



**P.E. Society's
Modern College of Pharmacy, Nigdi, Pune.**

Major Research Areas of the Department of Pharmaceutics

- ❖ Solubility enhancement techniques (Spray drying, Hot melt extrusion, Lyophilization).
- ❖ Spray coating technology (R&D coater)
- ❖ Particle size reduction (Probe sonicator, High speed homogenizer).
- ❖ Targeted drug delivery systems.
- ❖ Nanotechnology-based drug delivery systems.
- ❖ Carbon nanotube carrier-based drug delivery systems.
- ❖ Niosomes, Liposomes, and Ethosomes, Invasomes-based drug delivery systems.
- ❖ Nanocomposite-based drug delivery systems.
- ❖ Silicon nanoparticles-based drug delivery systems.
- ❖ Selenium nanoparticles-based drug delivery systems.
- ❖ Osmotic-controlled drug delivery systems.
- ❖ Compression coating-based pulse-tile drug delivery systems.
- ❖ Ophthalmic drug delivery systems.
- ❖ Transdermal drug delivery systems.
- ❖ Herbal-based drug delivery system



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Major Research Areas of the Department of Pharmaceutical Quality Assurance

- ❖ Development, optimisation, and evaluation of novel drug delivery systems
- ❖ Development of Phytopharmaceuticals based on conventional and novel drug delivery systems
- ❖ Drug delivery via fast-dissolving films
- ❖ Film coating
- ❖ Self-emulsifying drug delivery systems
- ❖ Development and validation of stability-indicating analytical methods on bulk drugs and marketed formulations, such as UV spectroscopy, HPLC, etc.



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Major Research Areas of the Department of Pharmaceutical Chemistry

- ❖ Drug Design & Discovery (Medicinal Chemistry)
- ❖ Structure–Activity Relationship (SAR) Studies
- ❖ Computer-Aided Drug Design (CADD) / Molecular Modeling
- ❖ Natural Product Chemistry & Drug Leads
- ❖ Synthetic Organic Chemistry for Drug Development
- ❖ Biopharmaceuticals & Peptide/Protein Drugs
- ❖ Pharmacokinetics (ADME) & Drug Metabolism
- ❖ Pharmacodynamics & Mechanism-of-Action Studies
- ❖ Prodrug Design & Drug Delivery Optimization
- ❖ Analytical & Bioanalytical Chemistry
- ❖ Pharmaceutical Formulation & Nanotechnology
- ❖ Target Identification & Validation
- ❖ Chemical Biology & Biomarker Discovery
- ❖ Toxicology & Safety Assessment
- ❖ Radiopharmaceutical Chemistry
- ❖ Green Chemistry & Sustainable Drug Synthesis
- ❖ Genomics-based & Personalized Medicine Research
- ❖ Regulatory Chemistry & Quality Control



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Thrust Areas/Major Research Areas of the Department of Pharmacology

- ❖ Diabetes and Diabetic Complications
- ❖ Inflammation
- ❖ Insulin resistance
- ❖ Antisnake venom activity
- ❖ Rheumatoid Arthritis
- ❖ Wound healing
- ❖ Hypertension
- ❖ Atherosclerosis
- ❖ Gout
- ❖ Urolithiasis
- ❖ Pharmacological evaluation of bioactive compounds.
- ❖ Neuropharmacology



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Thrust Areas/Major Research Areas of the Department of Pharmacognosy

- ❖ Isolation and Characterization of Phyto-constituents
- ❖ Formulation and Evaluation of Herbal Products and Cosmetics
- ❖ Herbal Drug Standardization
- ❖ Extraction of Fixed and Volatile Oils
- ❖ Micro-Photographic analysis of Crude Drugs