

The Photodynamic Activity of Ag @ ZrO₂ Core – Shell Nanoparticles in Human Erythrocytes

Dhanalekshmi KI, Meena KS

Department of Chemistry, Queen Mary's College, Chennai, India.

Corresponding author email: ghanamveni88@gmail.com

From National Conference on Natural Products as therapeutics, Medical Microbiology, Nanobiology and System biology: Current Scenario & Emerging Trends, 'NATCON-2014'.

Post Graduate & Research Departments of Biochemistry, Microbiology, Biotechnology and Bioinformatics, Mohamed Sathak College of Arts & Science, Sholinganallur, Chennai-600119, India.

18-19 September 2014.

American J of Bio-pharm Biochem and Life Sci 2014 September, Vol. 4 (Suppl 1): P 89

ABSTRACT

Core-shell type Ag @ZrO₂ nanoparticles were prepared by one pot simultaneous reduction of AgNO₃ and hydrolysis of Zr(IV) isopropoxide. They were characterized by absorption spectroscopy, XRD and HR-TEM techniques. XRD patterns show the presence of ZrO₂ and the noble metal (Ag). High resolution transmission electron microscopic measurements revealed that their size is below 40 nm. Ag@ZrO₂-NPs are showing photodynamic activity in human erythrocytes. The photohemolysis induced by Ag@ZrO₂ core-shell type nanoparticles reveal that the percent hemolysis increased with the increase in concentration and light dose. The study of effect of scavengers, GSH and NaN₃ showed the formation of considerable amount of superoxide anion and singlet oxygen that caused cell death. The detailed mechanism has been discussed. Ag@ZrO₂ nano-photosensitizer being non-toxic, serves as proper substitute for the classical photosensitizers (organic dyes).