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Decrease Doxorubicin resistance in breast cancer cell line by anti-FOXM1 aptamer

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The transcription factor Forkhead box M1 (FOXM1) is a key regulator of cell proliferation and is over-expressed in many forms of primary cancers, leading to uncontrolled cell division and genomic instability. FOXM1 is the top-ranked survival-associated transcription factor in patients with triple-negative breast cancer. Previous studies showed, silencing FOXM1 expression led to breast cancer cells to become more sensitive to Doxorubicin (Dox). The aim of this study was an improvement of therapeutic efficacy of Doxorubicin by co-delivery of FOXM1 and AS1411 aptamers in the liposomal formulation. The synergist effect of encapsulated aptamers in liposomes and Doxorubicin was studied by MTT and Annexin PI test. Combination of FOXM1 aptamer and Doxorubicin significantly improved therapeutic efficacy of Doxorubicin and lessened the required amount of Doxorubicin. The results of the MTT assay exhibited that combination therapy significantly decreased cell viability in MDA-MB-231, MCF-7, and 4T1 cells compared to CHO cells, which significantly preserved their viability. The Annexin PI test also showed FOXM1 aptamer increases apoptosis effect of Doxorubicin. *In vivo* findings confirmed that synergistic combination of FOXM1 aptamer and Dox enhanced antitumor effectiveness and reduced toxicity toward nontarget cells, opening up new insights into cancer treatment.

Biography

Alia Moosavian is an assistant professor of pharmaceutical nanotechnology at Mashhad University of medical science. she completed her PhD and Pharm.D at Mashhad University of medical science. Her research interests lie in the area of target delivery in cancer treatment, liposomal formulations, and design aptamers against new targets. Her secondary field is designing formulation to topical treatment of dermal diseases.

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