BG-4, a bioactive peptide from *Momordica charantia*, promotes apoptosis in ovarian cancer cells

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**Introduction**

- OVCA is the most deadly form of gynecological cancers
- High rate of OVCA is correlated to the absence of screening which leads to diagnosis of disease at advanced stages
- High fatality rate of OVCA is due to late presentation of disease, cancer persistence, and chemotherapy resistance
- A key approach to combatting cancer is through activation of the apoptosis pathway

**Objectives**

- The objective of this research is to determine the ability of BG-4 to cause cytotoxicity to ovarian cancer cells (A27801AP and COV318) and determine the mechanism involved by measuring proteins associated with apoptosis.
- Specifically:
  - Effect of BG-4 on Bcl-2 and XIAP (anti-apoptotic proteins)
  - Effect of BG-4 on BAX and caspase-3 (pro-apoptotic proteins)
  - Effect of BG-4 on p21 and CDK2 (cell cycle proteins)

**Results**

**Effect of BG-4 on OVCA cell proliferation**

Figure 1. BG-4 purified from *Momordica charantia* caused dose-dependent cytotoxicity in COV318 OVCA cells. BG-4 treatment led to a decrease in viable cell count by 19.9% at 250 μg/mL. Mean values represented as bars with different letter(s) are statistically different from each other (P<0.05, n=2).

**Effect of BG-4 on apoptotic markers**

Figure 3. BG-4 modified expression of apoptotic proteins. (a) BG-4 promoted apoptosis by increasing caspase-3 (a) and BAX (b) leading to a reduced expression of XIAP (c) and no change in expression of Bcl-2 (d). Mean values represented as bars with different letter(s) are statistically different from each other (P<0.05, n=2).

**Cell cycle markers**

Figure 4. BG-4 modified expressions of cell cycle proteins in 1AP OVCA cell line. BG-4 increased the expression of p21 (a) leading to a reduction in expression of CDK2 (b). All analyses were done in at least two independent replicates. Mean values represented as bars with different letter(s) are statistically different from each other (P<0.05, n=2).

**Conclusions**

- BG-4 from *Momordica charantia* possesses anti-cancer properties
- BG-4 has the capability of activating apoptosis in human ovarian cancer cells
- The findings support the idea for potential use of BG-4 as an ovarian cancer therapeutic agent and should be further studied using *in vivo* models of ovarian carcinogenesis

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**References**