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Nanoparticles loaded with 5-Fluorouracil, Leucovorin and Bovine Lactoferrin as drug delivery carriers

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Encapsulation of drugs into nanoparticles (NPs) has become a promising approach for improving the efficacy of antitumor drugs. This study evaluates the cytotoxic effect of nanoformulated antitumor drug 5-fluorouracil (5-FU), alone and combined with leucovorin (LV) or iron saturated bovine lactoferrin (Fe-bLf) by, encapsulating into FDA approved biodegradable polymer poly ε-caprolactone (PCL) NPs. The spherical NPs were 200-300 ± 2.9 nm in size and had drug loading capacities of 90% (5-FU-PCL), 60% (5-FU-LV-PCL) and 80% (5-FU-Fe-bLf-PCL). Drug release of 5-FU and LV after 96 h reached 98.6 % and 99.89%, respectively; Fe-bLf release was 82.28% after 96 h. Both MTT and TUNEL assay results showed that the multi-combinatorial NPs had cytotoxicity as high as 97% and could induce apoptosis in human colon cancer cell lines (Coca-2 and SW480), but had no effect on normal FHs 74 Int cells. These findings highlight the novelty and promise of this drug delivery system, and the results warrant further evaluation in suitable animal model for its future clinical applications.

Biography

Maysaa Ch Al Mohammedawi has completed her MSc and PhD in Medical Biotechnology from the Department of Biotechnology at Al Nahrain University, Baghdad, Iraq. She became a faculty member and group leader of Medical Biotechnology research over there. She worked on molecular analysis of infectious disease, studies on the virulence factors of the pathogens, and screening anticancer agents among bacterial components. In 2012, she was awarded MoHER (Iraq) career development fellowship. Recently, join the IIE-SRF (US) fellowship at School of Medicine, Deakin University, Australia. Her studies focus on improving the in vitro drug delivery system of antitumor agents toward colon cancer.

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