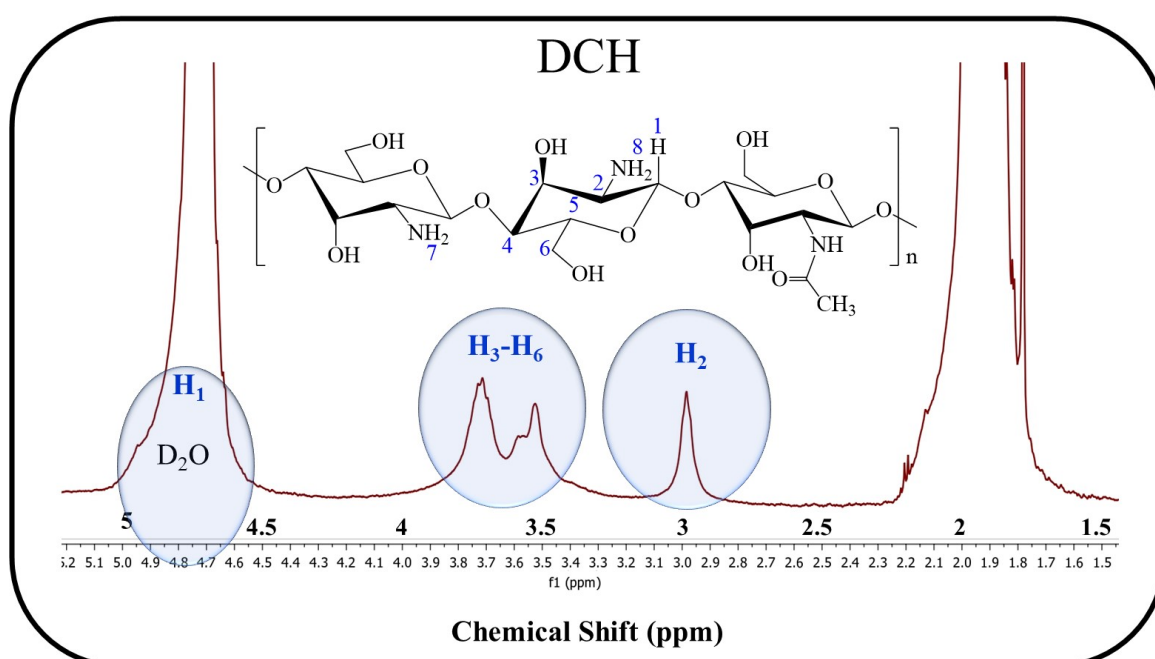


# Evaluation of the antimicrobial activity of Colistin loaded in chitosan-phytic acid nanoparticles against extremely drug-resistant bacteria

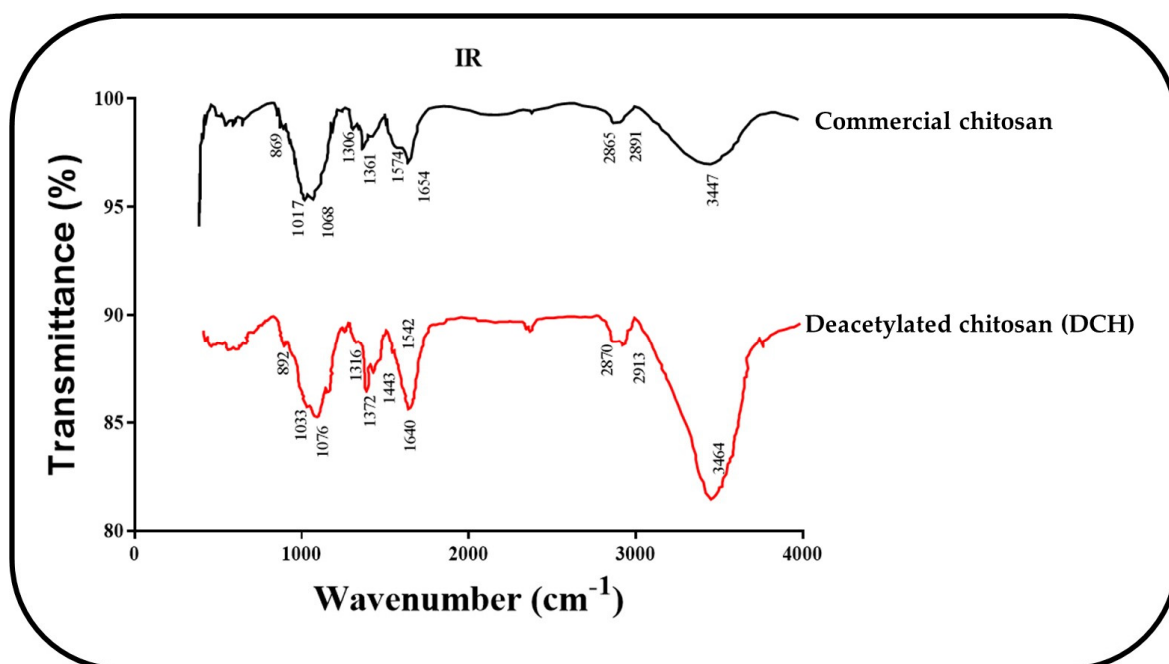
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## Supplementary material



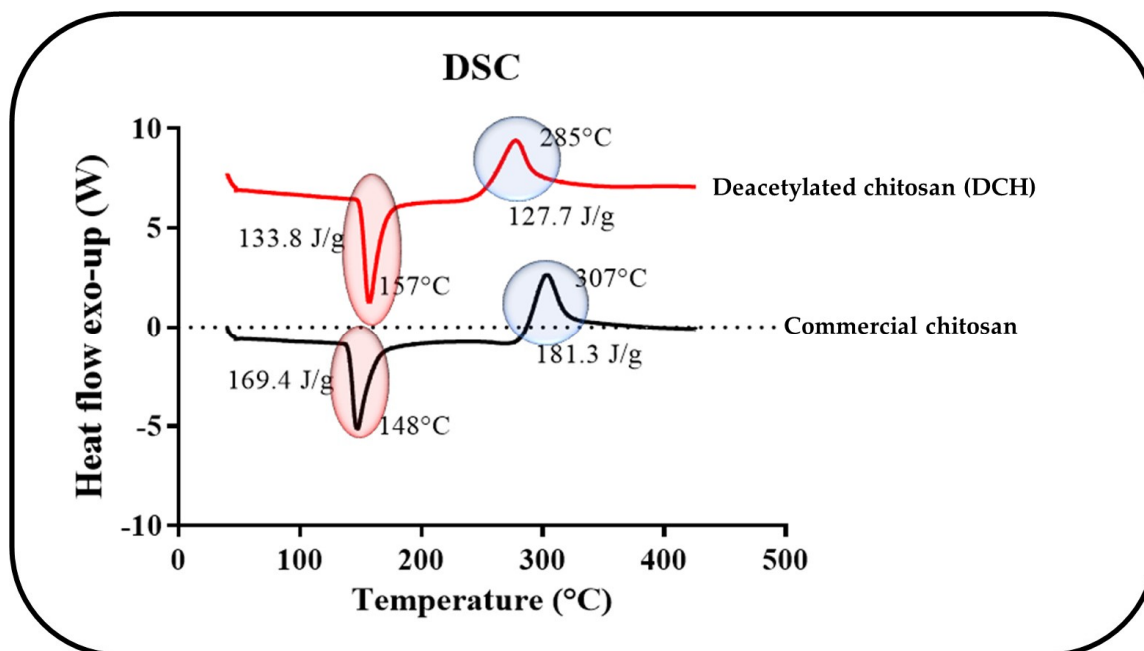
**Figure S1:** <sup>1</sup>H NMR spectra of chitosan with high degree of deacetylation (DCH)

The DCH spectrum shows signals at 2.9-3.1 ppm attributed to the hydrogen proton of the glucosamine subunit. The peaks at 3.4-4.0 ppm represent the H3-6 anomeric protons of the carbohydrate ring. The signal corresponding to H1 (not shown in the spectrum) is obtained at a chemical shift between 4.8-5.0, overlapping with the D<sub>2</sub>O signal.



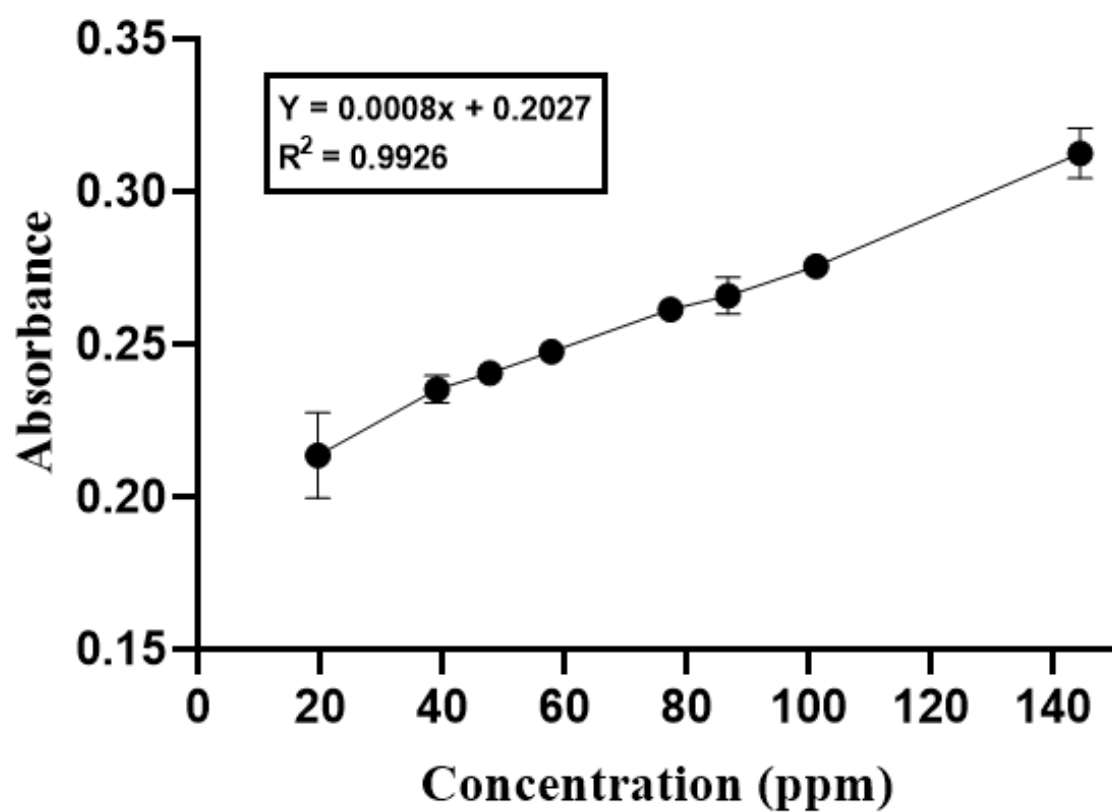
**Figure S2:** FTIR spectra for the commercial chitosan (Aldrich) and processed chitosan with high degree of deacetylation (DCH)

FTIR spectra of DCH showed characteristic peaks at  $3464\text{ cm}^{-1}$ ,  $2913\text{ cm}^{-1}$  and  $2870\text{ cm}^{-1}$  which are attributed to OH vibrations and C-H stretching, respectively. Moreover, it showed vibration bands at  $1654\text{ cm}^{-1}$  due to C=O stretching, and a shoulder due to the deacetylation process at  $1542\text{ cm}^{-1}$  attributed to the deformation of primary amine. Likewise, the peaks at  $1443\text{ cm}^{-1}$ ,  $1372\text{ cm}^{-1}$  and  $1316\text{ cm}^{-1}$  are ascribed to  $\text{CH}_2$  bending and CH deformation, C- $\text{CH}_3$  stretching, and secondary amide stretching, respectively. Further, the vibration signals at  $1076\text{ cm}^{-1}$ ,  $1033\text{ cm}^{-1}$  and  $892\text{ cm}^{-1}$  are attributed to the ring C-O-C stretching, CO stretching and the C-O-C linkage stretching, respectively.



**Figure S3:** DCS Thermogram for commercial chitosan (Aldrich) and processed chitosan with high degree of deacetylation (DCH)

The thermogram of DCH polymer presented an endothermic peak at 157°C, which was attributed to the melting temperature. In addition, the exothermic peak was shifted to 307°C due to the loss of amine groups of the chitosan backbone and partial depolymerization of chitosan.



**Figure S4:** Calibration curve of colistin for calculating the encapsulation efficiency.