Journal of The Gujarat Research Society
ISSN: 0374-8588
Volume 22 Issue 1, January 2020

A Critical Review on Drug Delivery Systems

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ABSTRACT: ***Excipients are currently used in novel dosage formulations to perform unique roles because of developments in drug delivery technology and, in some cases, they directly or indirectly affect the degree and/or rate of drug release and drug absorption. Recent developments in the use of plant-based and natural goods require that synthetic additives be substituted by natural ones. The whole world today is profoundly interested in natural medicines and excipients. These natural materials have many advantages over synthetic materials as they are chemically inert, non-toxic, less costly, biodegradable, and readily available, increasing the shelf life of the product. This paper offers an overview of natural excipients used in traditional forms of dosage as well as innovative systems of drug delivery. As non-active ingredients that are mixed with therapeutically active compound(s) to form drugs, pharmaceutical excipients can be identified. The portion which is not an active compound is considered to be an excipient. Excipients have a more and more practical and important impact on the action and efficacy of the drug product. The variability of active compounds, excipients and processes are obvious elements of the variability of the product.***

KEYWORDS: Biological, Drug, Materials, Product, Pharmaceutical.

INTRODUCTION

The term excipient comes from the Latin word, excipients, which means getting, gathering, and taking out. Formulation efficiency depends on the active pharmaceutical ingredient (API), the methods of processing and the excipients used[1].

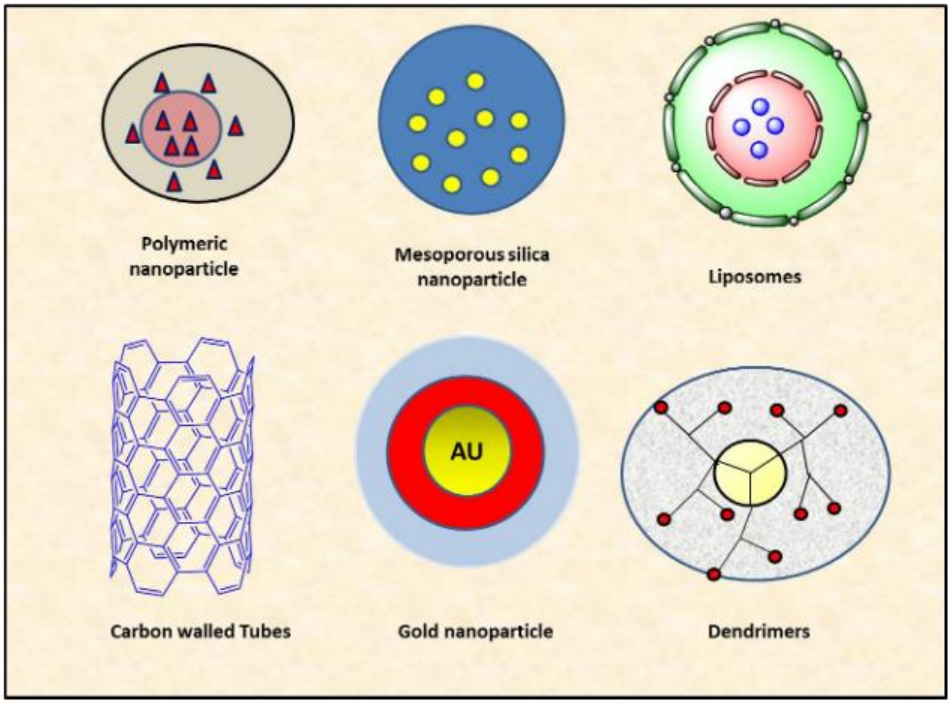

Figure 1: Illustrates the types of nanocarriers for novel drug delivery system[2]**.**

These excipients contribute to the API's efficiency in a great way and sustain the product's protection and efficacy. Excipients are used mainly in traditional dosage types such as tablets and capsules as diluents, binders, disintegrates, adhesives, glidants and sweeteners. Since the establishment of toxicity and regulatory authority approval poses a problem with synthetic excipients, researchers are showing more interest in herbal excipients of late. Compared to their synthetic counterparts, the downside presented by heavy metal contamination often associated with herbal excipients is superseded by their lack of toxicity, easy availability, and economic considerations in the pharmaceutical industry. In food, medications, and cosmetics, today's customers are searching for natural ingredients as they feel that something natural would be better and free of side effects[3].

The common view that excipients are inert and do not exert any therapeutic or biological activity or alter the biological action of the drug substance has shifted and it is now accepted that the rate and/or degree of absorption of a drug may be potentially influenced by excipients. They have a significant role to play in pharmaceutical formulation, because herbal excipients are non-toxic and compatible. This article therefore offers an overview of natural excipients used in traditional dosage types as well as innovative drug delivery systems[4].

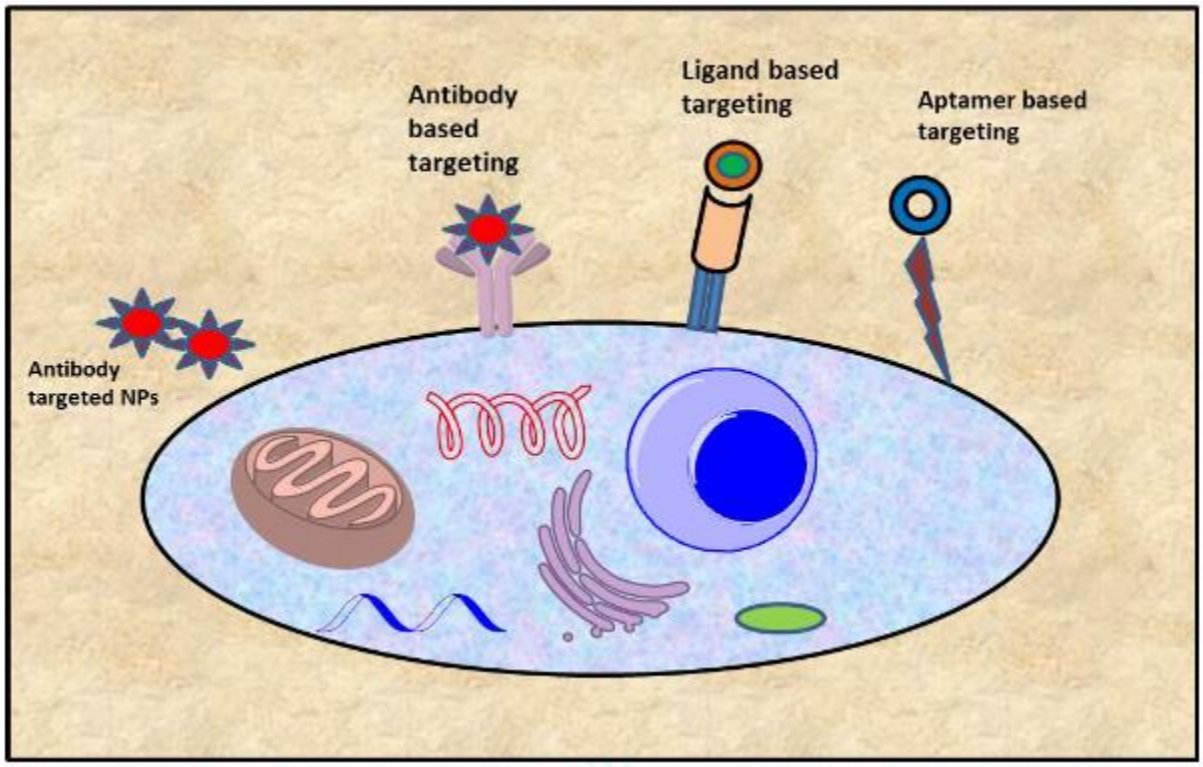

Figure 2: Illustrates the targeting of nanoparticle through drug delivery system[5]**.**

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In the modern world, herbal medicines are becoming more common for their use to treat a variety of diseases with less adverse effects and stronger therapeutic effects. On the other hand, certain herbal extract limitations are unstable at highly acidic pH, high first-pass metabolism, etc. may result in little or no therapeutic effect of the drug level below the therapeutic concentration in the blood. The herbal drugs are loaded into the new carriers to reduce drug degradation and extreme side effects by accruing drugs to the non-targeted region to remove certain effects (Fig. 4). The following steps were formed by phytoconstituent-loaded nanoparticles; initially, the phytoconstituent had to be extracted from the plant and then formulated into nanomaterial-loaded phytoconstituent, then this facilitated pharmacological effect in the desired shape.

DISCUSSION

Figure 3: Depicts the double emulsion solvent evaporation method[6]**.**

There are some additional benefits to the introduction of herbal extracts into novel formulating systems, such as their bulk dosing and less absorption can be solved, which is the key problem faced, attracting the attention of major pharmaceutical firms[7]. The area of applied science and technology is nanotechnology, which aims to create devices and dosage forms in the range of 1 to 100 nm[8]. The applications of nanotechnology have recently been referred to as nanomedicine for the treatment, diagnosis, monitoring and control of biological systems. Safe materials, including synthetic biodegradable polymers, lipids, and polysaccharides, have been made from

nanocarriers. Figure 1 illustrates the Types of nanocarriers for novel drug delivery system[7]. Figure 2 illustrates the targeting of nanoparticle through drug delivery system Figure 3 depicts the double emulsion solvent evaporation method.

CONCLUSION

The emphasis today is on patient compliance and there is a spurt in the growth of NDDS to achieve this goal. These can be chemically compatible with the excipients in drug delivery systems, as the herbal excipients are promising biodegradable materials. Additionally, compared to their synthetic alternatives, herbal excipients are non-toxic, readily available, and less costly. In the pharmaceutical industry, they have a great role to play. Therefore, there will be continuing interest in natural excipients in order to provide stronger materials for drug delivery systems in the years to come.

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