NOVEL DRUG DELIVERY SYSTEM

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Book Title: **Novel Drug Delivery System**

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Price: ₹675

1st Edition

ISBN: **978-81-976840-6-7**

Published: **July 2024**

Publisher:

Kripa-Drishti Publications
A/ 503, Poorva Height, SNO 148/1A/1/1A,
Sus Road, Pashan- 411021, Pune, Maharashtra, India.
Mob: +91-8007068686
Email: editor@kdpublications.in
Web: https://www.kdpublications.in

PREFACE

A novel approach known as the "**Novel Drug Delivery System**" makes use of cutting-edge concepts, technologies, and techniques to deliver active molecules at a safe concentration that will nonetheless have the desired pharmacological effect. To achieve the desired effect for a longer period of time, the novel drug delivery system can also maintain the plasma drug concentration in a controlled manner.

In order to deliver the contained medication to the target tissues in a preprogrammed way, carrier modules have been developed using interdisciplinary approaches and state-of-the-art technology. The location of drug targeting changes drug by activity and kinetics, among other challenges associated with the novel drug delivery system. Each patient has a unique metabolism, and each drug may react differently in terms of efficiency, which makes it challenging to define. Clinical trials are costly and challenging to carry out.

This book's objective is to compile an overview of significant, targeted technologies utilised in drug delivery systems (DDS). This selection takes significant medications, novel technologies like nanoparticles, and significant therapeutic applications into account. For pharmacologists and pharmaceutical scientists employed in both industry and academia, this book will be a valuable resource. For scientists and physicians working in various fields related to the development of DDS, including chemical engineering, protein engineering, gene therapy, and so forth, it contains pertinent information. Executives overseeing research and development at several hundred companies creating drug delivery technologies will find this to be a valuable resource. For undergraduate and graduate students, as well as anybody interested in the operation and performance of drug delivery systems, this is an invaluable textbook and resource.

Objectives:

Upon Completion of the Course student shall be able

1. To understand various approaches for development of novel drug delivery systems.
2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation.

Abbreviations

Active Pharmaceutical Ingredient (API)
Apparent partition coefficient (APC)
Autosomal Dominant Retinitis Pigmentosa (ADRP)
Blood-Retina Barrier (BRB)
Bruch's Membrane (BM)
Chronic Obstructive Pulmonary Disease (COPD)
Ciliary Neutropic Factor (CNTF)
Clearance (CL)
Complementarity-Determining Regions (CDRs)
Controlled Release (CR)
Critical Packing Parameter (CPP)
Cryo-Transmission Electron Microscopy (cryo-TEM)
Cytomegalovirus (CMV)
Dehydration and Rehydration (DRV)
Development of Intrauterine Device (IUD)
Diazo-Oxo-Norleucine (DON)
Dicetyl Phosphate (DCP)
Di-O-Octadecenyl-3-Trimethylammonium Propane (DOTMA)
Distearoyl-Sn-Glycero-Phosphatidylcholine (DSPC)
Dose (D)
Drug Delivery Systems (DDS)
Dry Powder Inhalers (DPIs)
Effective Dose (ED)
Encapsulated Cell Technology (ECT)
Enhanced Permeability and Retention (EPR)
Entrapment Efficiency (EE)
Ethylene Vinyl Acetate (EVA)
Extrusion Technique (VET)
Floating Drug Delivery Systems (FDDS)
Fluocinolone Acetonide (FA)
Freeze And Thaw (FAT)
Gastric Retention Time (GRT)
Glutamic Acid (GA)
Glyceraldehyde-3-Phosphate Dehydrogenase (GAPDH)
High-Pressure Homogenization (HPH)
Human Immunodeficiency Virus (HIV)
Human Papillomavirus (HPV)
Hydrodynamic Radius (Rh)
Hydrodynamically Balanced System (HBS)
Hydrophilic–Lipophilic Balance (HLB)
Hydroxypropyl Cellulose (HEC)
Hydroxypropyl Cellulose (HPC)

Hydroxypropyl Methylcellulose (HPMC)
Hypoxanthine Aminopetrin Thymidine (HAT)
Hypoxanthine-Guanine-Phosphoribosyl Transferase (HGPRT)
Implantable Drug Delivery Systems (IDDSs)
include hydroxypropyl methylcellulose (HPMC)
Inflammatory Bowel Disease (IBD)
Internal Limiting Membrane (ILM)
Irritable Bowel Syndrome (IBS)
Large Unilamellar Liposomes/Vesicles (LUV)
Large Unilamellar Vesicles (LUVs)
Lethal Dosage (LD)
Lipid Drug Conjugate (LDC)
Lipopolysaccharide (LPS)
Lipoteichoic Acid (LTA)
Loaded Folic Acid (FA)
Low Density Lipoprotein (LDL)
Lower Critical Solution Temperature (LCST)
Magnetic Nanoparticles (MNPS)
Magnetic Resonance Imaging (MRI)
Matrix Metalloproteinases (MMPs)
Maximum Therapeutic Concentration (MTC)
Medium Unilamellar Vesicles (MUL)
Metered-Dose Inhaler (MDI)
Metered-Dose Inhalers (MDIs)
Microneedles (MLs)
Minimum Effective Concentration (MEC)
Multilamellar Liposomes/Vesicles (MLV)
Multilamellar Vesicles (MLVs)
Multivesicular Liposomes/Vesicles (MVV)
Mycobacterial Membrane Protein Large5 (MmpL5)
Nanoparticles (NP)
Nanostructured Lipid Carriers (NLC)
Ocular Drug Delivery System (ODDS)
Ocular Therapeutic System (OTS)
Oligodeoxynucleotide (ODN)
Oligolamellar Vesicles (OLV)
Particle Replication in Non-Etting Templates (PRINT)
Phase change material (PCM)
Phosphotungstic Acid (PTA)
Poly (D, L-Glycolide) (PLG)
Poly (lactic acid) (PLA)
Poly 2-Hydroxyethyl Methacrylate (pHEMA)
Poly Acrylic Acid (PAA)
Poly Amidoamine (PAMAM)
Poly Cyanoacrylate (PCA)
Poly Ethylene Glycol (PEG)

Poly Lactic-Co-Glycolic Acid (PLGA)
Polyaprolctone (PCL)
Polydispersity Index (PDI)
Polyethylene Glycol (PEG)
Polyglycolic Acid (PGA)
Polyhydroxy Butyrate Vel (PHBV)
Polymeric Micelles (PMS)
Polyn-Isopropylacrylamide (PNIPAAm)
Polypyrrole (PPy)
Polyvinyl Alcohol (PVA)
Polyvinyl Chloride (PVC)
Polyvinylpyrrolidone (PVP)
Quantum Dots (QD)
Reticuloendothelial System (RES)
Retinal Pigment Epithelium (RPE)
Reverse Phase Evaporation (REV)
Rheumatoid Arthritis (RA)
Small Unilamellar Liposomes/Vesicles (SUV)
Small Unilamellar Vesicles (SUVs)
Sodium Carboxymethyl Cellulose (NaCMC)
Solid Lipid Nanoparticles (SLN)
Soluble Ophthalmic Drug Insert (SODI)
Stearyl Amine (SA)
Stratum Granulosum (SC)
Toll-Like Receptor (TLR)
Transdermal Drug Delivery Systems (TDDS)
Triamcinolone Acetonide (TA)
Tumor Necrotic Factor-alpha (TNF-alpha)
Ultraviolet Radiation (UV)
Unilamellar Vesicles (ULV)
Upper Gastrointestinal Tract (GIT)
Vascular Endothelial (VE)
Vascular Permeability Enhancement (VPE)

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KRIPA DRISHTI PUBLICATIONS

Price: ₹675

Kripa-Drishti Publications
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Pune – 411021, Maharashtra, India.
Mob: +91 8007068686
Email: editor@kdpublications.in
Web: https://www.kdpublications.in

ISBN: 978-81-976840-6-7

9 788197 684067