Documents

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Chitosan: A versatile bio-platform for breast cancer theranostics

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Abstract

Breast cancer is considered one of the utmost neoplastic diseases globally, with a high death rate of patients. Over the last decades, many approaches have been studied to early diagnose and treat it, such as chemotherapy, hormone therapy, immunotherapy, and MRI and biomarker tests; do not show the optimal efficacy. These existing approaches are accompanied by severe side effects, thus recognizing these challenges, a great effort has been done to find out the new remedies for breast cancer. Main finding: Nanotechnology opened a new horizon to the treatment of breast cancer. Many nanoparticulate platforms for the diagnosis of involved biomarkers and delivering antineoplastic drugs are under either clinical trials or just approved by the Food and Drug Administration (FDA). It is well known that natural phytochemicals are successfully useful to treat breast cancer because these natural compounds are safer, available, cheaper, and have less toxic effects. Chitosan is a biocompatible and biodegradable polymer. Further, it has outstanding features, like chemical functional groups that can easily modify our interest with an exceptional choice of promising applications. Abundant studies were directed to assess the chitosan derivative-based nanoformulation's abilities in delivering varieties of drugs. However, the role of chitosan in diagnostics and theranostics not be obligated. The present servey will discuss the application of chitosan as an anticancer drug carrier such as tamoxifen, doxorubicin, paclitaxel, docetaxel, etc. and also, its role as a theranostics (i.e. photo-responsive and thermo-responsive) moieties. The therapeutic and theranostic potential of chitosan in cancer is promising and it seems that to have a good potential to get to the clinic. © 2021 Elsevier B.V.

Author Keywords

Anticancer drug; Breast cancer; Chitosan; Drug delivery; Nanoparticles; Phytochemicals

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