

A Note on Nanoparticle Drug Delivery

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DESCRIPTION

There are numerous reasons for utilizing nanoparticles for therapeutic and diagnostic agents, as well as advancement of drug delivery, is crucial and much important. It is to be noticed that the efficacy of the drug in reaching the targeted tissue is directly linked to particle size (excluding intravenous and solution) [1]. Due to their small size and large surface area, drug nanoparticles show increase solubility and thus enhanced bioavailability, additional ability to cross the blood brain barrier (BBB), enter the pulmonary system and be absorbed through the tight junctions of endothelial cells of the skin. Specifically, nanoparticles made from natural and synthetic polymers (biodegradable and non-biodegradable) have received more attention because they can be customized for targeted delivery of drugs, improve bioavailability, and provide a controlled release of medication from a single dose through adaptation the system can prevent endogenous enzymes from degrading the drug [2]. Secondly, the development of new drug delivery systems is providing another advantage for pharmaceutical sales to branch out. Innovative drug delivery is driving the pharmaceutical companies to develop new formulations of existing drugs. While these new formulations will be beneficial to the patients, it will also create a powerful market force, driving the development of even more effective delivery methods [3].

The main and useful advantages of nanoparticles in pharmaceutical drug delivery is stability under various pH, it acts as better drug carrier as they can easily pass through the Blood Brain Barriers (BBB), the nanoparticles have capacity to pass and sustain through both hydrophilic and hydrophobic conditions, it can be easily administered in various routes like oral, IV (Intra Venous), subcutaneous, etc. nanoparticles drugs can also be easily inhaled. The main role nanoparticles are they have good control on drug release when administrated in the cases of sustained or controlled release. They also have other advantages like excellent bioavailability, reduction in dosing frequency [4].

Novel and innovative drug delivery systems have numerous benefits when compared to the conventional multi dosage therapy. For past

50 years, use nanotechnology was only considered as the one of the research interests in the field of pharmaceuticals but not given pure and special importance and also not implemented for the use of drug delivery. Nanoparticles can provide prominent advantages and applications in terms of stability, specificity, drug carrying capacity, controlled release, route of administration and the ability to deliver the drug both hydrophilic and hydrophobic drug molecules. One can design a well sophisticated nondrug delivery system to avoid the problems that come under conventional drug therapy [5].

CONCLUSION

With the help of Nano drug delivery we can reduce the amount of drug that can be used and this can also increase the bioavailability of the drug. Nanoparticles are known to have less side effects and adverse effects with low rate of toxicity conditions. There has been extensively studied on field of Polymeric nanoparticles that can act as particulate carriers in both pharmaceutical and medical fields, as they can be used as promising drug delivery systems, as a result of their controlled and sustained release properties, subcellular size, biocompatibility with tissue and cells.

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