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NANOSTRUCTURES FOR DRUG DELIVERY

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Chapter 17 Nanoparticulate carrier(s): an emerging paradigm in new generation vaccine development

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Abstract

Vaccination has been accomplished as one of the most effective method of regulating microbial infections. Progress in nano-biotechnology has created opportunities for the development of a nanocarrier-based new generation of vaccines against various diseases such as cancer, malaria, hepatitis B, anthrax, AIDS, etc. Nanoparticulate-carrier-based vaccine delivery is a promising approach owing to their nano size, biodegradability, biocompatibility nature, immune adjuvant property, spatiotemporal delivery of antigens, and ability to provide effective immunization through better targeting and by triggering antibody response at the cellular level. Nanoparticulate carriers can overcome the major challenges associated with conventional vaccines such as stability, low immune response, biocompatibility, degradation followed by clearance from the site sometimes prior to the desired action. Nanocarriers include polymeric nanoparticles, liposomes, niosomes, bilosomes, emulsomes, nanocapsules, and so forth progressively being applied for effective nanovaccines development. The proposed chapter summarizes the cutting edge technologies of nanoparticulate-carrier-based new generation of vaccine development, including design aspects, clinical trials, and so on.

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