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**Enhancing Using Glucose Encapsulation, the Efficacy of CdO NPs against Multi-Drug Resistant *Escherichia coli***

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**Abstract**

In this study, monodispersed, highly biocompatible and substantially stable glucose encapsulated CdO nanoparticles (G-CdO NPs) of uniform sizes were synthesized using a sol-gel route. In addition, naked CdO (n-CdO) NPs without any capping or surface functionalization were synthesized using the same method. These NPs were uniformly dispersed in an aqueous solution. The synthesis of G-CdO and n-CdO NP was confirmed by UV-Vis spectroscopy, transmission electron microscopy (TEM), zeta potential, and dynamic light scattering analyses. The average size of G-CdO and n-CdO NP was found to be  $17\pm 1$  and  $27\pm 1$  nm, under TEM, respectively. X-ray diffraction analysis of G-CdO and n-CdO NPs confirmed their sizes to be 18.83 and 28.41 nm, respectively, and revealed their cubic crystal structures with no impurity. The surface functionalization of G-CdO NPs with glucose was confirmed by Nuclear Magnetic Resonance and Fourier-transform infrared spectroscopy analyses. As per our knowledge, this is the first report to investigate the potencies of G-CdO and n-CdO NPs against gram-negative and gram-positive multi-drug resistant (MDR) bacteria. The minimum inhibitory concentrations of G-CdO and n-CdO NPs were 6.42 and

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