

Sustained and Controlled Drug Release using Cubosomes

Prof. Shinde S. B, Dr. Abhishek Kumar Sen, Ms. Helude Chaitali Vijay
Pratibhatai Pawar College of Pharmacy, Wadala Mahadev, Shrirampur

Abstract: *Traditional drug delivery methods have been replaced by smart drug delivery systems that react to stimuli as a result of the remarkable developments in biomedical nanotechnology over the past few decades. By reacting to particular internal or external stimuli, these well-defined nanoplatfoms can increase therapeutic targeting efficacy while lowering payload toxicities and side effects, which are critical factors for improving patient compliance. Cubosomes are lipid vesicles that resemble liposomes and other vesicular structures. When a sufficient stabilizer is present, certain amphiphilic lipids form cubosomes. Self-assembled cubosomes as active drug delivery vehicles have garnered a lot of interest and attention since their discovery and identification. Cubosomes are self-assembling nanoparticles made up of certain liquid crystalline surfactant particles that are balanced between water and microstructure. Unlike regular solid nanoparticles, cubosomes are self-assembled liquid crystalline particles with a solid-like rheology, giving them special qualities of practical importance. Because of their potential benefits, which include high drug dispersal because of the cubic structure, large surface area, a relatively easy manufacturing process, biodegradability, the capacity to encapsulate hydrophobic, hydrophilic, and amphiphilic compounds, targeted and controlled release of bioactive agents, and biodegradability of lipids, cubosomes exhibit great promise in drug nanoformulations for cancer therapeutics. The most common method of preparation involves simply emulsifying a monoglyceride with a polymer, then homogenizing and sonicating the mixture. They are frequently employed in the delivery of chemotherapeutic, oral, ophthalmic, and transdermal medications. The composition, preparation methods, drug encapsulating strategies, drug loading, release mechanism, and applications pertinent to cubosomes will all be thoroughly examined in this paper. Additionally, the difficulties in maximizing certain factors to improve loading capabilities and prospects are also discussed.*

Keywords: drug delivery systems, nanomedicine, cubosomes, and characterization.

