

## The effect of shape of copper oxide nanoparticles on stability, dissolution and toxicity: Comparative study using nanospheres, nanorods, and spindles

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Copper oxide nanoparticles of three different shapes (spheres, rods and spindles) were prepared and characterised using a range of analytical techniques to examine the effect of shape on stability, dissolution and toxicity of the particles to alveolar type-1 (TT-1) cells. The synthesised particles showed high degree of suspension stability under neutral pH conditions, with no significant agglomeration within the tested temperature range (15-50°C). The shape of the particles affected the stability of the particles under varying pH conditions and the point of zero charge for the suspension was found to be different for each of the particle type. Long term (7 days) dissolution study on the copper oxide particles showed a significantly higher dissolution for spherical nanoparticles compared to the rest of the CuO particles. Dissolution study was also conducted at varying concentration to complement the biological study. Cytocompatibility studies showed shape and size of the particles to have a significant effect on cell viability and release of pro-inflammatory cytokines; IL-6, IL-8 and MCP-1. The results obtained in this study demonstrate that shape and dissolution of particles both have the potential to significantly contribute in toxicity of copper oxide particles towards alveolar type-I cells.

### Biography

Superb Misra completed his Ph.D. from Imperial College London (UK) after pursuing his BEng from The University of Manchester (UK). His doctoral thesis was on development of degradable polymer composites for biomedical applications. He is currently a Research Fellow at The University of Birmingham (UK) working on an EU project related to validation of methods for Nanosafety.

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