

# Nanotechnology in the respiratory medication

Beulah Leena\*, Hepsiba Evan

### Abstract

In the field of pharmaceuticals, nanotechnology is playing crucial role by giving a path for the researchers to bring out new ways developing new dosage forms with good efficiency for better therapeutic effect. Here the different ways how the technology advancements brought down impact in the pharmaceutical industries are mentioned in this commentary.

**Keywords:** Nanotechnology; Respiratory medicine; Pulmonary diseases

### Introduction

Since long back, our ancestors widely used the plant based extracts as medicines for various infections as well as diseases. In this modern era, the natural plant extracts are being modified with the synthetic preparations on the name of better and efficient effects. Though the preparations are made on the basis of the traditional knowledge, there are several researches being made to show the maximum therapeutic effects. Almost 30%-45% of the pharmaceutical products are from the natural source. These natural compounds have different backgrounds with respect to their chemical moieties, properties and effects which play an important role at times of drug discovery. These days, the most interesting as well as trending in the field of drug discovery is natural extract based drug discovery. As the natural based extracts have the utmost and unremarkable characteristics, the synthetically derived drugs are having good effects also favourable. The computational studies are helping to find out the plant based extractions with synthetics as a dosage form in fast possible ways and giving an idea on their pharmacological effects.

With the advancements in the technology round the globe, there are advancements in the pharma industries too. Of many advancements, nanotechnology is one, which is trending for different drug delivery systems. This has become a bridge to elevate the drug discovery by the application of nano based drug delivery systems. The main reason for the nanotechnology to bridge into the pharmaceutical dosage forms. As the particle size would be around 1 nm and 100 nm, the interest is shown as the range of drug delivery will show with the highest efficiency in therapeutic

as well as pharmacological effects. This employs at nanoscale development of the medicines i.e., nanomedicines. The field of nanomedicine includes drug delivery, biotechnology, biosensors, tissue engineering which are been powered by the nanoparticles. The nanoscale sized particles attain the unique characteristics such as biological, chemical, mechanical, magnetic, electrical properties. Because of the properties that it is exhibiting, this nano-based drug delivery system has become more appreciable in these recent times due to a fact that nanostructures are used which encapsulates the therapeutic drugs and delivers them to target the organs and the tissues.

Pulmonary diseases count about 20% to 30% of deaths globally. These pulmonary diseases give emotional pain as breathing is difficult and it makes patient to lose hope on life. Nanomedicine is one of the emerging fields by the use of the advanced technology in the branch of nanoscience that includes the nano-sensors in diagnosis, drug delivery etc. Nanomedicine is effective clinically and safe though to deliver the medicine to the targeted tissues as well as the organs i.e., lungs. This nanotechnology offers the unique techniques to develop new forms of the therapeutics such as aerosolized forms which helps the drug to directly reach the lungs. This is mostly helpful for targeting the lungs with the infections or the diseases such as the cystic fibrosis, chronic obstructive pulmonary disease or chronic obstructive airway disease, asthma and even cancer. In recent times, for treating SARS-CoV this nanomedicine really played vital role.

The nanoparticles have the capacity to pass through the targeted organs or tissues or the membranes, because of their nano size. By the use of several hydrophilic or hydrophobic or both compounds as well as the biological molecules such as the DNA's, RNA's, peptides etc., provides to optimize the drug delivery to target the organs. By the application of the nanotechnology for pulmonary diseases regards the high range of application in treating during clinical stage. Therefore, nanomedicine is being currently under employment for treating several respiratory diseases from acute to chronic conditions under medical practitioner's prescription.

*Department of Pulmonary medicine, The University of Edinburgh, UK*

*Corresponding author: Beulah Leena, e-mail: beulahL@ed.ac.uk*