

# 8<sup>th</sup> World Medical Nanotechnology Congress & Expo

June 08-09, 2016 Dallas, USA

## Surface modification of biosynthesized ZnO nanoparticles by PEG and their antioxidant activity

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Using nanoparticles (NPs) for drug delivery to the brain is a method for transporting drug molecules across the blood brain barrier (BBB). These drugs cross the BBB and deliver pharmaceuticals to the brain for therapeutic treatment of neurological disorders including Alzheimer's disease. The metal nanoparticles such as zinc, gold and silver and oxides of zinc have great role in medical and biological applications. In the present study, zinc oxide nanoparticles (ZnONPs) were synthesized using the *Ocimum Tenuiflorum* extract and surface of ZnONPs was modified by a polymer reactant PEG (Polyethylene glycol). Structural, morphological, particle size and optical properties of the PEG coated ZnONPs have been characterized by using UV-Vis spectrophotometer, Fourier Transform Infrared (FTIR) spectroscopy, Field Emission Scanning Electron Microscope (FE-SEM), Energy Dispersive X-ray Spectroscopy (EDS or EDX), Zeta Potential and X-ray diffraction (XRD). The UV-Vis spectrum showed an absorption peak that reflects Surface Plasmon Resonance (SPR). The optical measurements were attributed to the band gap. Zeta potential determines the stability of the PEG coated ZnONPs. The antioxidant activity of PEG coated ZnONPs was also determined by Diphenylpicrylhydrazyl (DPPH) and reducing power assay. PEG coated ZnONPs showed maximum inhibition and absorbance. This study indicates that PEG coated ZnONPs may find use in the treatment of neuroinflammation, brain tumors and neurodegenerative disorders such as Alzheimer's disease where the blood brain barrier is compromised.

### Biography

B Deva Prasad Raju completed PhD in Physics from Sri Venkateswara University, Tirupati. Currently, he is working as an Associate Professor of Physics and also Director, University Science Instrumentation Centre, Sri Venkateswara University, Tirupati. He was awarded with Young Scientist award from DST, Govt. of India, New Delhi and also Scientist of the Year 2012 award from National Environmental Science Academy, New Delhi. He has published more than 50 articles in reputed journals with impact factor ranging from 2 to 5. He has received research grants from various organizations such as DST, DAE-BRNS, etc. He is currently involved in the field of luminescence technology, photonics and optoelectronic technology and nanotechnology. Five PhD degrees are awarded under his supervision.

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