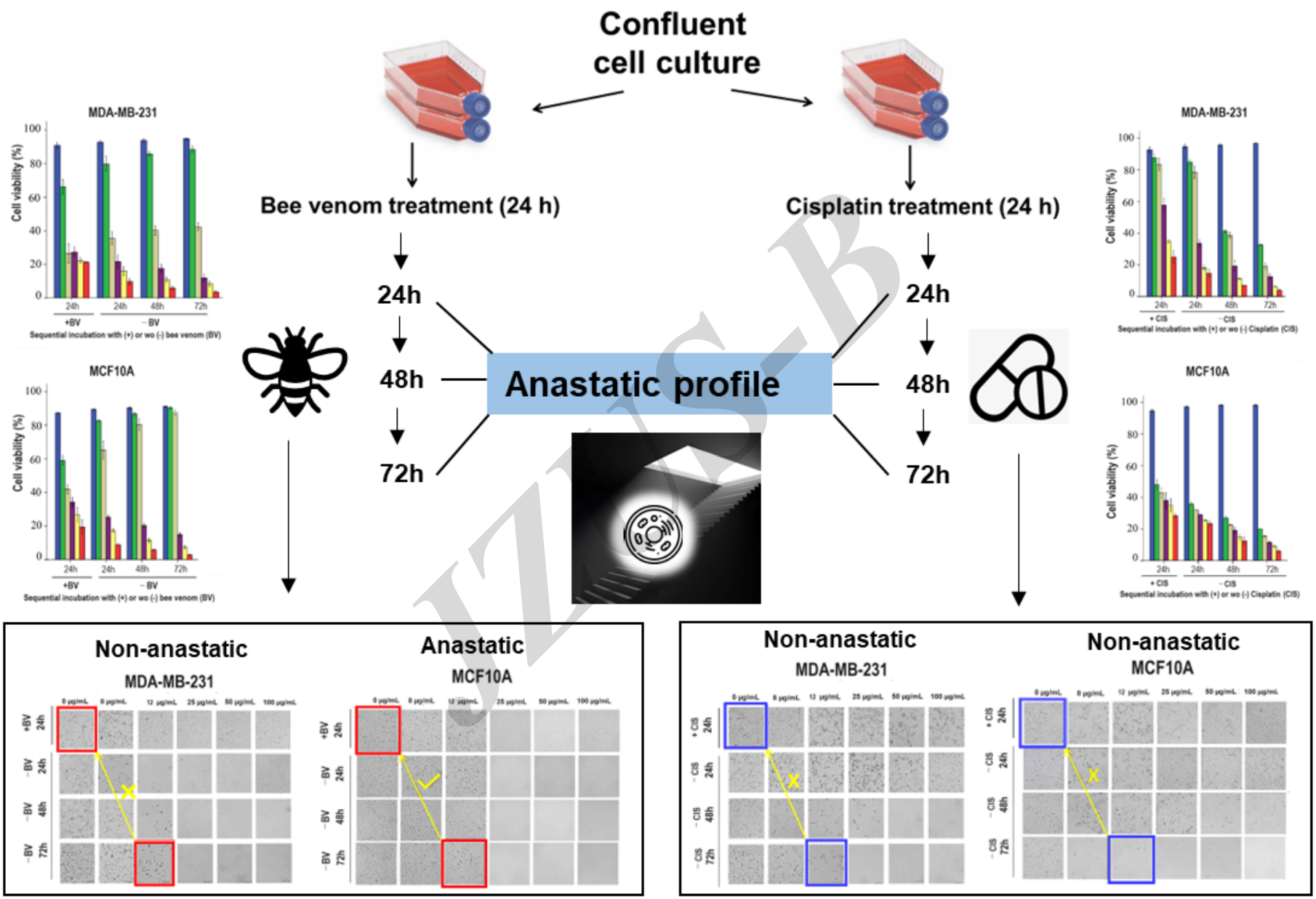


Figure 3


Confluent
cell culture
Bee venom treatment (24 h)
Cisplatin treatment (24 h)
24h
48h
72h
Anastatic profile
MDA-MB-231
MCF10A
Cell viability (%)
Sequential incubation with (+) or wo (-) bee venom (BV)
Sequential incubation with (+) or wo (-) Cisplatin (CIS)
Non-anastatic
Anastatic
Non-anastatic
Non-anastatic