



▼ POST GRADUATES ABSTRACTS

PG -08 : EFFECTS OF CERIUM OXIDE NANOPARTICLES ON GLIOBLASTOMA: AN IN VITRO STUDY

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Background: Cerium oxide or ceria (CeO_2), a rare earth metal oxide. CeO_2 nanoparticles (CNPs) have received much attention in nanotechnology due to their useful applications as catalysts, fuel cells and antioxidants in biological systems [1]. CNPs, exhibit biomimetic properties depending on their size, ratio of valency on their surface, and the ambient physico-chemical properties.

Aim: To evaluate the cytotoxic effect of CNPs on U251 cells at pH 7.4 under normoxia (physiological) and pH 6.5 under 1.5% physiological hypoxia (tumor micro-environment) conditions.

Methods: The CNPs were synthesized at 6nm (CNP-6) and 12nm (CNP-12) sizes, characterized and glioma

cell lines were treated with these CNPs at varying concentration. The cytotoxicity assay was performed (MTT assay). Then IC_{50} value was determined and the GBM cells were treated with CNP-6 and CNP-12 under physiological and tumor micro-environment. Total RNA was extracted, converted to cDNA and Real-time PCR was done to determine the gene expression pattern of several metabolic genes.

Results: These CNPs also had a modulating effect on metabolic gene (GLUT 1,3,4, PKM, PFKP, MCT1,4) expression. In addition, The CNPs also exhibited peroxidase-like activity thus sensitizing the tumor cells towards chemotherapy, thus suggesting a promising tool for cancer therapy.