

News & Comments

Zey: A Potential Anticancer Agent to Heal Colon Cancer

Tao Pan

Colorectal Carcinoma (CRC) is the leading cause of death in both men and women, and it is the third most common carcinogenesis worldwide. In pathogenesis, the general characteristics of cancer growth include genetic alterations and changes in apoptotic signalling, which provide an approach to curative goals. NF- κ B is a critical regulator of vital cell functions such as cell survival and proliferation. In control cells, NF- κ B is tightly regulated, whereas, in tumour cells, it is constantly pushed to high levels. NF- κ B activation in tumour cells, in particular, has been confirmed in multiple papers as one of the main causes of resistance to therapy. Zey, on the other hand, has the potential to be toxic to cancer cells while being less harmful to control cells.

Previous research has shown that Zey has a significant influence on tumours, including gastric and prostate cancer. To the best of our knowledge, there is currently no evidence of Zey arbitrated apoptosis, inflammation, or cell proliferation in colon cancer cells. As a result, the current study evaluated Zey's inhibitory qualities on colon cancer inflammation, apoptosis, and cell proliferation, as well as the NF- κ B pathway's associated mechanisms.

The study took place in the Digestive Endoscopy Room in the Outpatient Department, Yantai Yuhuangding Hospital, Shandong and Department of General Surgery, Zhangjiagang Traditional Chinese Medicine Hospital Affiliated to the Nanjing University of Chinese Medicine, Zhangjiagang, China. Sigma Aldrich provided Zeylenone (Zey), DMSO, DMEM, FBS, PBS, Rhodamine-123 (Rh-123), Acridine orange (AO), Hoechst33342, and MTT. HCT116 cells were seeded in RPMI media containing streptomycin (100 mg mL⁻¹), fetal bovine serum (10%), and penicillin (100 U mL⁻¹) in a humidified atmosphere of 5% CO₂ at 37 degrees Celsius. In all of the tests, semi-confluent cells were treated with varying doses of Zey for 24 hrs. The DCFH-DA staining method was used to assess the ROS state in HCT116 cells. The DCFH-DA is a non-fluorescent cell-permeable probe that has been implicated as a source of intracellular oxidant production.

Concerning the enlarged dosage of Zey (5, 10, 15, 20, 25, and 30 M) management, there is a reduction in cell viability when compared to control cells. In Zey-treated HCT116 cells, dose-dependent growth inhibition was detected, and cell viability was dramatically reduced after 24 hrs of Zey incubation. Control cells were exposed to a modest amount of ROS in this study, whereas Zey (10 and 15 M) treated cells significantly increased ROS production in HCT116 cells. Apoptosis was one of the outcomes of one of the various techniques for modifying mitochondrion membrane potential. The Mitochondrial Membrane Potential (MMP) was studied using Rhodamine 123, a cationic fluorescent



dye. The densitometric analysis demonstrated that the fold changes were dose-dependent

According to the findings, Zey significantly reduced cell growth and viability while also inducing apoptosis in HCT116 cells, which is consistent with previous research. Zey inhibits cell proliferation and promotes apoptosis in cervical cancer cells by lowering MAPK/ERK and PI3K/AKT/mTOR signalling levels.

Though cancer cells can avoid these tightly controlled cell death mechanisms by controlling pro-apoptotic or anti-apoptotic mediators, the mitochondrial (intrinsic) pathway is one of the most significant apoptosis types of machinery. As a result, inducing apoptosis in carcinoma cells is a critical step in cancer treatment. Members of the caspase protein family are important apoptotic molecules. Specifically, caspase-8, caspase-9, and caspase-3 are important molecules involved in the initiation of cancer. Overall, the findings showed that Zey inhibited HCT116 cell growth, increased apoptosis, and decreased inflammatory response markers. Furthermore, Zey induces oxidative stress, resulting in increased ROS production, loss of MMP, and morphological abnormalities in HCT116 cells, resulting in increased death of HCT116 cells in a dose-dependent manner. Zey could be a potential anti-cancer agent for the treatment of colon cancer, based on the findings.

JOURNAL REFERENCE

Yu, Z., Wujimu, J. Guo, W. Li and J. Tian, 2022. Zeylenone from *Uvaria grandiflora* Roxb. induces apoptosis in colon cancer cells through suppression of NF- κ B signalling. *Int. J. Pharmacol.*, 18: 190-198.

KEYWORDS

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