Chapter 15
An Overview of Therapeutic Applications

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ABSTRACT

Over the last few years' great advances have been made on the development drug delivery systems for different purposes for targeting the diseased conditions. Novel drug delivery originates from polymers or associated with some devices is generally related with the emergence of novel characteristics. These changes are what eventually comprise the value of drug delivery system and Novel drug delivery system. Novel properties become existed without making new materials. Novel drug delivery system comparable to traditional system, following Targeted Drug Delivery System (TDDS) is also called targeting drug system. A new drug delivery system makes the drugs densely gather pathological-change structures, and has an improved healing effect and less toxic side effects. The drugs can improve the strength of pharmacological action and reduce the bad effect all over the body, for they release in the target organs.

INTRODUCTION

The method of treating infection and illness as we enter in next era twenty first century includes the subsequent forms of treatment a. surgery, b. psychotherapy, c. physical therapy, d. radiation and e. chemo or pharmacotherapy. The most commonly used is treatment method (Banker, Siepmann; Rhodes, 2002).

Novel drug delivery system whether it originates from polymers or associated with some devices is generally related with the emergence of novel characteristics. The most extensive results of their minute size, dosage form or targets are without distrust the change in their final properties. Next in significance are changes in other properties, both physical and chemical. These changes are what eventually comprise the value of drug delivery system and Novel drug delivery system. Novel properties become existed without making new materials.

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Role of Targeted Drug Delivery System (TDDS)

Novel drug delivery system comparable to traditional system, following Targeted drug delivery system (TDDS) is also called targeting drug system'. A new drug delivery system makes the drugs densely gather pathological-change structures, and has an improved healing effect and less toxic side effects. The drugs can improve the strength of pharmacological action and reduce the bad effect all over the body, for they release in the target organs (Chaturvedi et al., 2011).

Carrier-mediated drug delivery has emerged as a powerful line of attack for the action of various pathologies. The therapeutic index of conventional and novel drugs is enhanced via the increase of specificity due to target of drugs to a particular tissue, cell or intracellular segment, the control over release kinetics, the protection of the active agent or a combination of the above. Nanoparticles (NPs) were proposed as drug carriers over 30 years ago and have received increasing attention since, mainly due to their stability, improved loading capabilities and control over physicochemical properties. The unique pathophysiology of solid tumors allows passive accrual of NPs at these sites upon intravenous injection. Furthermore, stealth NPs with long circulation times is better organized in reaching tumor tissue.

Drug activity is a result of molecular interaction(s) in certain cells; it is therefore easily deduced that it is essential for the drug to reach one way or another site of action following administration (oral, intravenous, local, transdermal, etc.) at sufficient concentrations. The systematic field dealing with this issue is known as drug delivery and has fundamentally the following aim: to deliver the drug at the exact place, at the right concentration for the right period. This is not possible by simply selecting a suitable administration route, or if such administration causes patient uneasiness, strategies based on the involvement of the drug with a carrier. Additional motivations for such approaches include the reduction of required resources for therapy, accomplished by an increase of the drug's therapeutic index and the prevention of frequent, unpleasant or expensive treatments.

Role of Drug Delivery System Other than TDDS

Drug delivery systems, ranging from implantable electronic devices to single polymer chains, are required to be well suited with processes in the body (biocompatibility) as well as with the drug to be delivered. DDS alter the biodistribution and pharmacokinetics of the associated drug: that is the time-dependent proportion of the administered dose in the different organs of the body. Furthermore, obstacles arising from little drug solubility, degradation (environmental or enzymatic), fast clearance rates, non-specific toxicity, in ability to cross biological barriers, just to mention a few, may be dealing by drug delivery system. Overall, the challenge of increasing the therapeutic outcome of drugs, with a simultaneous minimization of side effects, can be tackled from side to side-appropriate design and engineering of the DDS, in a case-to-case manner (Kelner, 2005; Mann et al, 2001; Pathak et al, 1992).

Even the most difficult part in all Drug delivery systems development actions, the accomplishment of release of the drugs, can be controlled suitably. This is true of both Drug delivery systems and novel drug delivery systems. Because of the extensive history of development, there has been profusion of time to develop perfect Drug delivery systems to novel one. One decisive finding opened up completely novel strategies for both traditional systems and Drug delivery systems the make use of polymers, frequently consisting of organic molecules. Such interesting molecules not only support the delivery systems by their kinetic and size-limiting function; they also make the drugs soluble in solvents, depending on the chemical character of the delivery systems.