Drug release and kinetic study of tamoxifen citrate conjugated with magnetite nanoparticle for drug delivery application

ABSTRACT

Breast cancer is affecting about 23 % of all cancers diagnosed in women. So, it is crucial to develop the treatment for breast cancer patient. Tamoxifen (TAM) has been used for treating estrogen receptor (ER)-positive breast cancer however TAM suffer from non-specific delivery to the breast cancer. TAM was introduce to magnetite nanoparticle (MNP) to increase tissue selectivity using Poly (d,l-lactice-co-glycolide acid) (PLGA-TAM-OAMNP) via oil in water emulsion and evaporation process. It was discovered that the size of the modified nanoparticle is 384 ± 17 nm while also maintaining its superparamagnetic nature. The percentage of drug loading and entrapment efficiency of TAM inside the PLGA-TAMOAMNP is around 6% and 80% respectively. Then, drug release was conducted for the next 96 hours releasing about 90% of the drug. The in vitro drug release was due to autocatalysis of PLGA.

Keyword: Magnetite nanoparticle; Tamoxifen citrate; Poly (d,l-lactice-co-glycolide acid)