عنوان مقاله:

Targeted delivery of doxorubicin and therapeutic FOXM۱ aptamer to tumor cells using gold nanoparticles modified with AS۱۴۱۱ and ATP aptamers

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نویسندگان:

Aref Abdollahzade - *School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran*

Hoda Rahimi - *School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran*

Elnaz Yaghoobi - *Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran*

Mohammad Ramezani - *Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran*

Mona Alibolandi - *Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran*

Khalil Abnous - *Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran*

Seyed Mohammad Taghdisi - *Targeted Drug Delivery Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran*

خلاصه مقاله:

Objective(s): A targeted delivery platform was prepared to co-deliver both doxorubicin (Dox) as an anticancer drug and FOXM۱ aptamer as a therapeutic substance to breast cancer cells (۴T۱ and MCF-۷) to reduce Dox side effects and increase its therapeutic efficacy. The targeted system (AuNPs-AFPA) consisted of FOXM۱ aptamer, AS۱۴۱۱ aptamer (targeting oligonucleotide), ATP aptamer, and gold nanoparticles (AuNPs) as a carrier.Materials and Methods: AuNPs were synthesized by reduction of HAuCl۴. Next, after pegylation of ATP aptamer, FOXM۱ aptamer-PEGylated ATP aptamer conjugate (FPA) was prepared. Then, the AS۱۴۱۱ aptamer and FPA were exposed to the AuNPs surface through their thiol groups. Subsequently, Dox was loaded into the complex to form a targeted therapeutic complex.Results: The data of the MTT assay displayed that the targeted complex could remarkably reduce cell viability rate in target cells due to the overexpression of nucleolin on their cell membranes compared to nontarget cells, showing the targeting ability of AuNPs-AFPA-Dox. The in vivo antitumor effect confirmed that AuNPs-AFPA-Dox was capable of remarkably diminishing tumor growth relative to the free Dox in mice bearing ۴T۱ tumor cells. Conclusion: The results confirmed that the targeted system improved the therapeutic effect by loading high amounts of Dox alongside the presence of the therapeutic effect of FOXM۱ aptamer. Finally, it can be concluded that AuNPs-AFPA-Dox by enhancing antitumor effectiveness and reducing toxicity toward non-target cells, can be used

potentially as an effective strategy for the treatment of breast cancer.v

کلمات کلیدی:

Aptamers, Antineoplastic agents, Cell Survival, Metal Nanoparticles, Nucleolin, Doxorubicin