

## **The Effect of Pomegranate Juice Extract on the Viability and Morphology of Human Colorectal Cancer Cell, HCT-116**

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### **ABSTRACT**

**Introduction:** Colorectal cancer (CRC) is the second most common cancer in Malaysia. Current available treatments used have limitations due to the occurrence of drug resistance and unfavourable side effects.

**Objectives:** This study aims to investigate the potential cytotoxicity of pomegranate juice extract (PJE) on colorectal cancer cell line, HCT-116 colorectal cancer and CCD-841 normal colorectal cells.

**Methods:** Half maximal inhibitory concentration of the extract (IC<sub>50</sub>) was determined and selected for further investigations. Cell viability was assessed using MTT assay and morphological changes were observed using AO/PI staining.

**Results:** PJE induced modest cytotoxic effect against HCT-116 cancer cells. High concentrations and longer stimulation periods were needed to demonstrate the cytotoxic effect of the PJE (IC<sub>50</sub> of  $987.76 \pm 210.15$  µg/mL at 72-hours). AO/PI staining demonstrated that the PJE (1000 µg/mL) induced obvious morphological changes in HCT-116 cancer cells after 72 hours of treatment. Characteristics of apoptosis were observed in the cancer cells. MTT assay results showed no significant reduction in normal cell viability in every time point of treatment.

**Conclusion:** PJE induced specific cytotoxic effect and morphological changes in HCT-116 cancer cells as compared to CCD-841 normal cells. Further studies should be conducted to determine the detailed mechanisms by which PJE induced apoptosis in HCT-116 colorectal cancer cells to uncover its potential application as an adjunct therapy against colorectal cancer.

**Keywords:** Colorectal cancer; pomegranate juice extract; cell-viability assay