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*Heyam Saad Ali*

Dubai Pharmacy College, UAE

Recent technologies and drug delivery systems (DDS): Therapeutic applications

The purpose of any delivery system is to enhance or facilitate the action of therapeutic compounds. It should now be apparent that conventional drug delivery systems are associated with a number of limitations which can reduce drug efficacy. These limitations include an inability to facilitate adequate absorption of the drug, facilitate adequate access to the target site, prevent non-specific distribution throughout the body (resulting in possible toxic side effects and drug wastage), prevent premature metabolism, prevent premature excretion, match drug input with the required timing (zero-order or variable input) requirements. Limitations of conventional drug delivery systems are particularly acute for the new biotherapeutics, such as peptide and protein drugs and nucleic acid therapies. Advanced drug delivery and targeting systems are thus being developed in order to optimize drug therapy and overcome these limitations. Utilization of nanoparticles as drug carriers promises a significant improvement. In cancer treatment targeted delivery can reduce the systemic side effects that patients must endure under traditional chemotherapy by ensuring that pronounced cytotoxic levels of the drugs are only presents at the tumor sites release their payloads in response to a variety of different stimuli, either those specific to the tumor microenvironment, such as acidic pH values and elevated secretion of certain enzymes or external ones. Nanoparticles can also offer multi-functionality, combining both diagnostic and therapeutic features a combination known as theranostics. Smart emerging nanotechnologies, with reference to the various routes of delivery under investigation in various fields of nano-medicine.

Biography

Heyam Saad Ali is currently working as the Head of Pharmaceutics Department in Dubai Pharmacy College, UAE. She has contributed more than 50 articles to reputed international scientific journals in different conventional, controlled and targeted drug delivery systems in pharmaceutical product development. She has been invited as speaker to numerous international conferences. She is a reviewer and Member of Editorial Board of many international journals.

heyam57@hotmail.com**Notes:**