Nanotechnology-based therapeutics for targeting inflammatory lung diseases

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Abstract

The physiochemical properties of drugs used in treating inflammation-associated lung diseases (i.e., asthma, chronic obstructive pulmonary disease, pulmonary fibrosis) play an important role in determining the effectiveness of formulations. Most commonly used drugs are associated with low solubility, low stability and rapid clearance, thus resulting in low bioavailability and therapeutic index. This review focuses on current trends and development of drugs (i.e., corticosteroids, long-acting β-agonists and biomacromolecules such as DNA, siRNA and mRNA) employed to treat inflammatory lung diseases. In addition, this review includes the current challenges of and future perspective with regard to nanotechnology in the treatment of inflammatory lung diseases.

Keywords: COVID-19; T lymphocytes; asthma; chronic obstructive pulmonary disease; fibrosis; idiopathic pulmonary fibrosis; lung inflammation; macrophages; nanotechnology; neutrophils.