113 SPECIFIC TARGETING OF HER2-POSITIVE BREAST CANCER CELL LINE (SK-BR3) USING IDARUBICIN-LOADED ANTI-HER2 IMMUNOLIPOSOME

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Cytotoxic chemotherapy drugs which are used for treating malignant cells cannot distinguish between normal and cancerous cells. This would lead to adverse side effects. Moreover, drug resistance is another major problem of the classical chemotherapy during the treatment period. Recently, various therapeutic strategies have been developed for cell-specific targeting of anti-neoplastic drugs. Among the various kinds of drug delivery systems, (immuno) liposome has attracted high attention for its unique features such as high loading capacity, lower toxicity, delivery of soluble/non-soluble drugs,

targeting and versatile structural specifications that permit easy surface decoration. Idarubicin is a semisynthetic anticancer drug that is widely used for treatment of leukemia as well as other kinds of cancers.

In this study, liposomes were covered with biocompatible polyethylene glycol (PEG) and dress up with a monoclonal antibody (mAb) Trastuzumab (Herceptin®). Trastuzumab is a humanized mAb approved by FDA for ablation of HER-2 over express cells in metastatic breast cancer. The constructed immunoliposome was loaded by Idarubicin. Shape, polarity, and size of synthesized immunoliposomes were characterized by the Atomic Force Microscopy (AFM) and Dynamic Light scattering (DLS) methods. SK-BR3 and MCF7 cell lines were used as HER2- positive and HER2-negative cells, respectively. Cell lines were treated with different concentrations of Idarubicin either in the free form or entrapped in liposomes/ immunoliposomes. After treatment, growth of malignant cells was evaluated by MTT assay.

Mean diameter and zeta potential of the prepared Idarubicin-loaded anti-HER2 immunoliposomes were 160 nm and –20 mV, respectively. Cell lines responded to Idarubicin in a concentration dependent manner. According to the obtained results, Idarubicin showed potent toxic effect on both kinds of cell lines, however; SK-BR3 cells were significantly more sensitive. In comparison, Idarubicin in the form of immunoliposome was more potent in the killing of SK-BR3 malignant cells.