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## **Pollution and Global Warming**

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## Multifunctional nanocomposites of chitosan, silver nanoparticles, copper nanoparticles and carbon nanotubes for water treatment: Antimicrobial characteristics

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Multifunctional nanocomposites of chitosan with silver nanoparticles, copper nanoparticles and carbon nanotubes either as bior multifunctional nanocomposites were prepared. Change in the overall morphology of the prepared nanocomposites was observed; carbon nanotubes, Ag NPs and Cu NPs are distributed homogeneously inside the polymer matrix individually in the case of the bi-nanocomposites while a combination of different dimensional shapes; spherical NPs and nanotubes was observed in the multifunctional nanocomposite. Multifunctional nanocomposites has a higher antimicrobial activity, in relative short contact times, against both Gram negative and Gram positive bacteria; *E. coli, Staphylococcus aureus*; respectively in addition to the fungal strain; *Aspergillus flavus* isolated from local waste water sample. The nanocomposites are highly differentiable at the low contact time and low concentration; 1% concentration of the multifunctional nanocomposite is very effective against the tested microbes at contact time of only 10 min.

## Biography

Manal Moustafa Zaki is a Professor of Animal Hygiene and Management at the Faculty of Veterinary Medicine, Cairo University, Egypt. He is currently working as a Lecturer of the curricular poultry, animal hygiene and epidemiology for to veterinary students at Faculty of Veterinary Medicine, Cairo University, Egypt

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