

Pulmonary Drug Delivery Systems, A Versatile Technique

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Pulmonary drug delivery system has been widely used since decades for the treatment of lung diseases and is acclaimed for the treatment of asthma and chronic obstructive pulmonary diseases. Delivery of locally acting drugs directly to the site of action reduces the amount of dose needed to produce the pharmacological effect but now the lung has been studied as a possible route to administer the treatment of systemic diseases, like diabetes mellitus. The site of deposition that is on central or peripheral airways and whether the distribution of the inhaled drug is uniform or non-uniform may play a vital role in an inhaled drug's effectiveness. Today, there are a number of different inhaled products of more than twenty active ingredients marketed to treat respiratory disease. In near future, more efficient and efficacious inhaled therapies for respiratory diseases, inhalable gene therapy and the treatment of systemic diseases may occur. Normal pulmonary circulation is a low-pressure high capacitance bed that receives 100% of the cardiac output. The intimal lining of all blood vessels is made of a continuous single layer of ECs (Endothelial cells). Due to this specific characteristic of lungs, pulmonary drug delivery system is a magnificent means of treatment of certain diseases. Pulmonary drug delivery offers local and systemically targeting for the treatment of respiratory diseases. Pulmonary delivery is apprehended by various ways like:

- a) Aerosols
- b) Metered dose inhaler systems
- c) Dry powder inhalers and
- d) Nebulizers.

These systems may contain nanostructures such as microemulsions, micelles, liposomes, and bio-degradable nanoparticles. According to the need we have numerous types of dosage forms like immediate release or sustained release. The sustained release dosage forms are preferred over the uncoated, immediate release due to the following reasons:

- a) Increase in the local effects on use at the site of infection.
- b) Need of relatively small doses for the effective therapy.
- c) Reduction in systemic exposure due to local application leads to reduction of adverse effects.

Some scientists are trying to investigate and evaluate the use of a sustained release form of inhaled rifampin for TB therapy. The pulmonary drug delivery field is efficacious, stupendous and advanced technique in today's applied pharmaceutical research.

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