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## Pharmaceutics & novel drug delivery systems

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**N**ovel Drug delivery System (NDDS) refers to the approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effects. NDDS is a system for delivery of drug other than conventional drug delivery system. NDDS is a combination of advance technique and new dosage forms which are far better than conventional dosage forms. Advantages of Novel Drug Delivery System are: Optimum dose at the right time and right location, Efficient use of expensive drugs, excipients and reduction in production cost, Beneficial to patients, better therapy, improved comfort and standard of living. Basic modes of novel drug delivery systems are: Targeted Drug Delivery System, Controlled Drug Delivery System and Modulated Drug Delivery System

Factors affecting the design of controlled release products are: Physicochemical properties of a drug, Route of administration, Acute / Chronic therapy, Target sites, The Patient, The disease state/level. Classification of novel drug delivery system with reference to release control is: 1. Matrix diffusion types (In which rate of release is controlled by diffusion of dissolved drug in the matrix). a. Rigid Matrix Diffusion (in which insoluble plastic materials like PVP & fatty acids are used). b. Swellable Matrix Diffusion (in which Hydrophilic gums like guar gum, tragacanth, HPMC, CMC, Xanthan Gum & Polyacrilamides are used). These are also called Glassy Hydrogels and popular for sustaining/control the release of highly water soluble drugs. c. Reservoir System (in which polymer content in coating, thickness of coating & hardness of micro-capsules control the release of the drug). 2. Dissolution Matrix Type (in which drug is homogeneously dispersed throughout in a rate controlling medium waxes like bees wax, carnuba wax, hydrogenated castor oil, which control the drug dissolution by controlling the rate of dissolution). a. Encapsulation (in which dissolution is controlled by dissolution controlling coating system like use of cellulose, Polyethylene. Glycols, polymethylacrylates, and waxes. Dissolution rate also depend upon coating material stability and thickness of coating film. 3. Dissolution & Diffusion Controlled Release System (in which drug is encapsulated in partially soluble membrane, pores are created due to soluble parts of coating film which permits entry of aqueous medium into core and drug dissolution starts by diffusion of dissolved drug out of system. Mixture of water soluble PVP and water insoluble ethyl cellulose is used for this purpose). 4. Water penetration/Osmotic Pressure Controlled NDDS 5. Chemically controlled NDDS 6. Hydrogels (in which three dimensional structures of hydrophilic polymers having chemical and physical cross links provide a network structure to hydrogels. These are insoluble due to network structure and provide desirable protection of liable drugs, proteins and peptides). 7. Ion Exchange Resins Controlled Release Systems

## Biography

Tariq Jamshaid has 11 years diversified work experience of Quality Control, Manufacturing Processes, Pharmaceutical Product Design & Development, Process Optimization, Laboratory Management, Drug Registration Processes, GMP Requirements, Drugs Laws, Statistical Methodology, Manufacturing Process Validation, Cleaning Validation, ISO 9001:2008 with strong scientific, analytical, statistical, planning, managerial and training skills. Currently he is working as a Sr. Manager Production & Development for Surge Laboratories Private Limited, Pakistan.

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