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Editorial Open Access

Solid Lipid Nanoparticle: An Overview

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Lipids contain hydrocarbons and building blocks of cells naturally forming nano-films and nano-structures, micelles, reverse micelles, and liposomes. Solid lipid nanoparticles or lipid nanoparticles is typically spherical, electrostatically assembled from cationic liposomes and an anionic protamine-DNA complex possesses a solid lipid core matrix that can solubilize lipophilic molecules. It is used to deliver drugs and genes and micro RNA to treat retinal diseases or ocular tissues (cornea or retina) and other diseases cases such as cancer, epilepsy etc. Particulate carriers, especially solid lipid nanoparticles have evoked considerable interest, owing to the desirable properties that they impart to the substance being delivered for transcutaneous vaccination providing immunity against several types of pathogens, taking advantage of the immune components found in the skin. The success in the field of vaccination has not only relied on the type of antigen and adjuvant delivered, but also on how they are delivered. Furthermore, nanoparticles protect the antigen from degradation and allow its prolonged release, which maximizes its exposure to the immune cells. This editorial article suggesting to the researcher or reader will focus not only to the non-vesicular carriers such as cubosomes, solid lipid nanoparticles, nano-structured lipid carriers, solid in oil nanodispersions, lipoplexes, and hybrid polymeric-lipidic systems but also vesicular carriers such as liposomes, transfersomes, and ethosomes etc. The applications of these carriers in the field of transcutaneous immunization and digestive tract tumors are challenging aspects in the present scenario. Nanoencapsulation of chemotherapeutic agents within biocompatible polymeric or lipid matrices holds great potential to improve the pharmacokinetics and efficacy of conventional chemotherapy while reducing systemic toxicity. Tagging nanoparticle surfaces with specific ligands for cancer cells, namely monoclonal antibodies or antibody fragments, has provided means to target more aggressive clones, further improving the selectivity and efficacy of nanodelivery vehicles. In fact, over the past twenty years, significant research has translated into a wide array of guided nanoparticles, providing the molecular background for a new generation of intelligent and more effective anti-cancer agents. Attempting to bring awareness among the medical community to emerging targeted nanopharmaceuticals and foster advances in the field of pharmaceutical sciences. Lipid-based nanocarriers (LNC) are among the newer and interesting colloidal drug delivery systems; they show the capability to improve the local bioavailability of drugs administered by various ocular routes and, therefore, their therapeutic efficacy. Furthermore, their extreme biodegradability and biocompatible chemical nature have secured them the title of 'nanosafe carriers. The recent trends of solid lipid nanoparticles applications in biomedical and therapeutics are as follows; Progress in solid lipid nanoparticles-based drug carrier in designing of controlled or sustained drug-delivery systems of nanomedicines for cancer therapy or guided nanotherapies for digestive cancer, brain tumor, ocular gene delivery, oral drug delivery, transcutaneous immunization, enhancement of antibiotic therapy, non-Hodgkin B-Cell, and anticonvulsant therapy and many more.

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