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Editorial Open Access

Emergence in the Lipid-Based Nanostructured Systems for Optimizing Oral Delivery of Drugs

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Editorial

Since decades poor water solubility of the new chemical entities synthesized in pharmaceutical R&D has become a trivial challenge not only for the chemists but also for the formulation scientists to improve their deliverability through oral route. As these primarily exhibits low oral bioavailability as a function of poor solubility, a number of strategies including solid dispersions, inclusion complexes, supersaturated systems, co-crystals and nanocrystals, polyamorphous and co-amorphous systems are available for the purpose. However, when the drugs exhibit additional challenges like extensive hepatic first-pass effect, efflux by P-gp transporters and gut wall metabolism by Cytochrome P450 enzymes, etc., the issue remains highly thwarted for augmenting the oral bioavailability of the drugs by the aforementioned techniques. In this context, lipids and lipid-based drug delivery systems have attracted wide attention for improving the biopharmaceutical performance and oral deliverability of the drugs. These include diverse technologies categorized as vesicular and non-vesicular systems. Vesicular systems include liposomes, niosomes, transfersomes, bilosomes, while non-vesicular systems include self-nanoemulsifying systems, lipid microparticles, solid lipid nanoparticles, nanostructured lipidic carriers, lipid-drug nanoconjugates, nanolipospheres, etc. Primarily constituted of the phospholipids, lipids including medium and long-chain triglycerides, and surfactants, these lipidic formulations tend to augment the oral bioavailability by micellar solubilization and potentiating the drug absorption through paracellular, transcellular and lymphatic pathways.

Several literature reports have been published on oral bioavailability enhancement of the drugs belonging to cardiovascular, anticancer, antiretroviral, antiparkinson's, antialzheimer's drugs and many other agents employing lipid-based nanostructured systems. Owing to the immense potential for augmenting the therapeutic performance of the drugs using lipidic formulations, these have been lately transferred to clinical set-up for their low cost and ease of scalability into the industrial milieu. This has led to the existence of a score of the marketed products being translated to the pharmaceutical industries in diverse therapeutic areas. The recent investigations have demonstrated the emergence in the applications of lipidic formulations for augmenting the oral deliverability of biologicals for the purpose. The present editorial, in a nutshell, provides an overview of lipid formulations for their versatile applications in the oral drug delivery and beyond for the purpose.

In this context, I am really thankful to the OMICS publishing groups for giving me such an opportunity to write an editorial article for the upcoming issue.