

# Development of Isoniazid Polymeric Nanoparticles for Tuberculosis Treatment <sup>†</sup>

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**Abstract:** In recent decades, many studies have focused on developing new efficient drug delivery systems. Among them, formulations for pulmonary drug delivery biopolymer-based nanoparticles (NPs) appear to be the most promising due to their ability for controlled release and targeting them to a specific site in the respiratory tract. Chitosan (CHI) is a cationic polysaccharide that has gained increasing interest in fabricating nanocarrier systems because it is biodegradable, biocompatible, non-toxic, and has mucoadhesive properties. Isoniazid (IZN) is an antibiotic used for the treatment of tuberculosis. This work aimed to develop and characterize IZN-loaded CHI NPs, as an antibiotic delivery system for tuberculosis treatment. CHI NPs, empty and loaded with IZN, were prepared by ionic gelation method, using sodium tripolyphosphate (TPP) as a cross-linked agent. NPs were characterized by determining their average size and surface charge potential by Dynamic Light Scattering. Empty and IZN-loaded CHI NPs were synthesized in a molar ratio of 7:1. The size of empty and loaded NPs obtained were about 251nm and 241 nm, respectively, and the charge potential on the surface of NPs was ~ +18mV. In summary, CHI nanoparticles can be promising as an inhalatory nanocarrier of anti-tuberculosis antibiotics.

**Keywords:** chitosan; Isoniazid; nanoparticles; tuberculosis.

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## Conflicts of Interest

The authors declare no conflict of interest.