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## Smart drug delivery systems targeted delivery of chemotherapeutics, immunostimulators and siRNA molecules

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Advances in targeted drug delivery provide reduced side effects, longer circulation half-life and improved pharmacokinetics. Smart nanocarriers have been designed for tissue-specific targeting, triggered release and delivery of drugs to develop more efficient and safer therapeutics. These nanocarriers can serve as an intelligent system by considering the differences of tumor microenvironment from healthy tissues, such as low pH, low oxygen level or high enzymatic activity of matrix metalloproteinases. The performance of anticancer agents used in cancer diagnosis and therapy is improved by enhanced cellular internalization of smart nanocarriers and controlled drug release. Targeting, cellular internalization; controlled drug release and toxicity of smart drug delivery systems will be presented and the subject will be expanded by exemplifying various drug delivery systems including the stimulus responsive controlled release of cancer chemotherapeutics such as Doxorubicin, Bortezomib, Gemcitabine, Idarubicin; immunostimulators including Poly:IC and siRNA molecules from diverse smart nanocarriers. The efficacy of Doxorubicin, Bortezomib, Gemcitabine and Idarubicin was highly increased when loaded on magnetic chitosan nanoparticles, PAMAM dendrimer, PHB, PEG and dextran coated magnetic nanoparticles as compared to free drug. The release of Doxorubicin, Bortezomib and Gemcitabine was pH dependent from magnetic chitosan nanoparticles. Co-delivery of Doxorubicin and Poly:IC as loaded on PAMAM dendrimer coated iron oxide nanoparticles was also more efficacious than free drugs *in vitro*. Targeted silencing of gene expression can be accomplished with chitosan coated and PAMAM dendrimer coated magnetic nanoparticles on cancer cell lines.

### Biography

Gozde Unsoy has received her PhD degree with her thesis studies regarding to the targeted drug delivery systems on cancer therapy from Middle East Technical University, Turkey. She has won the Best Thesis Award from METU. Her research interests cover the synthesis and application of various smart drug delivery systems. She is the author and co-author of over 20 research papers indexed in SCI. She has been working on diverse projects including *in vitro* and *in vivo* applications of targeted drug delivery systems and biosensors prepared via MEMS as Post-Doctoral Researcher in METU.

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