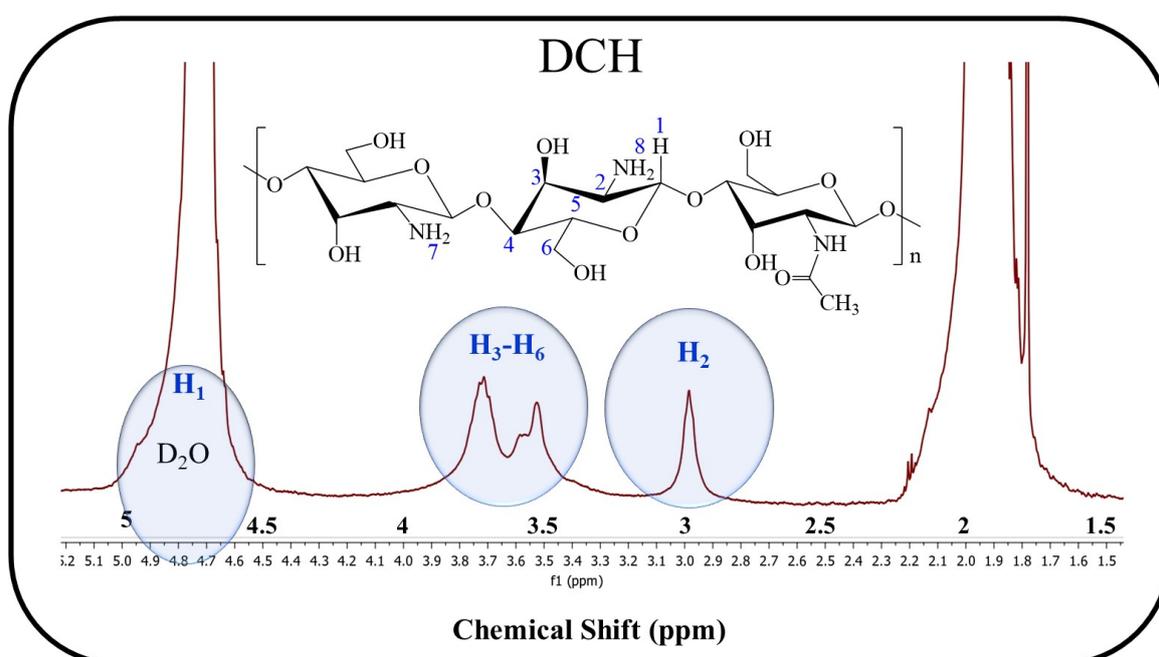


# Evaluation of the antimicrobial activity of Colistin loaded in chitosan-phytic acid nanoparticles against extremely drug-resistant bacteria

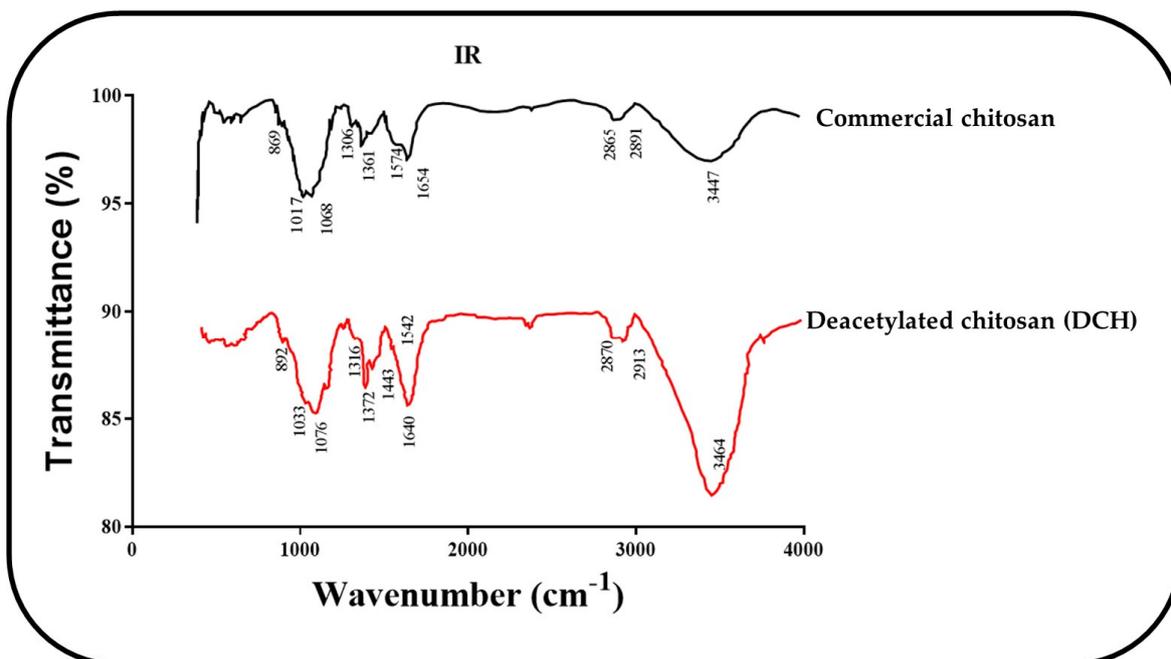
Fabian Pacheco <sup>1</sup>, Alejandro Barrera<sup>1</sup>, Yhors Ciro<sup>1</sup>, Dorian Polo<sup>2</sup>, Constain H. Salamanca<sup>3,4,\*</sup> and José Oñate-Garzón <sup>1\*</sup>

## Supplementary material



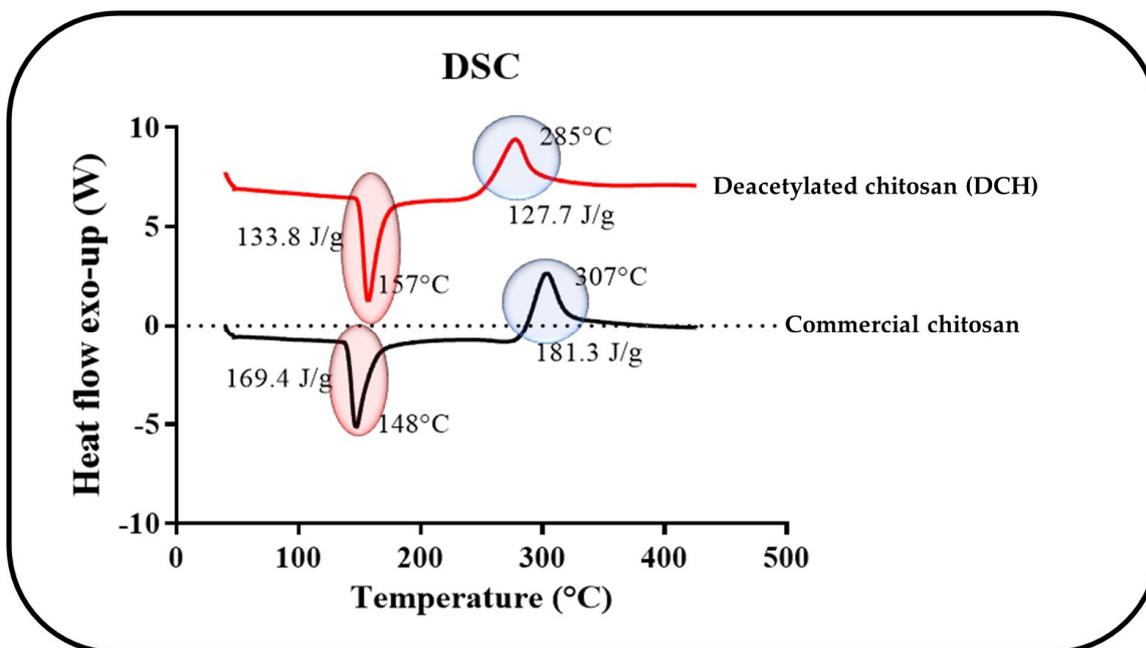
**Figure S1:** <sup>1</sup>H NMR spectra of chitosan with high degree of deacetylation (DCH)

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 H<sub>3</sub>-6 anomeric protons of the carbohydrate ring. The signal corresponding to H<sub>1</sub> (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 cm<sup>-1</sup>, 2913 cm<sup>-1</sup> and 2870 cm<sup>-1</sup> which are attributed to OH vibrations and C-H stretching, respectively. Moreover, it showed vibration bands at 1654 cm<sup>-1</sup> due to C=O stretching, and a shoulder due to the deacetylation process at 1542 cm<sup>-1</sup> attributed to the deformation of primary amine. Likewise, the peaks at 1443 cm<sup>-1</sup>, 1372 cm<sup>-1</sup> and 1316 cm<sup>-1</sup> are ascribed to CH<sub>2</sub> bending and CH deformation, C-CH<sub>3</sub> stretching, and secondary amide stretching, respectively. Further, the vibration signals at 1076 cm<sup>-1</sup>, 1033 cm<sup>-1</sup> and 892 cm<sup>-1</sup> 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.

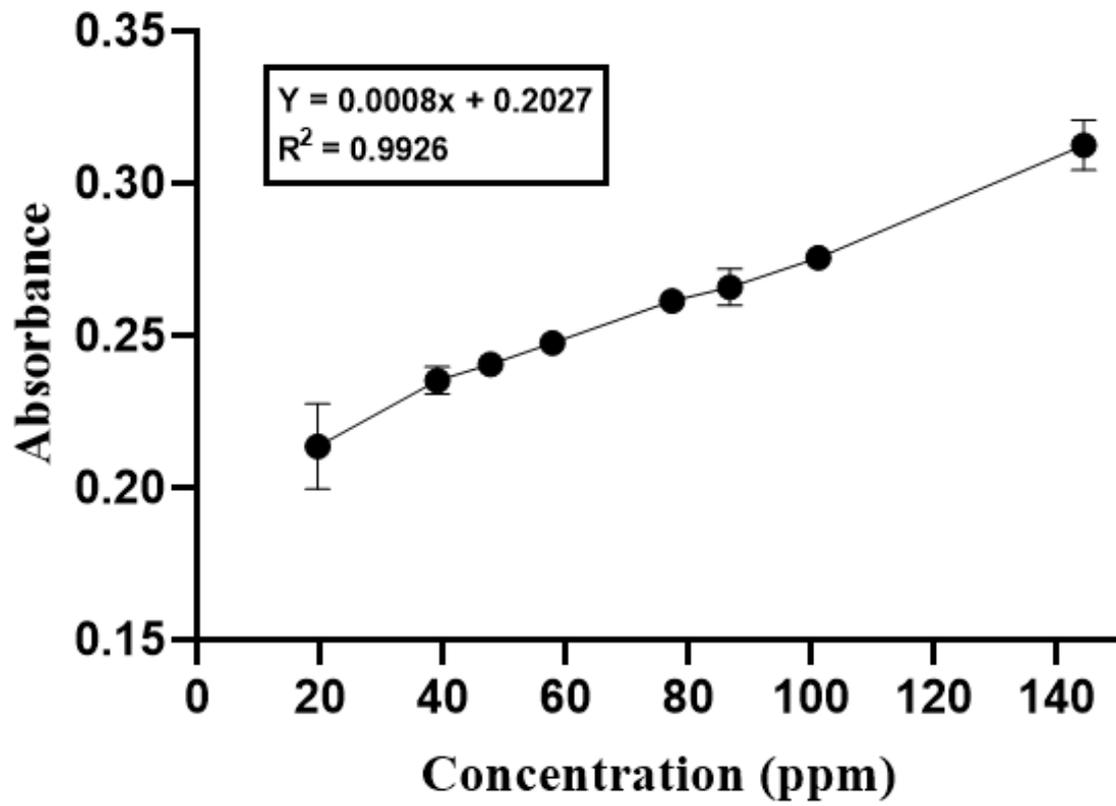


Figure S4: Calibration curve of colistin for calculating the encapsulation efficiency.