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Mini Review

## Pegylated Drug Delivery Systems

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### INTRODUCTION

Medical science is facing issues in these days to have a proper grip over providing adequate treatment to the cancerous cells and psychosis. To address this, issue use of nanoparticle has been introduced into medical science. Nanoparticles are getting conjugated with the chemotherapeutic drugs so that it can get administered into the exact location. Similarly, it will help to detect the disease earlier sometimes<sup>1-18</sup>. Use of nanoparticle sometimes assists in making the chemotherapeutic drug easily passable through the intercellular membrane. Therefore, the use of nanoparticles of size 1 to 500 nm has been seen as an increase nowadays.

To solve different issues related to cancer treatment, various way-outs are invented. Every single way-out are designated in different methods of preparation of chemotherapeutic drugs. The administration process of those drugs is different depending on the type of cancers. It has been found that malignant brain tumors are fatal diseases among the global population. The diagnosis, management, and treatment of the disease are much tighter, so nanoparticles are mainly used with chemotherapeutic drugs. Apart from that, multidrug resistance is another reason that restricts chemotherapeutic drugs to work correctly. Along with this, lipid nanoparticles are used conjugating with T7 peptides. This helps the dual modulation process of Bcl-2 and Akt-1 in cervical and lung carcinoma<sup>19-34</sup>.

Sometimes, the lipid nanoparticles get loaded by the antisense oligonucleotides that mainly get used into the treatments of lung cancer. In this procedure, the oligonucleotide G3139-GAP is synthesized by 2-O-methylation of the nucleotide chain in its 5 and 3 number

end. This G3139-GAP loaded with lipid nanoparticles gets transformed into A549 lung cancer cell which is very much useful for therapeutic efficacy. Doxorubicin (DOX) is another drug that helps to treat malignant tumor patients. DOX needs to get conjugated with any peptide-based ligand to get delivered adequately into the exact location<sup>35-51</sup>.

It is a unique form of doxorubicin with polycoated liposome. Its toxicity level is opposite than the doxorubicin toxicity.

Use of nanoparticles along with chemotherapeutic drugs for the treatment of brain tumor not only makes it easier for the medicine to pass the cellular membrane properly but also helps to minimize the effect of cytotoxicity that even cause the death of the patient. In the case of T7 peptide conjugated lipid nanoparticles, the antisense oligonucleotides (ASOs) modulates the target genes selectively. This selective targeting prevents mRNAs from getting transformed into the protein that assists to have efficiency in preclinical studies of the diseased part. As a result of conjugation between G3139-GAP, lipid nanoparticles show stability in serum and colloid. Also, the encapsulation capacity of the LNP gets improved. Apart from this, the G3139-GAP- LNP conjugation inhibits the growth of the tumor that prolongs the survival of the patients. It encourages hindering the excessive spread of the tumor cells into the human body<sup>19,46-51</sup>. Use of DOX for the treatment of malignant tumors is the most famous cancer treatments available in medical science. To get the readily accessible peptide-based ligands the use of antibodies, small molecules and proteins are mostly used. The primary cause of using those materials is the easy availability, low cost and efficient resistance capability of them. Apart from that, these ligands get conjugated readily with Doxorubicin (DOX).

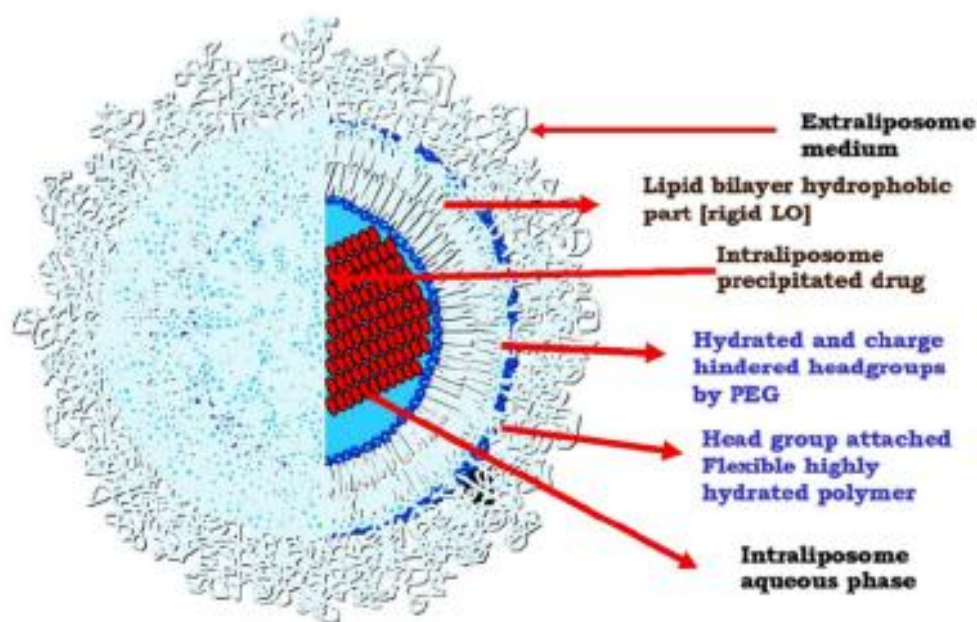


Figure 1: Pegylated Liposomal Doxorubicin (DOX)<sup>4</sup>

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