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In vitro assay of targeted drug delivery platform based on ZIF-67 nanocarrier containing curcumin on MCF-7 cells

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The targeted delivery of anti-cancer drugs exclusively to tumor cells presents an appealing strategy as it amplifies the therapeutic effectiveness compared to non-targeted medications [1]. To enhance the cellular uptake of chemotherapeutic agents, nanoscale delivery systems incorporating polyethylene glycol (PEG) as a surface covering, along with aptamer-conjugated nanoparticles capable of specifically binding to proteins found on the surface of tumor cells, have emerged as promising solutions. In this study, the Epithelial cell adhesion molecule (EpCAM), which is commonly overexpressed in solid cancers and has recently been identified as a marker for cancer stem cells, was utilized. Ultimately, The ZIF-67 pnanoparticles encapsulating curcumin (Ccm@ZIF-67@PEG@EpCam NPs) were fabricated in-vitro environment and characterized by XRD, SEM, TEM, DLS, TGA and BET methods [2]. Then its release was investigated at two pH of 5.4 citrate buffer and 7.4 saline phosphate buffer. Finally, the cytotoxicity of the synthetic nanoplatform was evaluated by MTT assay on human breast cancer cell line (MCF-7) [3].

Keywords: polyethylene glycol, aptamer, nanoparticle, Epithelial cell adhesion molecule, Zeolitic imidazolate framework-67

References

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