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Nanotechnology in pharmaceutical formulation design and development

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Application of biopharmaceutical concepts to formulation development has revolutionized strategy for dosage form design. Nanotechnology has become an essential element of pharmaceutical sciences and finds multiple applications in drug delivery systems in enhancing therapeutic performance of drugs. Many of the current nano-drug delivery systems are pedigree of conventional dosage forms like Nano suspensions, Nano emulsions and Nano micelles. Nano suspension is an approach to deliver water insoluble and poorly bioavailable drugs by reducing size to submicron range. Thereby its dissolution rate is increased and hence the bioavailability, where drug dissolution rate is the limiting factor. Nano emulsions are O/W or W/O emulsion, having droplet size from 20-200 nm that are transparent and do not have the tendency to coalesce. Nano emulsions show great aesthetic appeal and skin feel and find their application in transdermal delivery of drugs, topical application for systemic drug delivery, oral delivery of proteins and delivering drugs through parenteral and intranasal routes.

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