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## 5TR1 aptamer-PEGylated liposomal doxorubicin enhances cellular uptake and suppresses tumor growth by targeting the overexpressed MUC1 on the surface of cancer cells

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Employing targeting ligands with high affinity to tumor receptors is an important strategy to increase treatment efficacy. The use of aptamers as targeting agent is increasingly prevalent in drug delivery systems. Mucin1 (MUC1) is a glycoprotein that is over-expressed on the surface several cancer cells and plays important role in metastasis and invasion. 5TR1-aptamer is a DNA aptamer, which targets MUC1 receptors. We investigated the anti-tumor activity and therapeutic effectiveness of 5TR1-aptamer-PEGylated liposomal Doxorubicin (PLD) delivery system in C26 tumor-bearing mice. The *in vitro* experiments demonstrated enhanced cytotoxicity and cellular uptake of PLD at the presence of 5TR1 aptamer into MUC1+C26 cell line. Biodistribution study indicated that aptamer conjugation increased tumor accumulation of PLDs. Pharmacokinetic analysis showed despite higher clearance rate, selective delivery of doxorubicin to tumor tissue was increased in 5TR1- Doxil group. In C26 bearing tumor mice, treatment with 5TR1-Doxil exhibited significant deceleration in tumor growth and enhanced survival. The results suggested that 5TR1 aptamer is promising ligand for active targeting which improves therapeutic efficiency of PLD in cancer therapy.

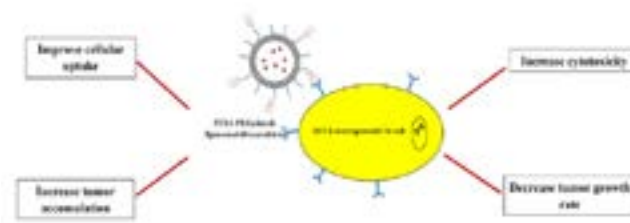


Figure: Targeting liposomal doxorubicin with 5TR1 aptamers increases the *in vitro* cellular uptake and cytotoxicity of formulations, improves tumor accumulation and decelerates tumor growth in mice bearing MUC1-overexpressing C26 colon carcinoma.

### Biography

Alia Moosavian is an Assistant Professor of Pharmaceutical Nanotechnology at Mashhad University of Medical Sciences. Her work focuses specifically on the drug delivery for cancer treatment. Her main areas of research interest are liposomal drug delivery systems and aptamers as new targeting agents for drug delivery.

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