

## Nano Drug Delivery Systems **Chiranjeevi Sirikonda**

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### Perspective

There have been significant advancements in the field of delivery systems for delivering therapeutic agents or natural-based active chemicals to their target locations for the treatment of a variety of diseases. Although a lot of drug delivery systems have been successfully implemented in recent years, there are still some issues to be addressed and sophisticated technologies to be created in order to successfully transport medications to their target sites. As a result, nano-based drug delivery systems are currently being investigated in order to promote the development of a more advanced drug delivery system. Nano medicine is a branch of medicine that employs nanotechnology in the prevention and treatment of diseases by using Nano scale materials such as biocompatible nanoparticles.

Because of its potential advantages, such as the ability to modify properties like solubility, drug release profiles, diffusivity, bioavailability, and immunogenicity, drug design at the Nano scale has been extensively studied and is by far the most advanced technology in the field of nanoparticle applications. As a result, more convenient administration methods may be developed, as well as decreased toxicity, fewer adverse effects, enhanced biodistribution, and a longer medication life cycle. Engineered drug delivery systems are either targeted to a specific location or are designed to release therapeutic substances in a regulated manner to a specific region. Their formation involves self-assembly, in which building blocks spontaneously create well-defined structures or patterns. They must also overcome

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obstacles such as opsonization/sequestration by the mononuclear phagocyte system.

Nanostructures can distribute medications in one of two ways: passive or self-delivery. Drugs are primarily incorporated into the inner cavity of the structure via the hydrophobic action in the former. Because of the low content of the medications, which is enclosed in a hydrophobic environment, the required amount of the drug is released when the nanostructure materials are targeted to specific places. The medications intended for release, on the other hand, are immediately conjugated to the carrier nanostructure material for convenient delivery. The timing of release is critical in this strategy since the drug will not reach the target site and will dissociate from the carrier quickly, and its bioactivity and efficacy will be reduced if it is released from its Nano carrier system at the wrong time.