

Joint Event on

GLOBAL PHARMACOVIGILANCE AND ADVANCED PHARMACY

 July 16-17, 2018 Sydney, Australia

LHRH-modified curcumin-loaded polymeric micellar formulation effect on colorectal cancer cell lines *in vitro*

Ghada Mohamed Rady Aboueid and Pegah Varamini
The University of Sydney, Australia

The overexpression of Luteinizing Hormone Releasing Hormone Receptors (LHRH-R) on Colorectal Cancer (CRC) gives the opportunity to use LHRH peptide as a potential targeting agent in CRC. Curcumin is known for its *in vitro* chemotherapeutics, chemo-preventive effect against variety of types of cancer including CRC. However; its therapeutic potential is compromised due to its limited water solubility and low metabolic stability. Curcumin-loaded polymeric micellar Nanoparticles (Cur-NP) were developed aiming to enhance the water solubility and therapeutic potential of curcumin. To actively target the nanoparticle to CRC tissue, the surface of the nanoparticles was functionalized using LHRH peptide analogue. The nanoparticles' cytotoxicity on Caco-2 and HCT-116 colon cancer cell lines was examined using MTT and live cell imaging by IncuCyte ZOOM. The natural fluorescence of curcumin allowed the detection of the cellular uptake of the formulation using Confocal Laser Scanning Microscopy (CLSM) and IncuCyte® ZOOM. Furthermore, using a new approach the uptake of LHRH-modified and unmodified nanoparticles were quantified using IncuCyte® ZOOM software. The results showed that LHRH-modified nanoparticles had a significantly higher uptake ($P=0.0001$) and better cytotoxicity ($P<0.0001$) compared to the unmodified nanoparticles. Our preliminary investigations suggest that this new formulation is a promising drug delivery system for targeted therapy of colon cancer.

Biography

Ghada Aboueid is a researcher in The University of Sydney, Australia. Her research focuses on targeted nano-particles and current research on cancer cells.

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