

A foresight note on nanomedicine role in revolutionising drug delivery

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Recent years have shown the breakthrough in the field of science, especially in drug designing and delivery system. But whenever we think of drug delivery in today's world, the first thing that strikes us is nanoscience and nanotechnology. This tremendous development in drug delivery for the discovery of therapeutic led to the introduction of nanomedicine. Nanomedicine is the branch of medicine that uses nanotechnology to cure, diagnose and sense the disease in a living organism through nanorobots and nanoparticles. One of the fundamental challenges in drug delivery is targeting the drug to selectively accumulate near the targeted organ or tissue, avoiding side effects occurring to nontarget organs or tissues and this could be achieved with the help of nano-based drug delivery systems. Besides allowing targeted drug delivery offers multiple benefits, such as reduced toxicity, biocompatibility, improved bioavailability, controlled release of therapeutic agents, etc. However, there are two ways through which nanoparticles deliver the drug and they are passive and self-delivery. In passive delivery, drugs are incorporated in the inner cavity of nanostructures through the hydrophobic effect. In this way, the intended amount of drug gets released when these nanomaterials are targeted to a particular site in a body. In self-delivery, the drug intended for release is conjugated to the nanomaterial; here the timing of drug release is of great importance as the drug will not reach the target site and it will get dissociated from the carrier instantaneously. Currently, nanomedicine is employed in treating various chronic diseases and cancer treatment is one of them.

Keywords: Nanoparticles, Drug delivery, Cancer, Drug designing, Biocompatibility

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