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Synthesis of doxorubicin loaded and glucose/gluconic acid coated magnetic nanoparticles

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Last international statistics stated that the number of cancer patients will be more that 15 million in 2020. Depending on the location and the stages, most cancer types can be treated with applications such as surgery, radiotherapy and chemotherapy. Pharmacologically active anticancer drugs reach to tumor tissue with low specificity and dose-dependent toxicity in chemotherapy applications. These methods have some disadvantages. An anthracycline antibiotic doxorubicin which has a wide range of usage is administers to patients intravenously either alone or in combination with other drugs. It is used for treatment of breast, ovary, bladder, bronchiogenic lung, thyroid, gastric cancer, soft tissue, osteogenic and Kaposi's sarcoma, neuroblastoma, Wilm's tumor, Hodgin and non-Hodgin lymphoma, acute lymphoblastic and acute myeloblastic leukemia. Doxorubicin has many side effects such as cardiotoxicity and myelosuppression, it leads to a very narrow therapeutic index of the drug. Another important issue is unwanted drug resistance as well as these effects. At the present time, by using nano-particular drug delivery systems, it is possible to reach lower dose of drug usage and making less harmful. Under this project, primarily, α-D-glucose coated iron oxide nanoparticles were synthesized. Doxorubicin was loaded to prepared glucose coated magnetic iron oxide nanoparticles via hydrazone bond. At this stage of the formulation, obtained product will have potential for concentrating in the desired site with an external magnetic field.

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Biography

Habibe Yilmaz has completed her Msc studies in 2012 from Ege University, Faculty of Science Biochemistry Deparment and initiated her PhD studies in 2012 in the same department. She is also started to work in Helvacızade Food, Drug and Chemistry Company as a Researcher in AR & GE and Product Development Department in April 2013. At the same time, she also started to work in Ege University, Pharmacokinetic Drug Development & Research Center (ARGEFAR) as a Researcher in Biosimilar Products Department Proteomics Unit. She is a Funded Researcher in two projects about nanoparticular anticancer agent researches.

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