

عنوان مقاله:

Green synthesized silver nanoparticles using *Rhazya stricta* extract for delivery of HDAC inhibitor panobinostat in MDA-MB-231 breast cancer cell line

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خلاصه مقاله:

Objective(s): Concerns regarding increased breast cancer cases worldwide have spurred interest in the discovery of novel approaches to overcome this deadly disease. Although several treatment strategies have been developed to treat breast cancer including chemotherapy, an efficient drug delivery system remains a challenge. Here, we study the drug distribution and boosting the efficiency of Panobinostat, a histone deacetylase inhibitor, by using silver nanoparticles as a controlled drug delivery system. Materials and Methods: Green synthesis of silver nanoparticles, as nanocarriers for drug delivery was synthesized by using *Rhazya stricta* extract and loaded with the drug. These drug-loaded nanoparticles were characterized by UV-vis spectroscopy, XRD, FTIR, SEM, and EDX techniques. Results: The AgNPs had an average size of 20 nm and were stable over a period. The evaluation of drug encapsulation effectiveness and drug release capacity revealed 56% encapsulation efficiency and sustained drug release. The kinetics study of drug release showed the first-order reaction which means that drug concentration is proportional to drug release. The MTT assay showed that drug-loaded AgNPs had a potent and dose-dependent anticancer activity on the breast cancer cell lines (MDA-MB-231). Conclusion: As the successfully green synthesized Panobinostat-AgNPs were stable and exhibited increased in vitro anticancer activity compared with free Panobinostat, our data demonstrate that the combination of AgNPs with Panobinostat improves the drug's long-term viability, effectiveness, and active targeting as a potential targeted therapeutic molecule for the treatment of cancer. To strengthen the utilization of this combination therapy in cancer therapy trials, further research is warranted in vivo.

کلمات کلیدی:

Breast Cancer, Drug Delivery, Nanotechnology, Panobinostat, Silver nanoparticles

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