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Cytotoxicity effect of Ionic Liquid - Graviola Fruit (*Annona muricata*) extract to Human Colon Cancer (HT29) Cell LinesDADDIOUAISSA D.^{a,b}, AMID A.^b, KABBASHI N.A.^a, ELNOUR A.A.M.^{a,b}, EPANDY M.A.K.B.S.^c[Save all to author list](#)^a Biotechnology Engineering Department, Kulliyyah of Engineering, Jalan Gombak, 53100, Kuala Lumpur, Malaysia^b International Institute for Halal Research and Training (INHART), International Islamic University Malaysia, Jalan Gombak, 53100, Kuala Lumpur, Malaysia^c Adikafirdaus Resources, Lot 24, Jalan Klebang Selatan, 2/5 Kampung Tersusun, Batu 6 Klebang Selatan, Ipoh, 31200, Perak, Malaysia[Abstract](#)[Author keywords](#)[Funding details](#)**Abstract**

The present study aimed to investigate the anti-proliferative effect of the ionic liquid-Graviola fruit (IL-GFE) extract on colon adenocarcinoma (HT29) cell lines and their kinetics behaviour to assess the Graviola fruit potential as a therapeutic alternative in cancer treatment. The phytoconstituents content of IL-GFE was identified using GC-TOFMS apparatus and measured its cytotoxicity on HT29 by tetrazolium bromide. Then the cytokinetic behaviour of the treated HT29 cells with IL-GFE was illustrated using the cells' growth curve. Besides, the cell cycle phase perturbation for the treated HT29 was applied using a flow cytometry technique. Qualitative identification of phytoconstituents of IL-GFE showed that Graviola fruit contains acetogenins, alkaloids, flavonoids, tannins and saponins compounds. IL-GF extract displayed a cytotoxicity effect on HT29 cells with the IC50 value of 10.56 µg/mL, while Taxol showed an IC50 value of 1.22 µg/mL. IL-GFE also decreased the cell generation number from 3.93 to 2.96 generations compared to Taxol-treated cells 2.01 generations. The microscope observation of the HT29 cells treated with the crude IL-GFE displayed loss of density and cell detachment. The extract's growth inhibition was related to the cell cycle arrest at the G0/G1 phase. IL-GFE inhibited colon adenocarcinoma HT29 cells' proliferation and affected their kinetic behaviour by lowering cell viability, inducing apoptosis, and arresting the cell cycle at the G0/G1 phase. © 2021, IIUM Engineering Journal. All Rights Reserved.

Author keywordscell cycle; colon cancer; flow cytometry; GC-TOFMS; Graviola (*Annona muricata*); growth kinetics; ionic liquids

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