

Advances in Natural Polymeric Nanoparticles for the Drug Delivery

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Abstract

Natural and biodegradable polymers have been the key area for utilizing their advantages which make them a possible option for development of various drug delivery systems. The complexity of diseases and the intrinsic drug toxicity and side effects has led to an interest for development and optimization of drug delivery systems. The advancements in nanotechnology have favored the development of novel formulations which can modulate the biopharmaceutical properties of bioactives and thus improves the pharmacological and therapeutic action. The shape, size, and charge nanoscale delivery system, such as nanoparticles (NPs) are required to be investigated and changed in order to promote and optimize the formulations. The various natural polymeric NPs (PNPs) have been found to be key tool to enhance bioavailability or specific delivery to certain site of action. In this chapter, the uses of various polymeric materials for the development of NPs as drug delivery systems for various ailments have been described. The entrapment of bioactive compounds in PNPs systems is a hopeful move toward improvement of efficacy of drug toward the treatments of various diseases.

Keywords: polymeric material, drug delivery, nanoparticles, targeting

1. Introduction

The research for natural polymeric material for the advancement in the drug delivery has been a prime focused for the researchers in the last two decades. The concept of natural polymeric material is one of the frontier research areas and is being focused for the enhancing the bioavailability along with the specific/targeted drug delivery and therapeutic index for the treatment of some life threatening diseases, like cancer [1]. Polymeric drug delivery system has been used to enable the delivery of drug molecule into the body for the therapeutic action. Various polymers biodegradable and non-biodegradable origin has been widely identified and used which are accompanying various advantageous features with them. For different novel drug delivery systems development, biodegradable and bio-reducible polymers are used which make a possible choice helping delivery of bioactives.