

# Biologically active Co (II), Cu (II), Zn (II) centered water soluble novel isoniazid grafted O-carboxymethyl chitosan Schiff base ligand metal complexes: Synthesis, spectral characterisation and DNA nuclease activity

Murugaiyan Manimohan <sup>1</sup>, Rajakkani Paulpandiyan <sup>2</sup>, Sivashanmugam Pugalmani <sup>3</sup>, Mohamed Aboobucker Sithique <sup>4</sup>

Affiliations + expand

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## Abstract

In this study, the new N, N, O tridentate donor water soluble isoniazid based biopolymer Schiff base ligand and their Co (II), Cu (II), Zn (II) metal complexes were prepared. The compounds were designed for potential biological application such as antibacterial, antifungal, anti-inflammatory, total antioxidant, antidiabetic and DNA binding studies. The synthesized compounds were illuminated in different light sources of various spectra were used to explore the functional groups of Biopolymer derivatives. Thermal degradation, thermal stability and percentage of mass loss for the prepared compounds were investigated through thermo gravimetric and differential thermal (TGA-DTA) analyses. Crystalline structure of synthesized biopolymer derivatives were explored by X-ray diffraction (XRD) studies, the crystallinity of chitosan is gradually decreased after the Schiff base and complex formation. Surface morphology and structures of the prepared compounds were examined using SEM analysis. The magnetic moment and magnetism of the metal complexes were studied using Vibrating-sample magnetometer (VSM). Antidiabetic studies of Biopolymer Schiff base and metal complexes were carried out by  $\alpha$ -amylase inhibitory method. DNA nuclease activities of synthesized metal complexes were investigated by Ultra-Violet (UV) and viscometry methods. The Cu (II) complexes showed better DNA binding results than Co (II) and Zn (II) complexes.

**Keywords:** Antidiabetic; Biological macromolecule; Surface morphology; Thermal stability; Viscometry.