ABSTRACT

Triple negative breast cancer (TNBC) is an aggressive type of breast cancer, impotent to treat with chemotherapy owing to the absence of the specific receptor on the cancer cell surface. The aim of the present work was to analyze the ability of c-KIT mAb anchored immunonanoscaffold bearing Paclitaxel (PTX) to specifically bind to the c-KIT protein on the TNBC cells. The PTX-PLGA-PEG nanoscaffold was prepared by the double emulsification method. The prepared nanoscaffold was covalently conjugated with c-KIT monoclonal antibody by crossing linking. The nanoscaffold was then characterized for the morphology, particle size and entrapment efficiency, zeta potential and drug release behavior. The monoclonal antibody anchoring was confirmed by SDS-PAGE electrophoresis and quantified by Bradford protein assay. The cytotoxicity of the immunonanoscaffold was analyzed by MTT assay using MDA-MB-468 cell line. The nanoscaffold cellular uptake was confirmed by fluorescence microscopy using FITC as a marker. The expressing of c-KIT gene in TNBC cells was confirmed by Western blot method and the expression of c-KIT protein was qualitatively and quantitatively measured by Polymerase chain reaction (PCR) amplified c-KIT single strand subjected to Agarose gel electrophoresis. The *in vivo* anti-tumor activity of immunonanoscaffold was determined by using BALBc mice model. The targeting efficiency was analyzed by fluorescence imaging technique. Based on the results of the study, we recommend that c-KIT antibody anchored PTX-PLGA-PEG nanoscaffold might have the ability to target the TNBC cells and improve the therapeutic action and subsidize the side effects of PTX.

Keywords:

Triple-negative breast cancer, c-KIT protein, MDA-MB 468 cells, Paclitaxel