**Chitosan-Based Drug Carrier Systems**

***Habsa ADEN ALI 1 , Muhammed Bora AKIN 2,[[1]](#footnote-1)\* ***

*1* **0009-0001-0081-2389** *Institute of Graduate Studies, Çankırı Karatekin University, , 18100, Çankırı, Türkiye*

*2***0000-0003-3841-1633** *Department of Chemical Engineering, Çankırı Karatekin University, , 18100, Çankırı, Türkiye*

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| **Abstract** Respiratory diseases are becoming increasingly prevalent worldwide and are significantly responsible for global mortality, including conditions such as asthma, chronic obstructive pulmonary disease, pneumonia, cystic fibrosis, lung cancer, and coronavirus-related illnesses. Therefore, research aimed at enhancing the efficacy of treatments for these diseases has focused on nanoparticle-based pulmonary drug delivery. Chitosan (CS)-based nanoparticles, due to their intrinsic biological properties, offer significant advantages over other nanocarriers. These benefits include anti-inflammatory, antimicrobial, and mucoadhesive properties. CS nanoparticles have the ability to improve drug stability, prolong their duration of action, enhance targeting, and increase solubility and permeability. Due to these properties, CS nanoparticles are a promising candidate for pulmonary applications. This study aims to highlight the pulmonary drug delivery potential of chitosan nanoparticles and evaluate the role of chitosan in treating respiratory conditions. Furthermore, it provides a vision of potential advancements in therapy through an in-depth analysis of the interactions between CS nanoparticles and drugs. |

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| Keywords Drug, Carrier systems, Chitosan |

1. \* Corresponding author. *e-mail address: mbakin@karatekin.edu.tr* [↑](#footnote-ref-1)