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Particulate Technology for Delivery of Therapeutics

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Nanotechnology-Based Immunotherapeutic Strategies for the Treatment of Cancer

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Abstract

Cancer is a dreadful disease and presently the leading cause of death worldwide. Scientists are continuously exploring new treatment regimen for successful management of this disease. Advancement in the field of nanotechnology and its integration with the field of immunotherapy has paved new ways for improving the treatment of cancer. Immunotherapy refers to therapeutic approaches that treat cancer by using patient's own immune system. By using nanometric-sized particulate and vesicular carriers, tumor-associated antigen(s) and adjuvant(s) can be simultaneously administered which augment the immune system activation and this concept can be wisely used for designing nanotechnology-based cancer immunotherapy. Also nanotechnology-based immunotherapy confers certain benefits like enhanced therapeutic effect, targeted delivery to immune cells, and reduced adverse outcomes. Nanotechnology-based therapeutic cancer vaccine consists of antigen(s), delivery system, and adjuvant. This chapter comprises of the expected outcomes of simultaneous delivery of tumor-associated antigen(s) and adjuvant to dendritic cells using vesicular and particulate vaccine delivery system(s). It is also a summarized overview on the advancement of polymeric- and lipid-based delivery systems for the development of nanotechnology-based cancer immunotherapy.

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