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A Review on Nasopulmonary Drug Delivery System

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Abstract: *Nasal and nasopulmonary drug delivery have gained increasing attention as convenient, reliable, and promising routes for systemic drug administration. Their advantages include high vascularity, large surface area, rapid absorption, and the avoidance of hepatic first-pass and gastrointestinal metabolism. Despite these benefits, the design of effective nasopulmonary drug delivery systems (NPDS) remains challenging. Critical factors such as particle size, shape, surface properties, and stealth characteristics significantly influence the ability of nano and microparticles to reach targeted sites within the respiratory tract. NPDS offer notable potential for treating a wide range of conditions, including allergies, respiratory disorders, and central nervous system diseases that require rapid or targeted drug delivery, such as Parkinson's and Alzheimer's diseases. Various device strategies ranging from sprays and drops to gels and solid formulations are being explored to enhance drug deposition, retention, and therapeutic efficiency. Optimizing these systems is essential for improving safety, patient compliance, and overall clinical outcomes..*

Keywords: Naso-Pulmonary drug delivery, Mucociliary clearance, Nasal, Pulmonary, Respiratory tract

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