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# FORMULATION OF NANOPARTICLES FOR LUNG ADMINISTRATION

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## Introduction

Chronic lung disease includes a wide variety of persistent conditions, such as: pulmonary tuberculosis, asthma, cystic fibrosis, chronic obstructive pulmonary disease, lung cancer, etc. Current pharmacotherapy, although effective, does not contribute to the complete restoration of lung function. An advanced strategy would be the use of nanoparticles in pulmonary administration.

## Keywords

Lung diseases, treatment, nanoparticles.

## Purpose

Study of the available literature to highlight the types of nanoparticles possible to be used in the treatment of lung diseases.

## Material and methods

Bibliographic study of listed journals from electronic bases (Pubmed and Hinari) in the field of development of drug products related to nanoparticles as anticancer agents, antivirals, antituberculosis agents, antibiotics, steroids and current efforts to achieve lung-oriented medicine.

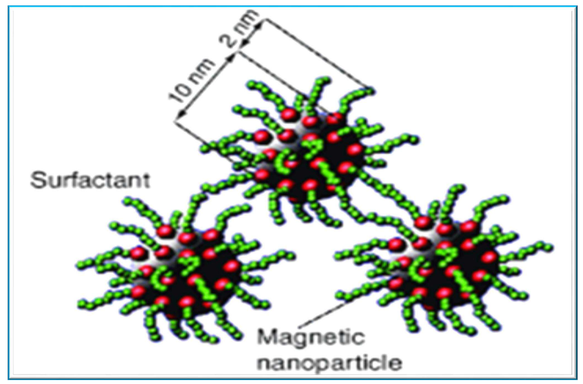


**Fig. 1 Magnetic nanoparicles**
https://www.researchgate.net/figure/Magnetic-nanoparticles_fig2_216213322

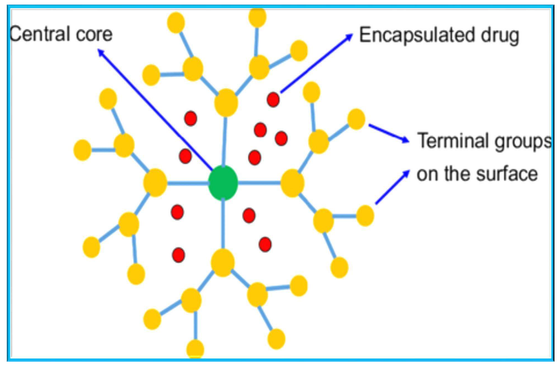


**Fig. 2. Dendrimers**
https://www.researchgate.net/figure/Structure-of-dendrimers_fig3_327645542

## Results

Traditional pharmacotherapy used in lung diseases often faces limitations, and inadequate pharmacokinetics and insufficient release of specific drugs often lead to a poor response to treatment. In addition, an efficient vector system is a necessary condition for successful gene therapy, because genetic molecules are not easily released into cells without carriers and often degraded into biological fluids.

To solve these problems, nanoparticles are highly promising as drug carriers such as liposomes, micelles, polymeric nanoparticles, magnetic nanoparticles (fig.1), dendrimers (fig.2), and others. The main determinant for the *in vivo* distribution of inhaled nanoparticles is the aerodynamic diameter of the nanoparticles (20-100 nm). PEGylation of nanoparticles reduces their opsonization by immune cells and makes them able to enter the respiratory mucus.

## Conclusions

Magnetic nanoparticles and dendrimers are promising vehicles for specific lung treatment.