

Research and Development of Functional Drug Carriers with Biodegradable Polymer

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With recent advent of genome sciences or drug screening and gene technologies, it has been practically possible to design and prepare various bioactive substances (so-called therapeutic drugs) of different molecular types, such as low-molecular-weight compounds, peptides, proteins, and nucleic acids, which presently alters the concept and category of the conventional therapeutic drugs. Under this circumstance, significance of drug delivery system (DDS) technology and methodology has increasingly been noted to enhance the biological activities of bioactive substances used and their targetability to the site of action.

What is DDS? So far, it has been histologically defined as the technology and methodology of pharmaceutical sciences to enhance the therapeutic efficacy of drugs. However, this must be wrong. It is the fundamental idea of DDS that a substance delivers to maximize its biological activity by manipulating the delivery method and formulation, minutely controlling the in vivo distribution and fate, and achieving the selective delivery to the site to be acted on in a desirable time or concentration fashion. Considering this concept, it would be better to define DDS as the universal and fundamental technology and methodology applicable for any substance to expect the enhanced biological activities. This paper introduces several concrete examples about biomedical applications of functional drug carriers to discuss the significant role in medical therapy of the 21st century.