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International Summit on NANOMEDICINE AND ROBOTICS

October 17-18, 2022 | Webinar

In-vivo (albino mice) and in-vitro assimilation and toxicity of zinc oxide nanoparticles in food materials

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Purpose: Recent advances in nanotechnology have given rise to the potential utilization of nanoparticles as food, nano-medicine /biomedicines. Patient: The study aimed to investigate the effects of nano-zinc oxide (nano-zinc) on the bio-assimilation of mineral (Zn) in mice, aged 3–6 weeks.

Methods: ZnO nanoparticles were added to the basal diet as a supplement at amounts of 0.07, 0.14 and 0.21 mg/kg. The synthesized material was characterized by Fourier transform infrared spectrophotometer, particle size, scanning electron microscope, Thermogravimetric Analysis Thermal, X-ray diffraction spectrophotometer and Zeta potential.

Results: In-vitro bioavailability of synthesized group ZnO (120 nm) was 43%, whereas for standard group ZnO (50 nm) was reported as 55%. In-vivo bioavailability of zinc oxide illustrated the maximum absorption level compared with the control. In-vivo toxicity was characterized as damage done to the liver and spleen tissues with a high dose of 0.21 mg/kg, while smaller doses indicated no toxic effects.

Conclusion: The study provided important insights on the toxicological effects of ZnO nanoparticles, depending on dose rate and bio-assimilation, as well as particles, under various conditions (in-vitro and in-vivo). These findings will motivate further detailed research on nano-based medicine for alleviating malnutrition conditions.

Biography

Dr. Saiqa Bashir has completed her PhD from University of Poonch Rawaakot, Azad Jammun and Kashmir, Pakistan. She is the Research Associate in the Department of Food Science and Technology, University of Poonch Rawaakot Azad Jammun and Kashmir, Pakistan. She has published 8 papers in reputed journals and has been serving as emerging scientiest.