

**Preparation and characterization of ZnO-Chitosan
nanocomposite and evaluation of its antifungal activity
against pathogenic *Candida albicans***

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Nano technology is one of the fastest growing scientific tools with potential to solve many of the burning issues in bio medical sciences today. In this study, a simple, fast, cost-effective, wet chemical route based on cyclohexylamine was used to synthesizing Zinc oxide nanoparticles (ZnO NPs) in aqueous media. Synthesized ZnO NPs and low molecular weight chitosan were used to prepare Zinc oxide-chitosan nano composites (ZnO-C NCs). The synthesized ZnO NPs and ZnO- C NCs were characterized by powder X-ray diffraction, UV-visible diffuse reflectance spectroscopy, and field emission scanning electron microscopy (FESEM), field emission transmission electron microscopy (FETEM). The average particle size of ZnO NPs and ZnO-C NCs were 184 nm and 203 nm and zeta potential determined by zetasizer were +17.4 and +37.3 mV respectively. The anti-fungal properties of ZnO NPs and ZnO-C NCs against *Candida albicans* were determined by Minimum Inhibitory Concentration (MIC) which was determined as 200 µg/mL and 75 µg/mL respectively indicating superior anti-fungal properties of ZnO-C NCs compared to ZnO NPs. The SEM images of treated *C. albicans* cell surface, propidium iodide (PI) uptake and MTT assay results further confirmed the above statement. Concluding the results obtained from current study we strongly suggest that the ZnO-C NCs possess lucid anti candidal activity than ZnO NPs.

Keywords: ZnO; Chitosan; Nanocomposites; Antifungal activity; *Candida albicans*

Acknowledgements: This work was supported by a National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (2014R1A2A1A11054585).

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