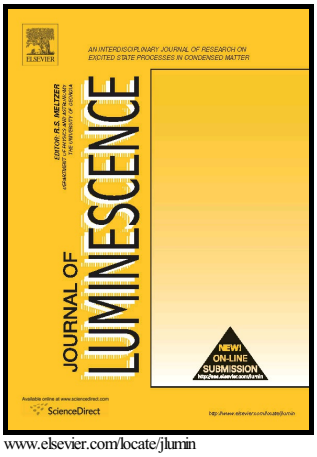
Author's Accepted Manuscript



www.elsevier.com/locate/jlumin

Revealing the interaction strategy of Diosmin functionalized gold Nanoparticles with ctDNA: Multi-Spectroscopic, Calorimetric and Thermodynamic approach

Riju K. Thomas, Surya Sukumaran, S. Prasanth, C. Sudarsanakumar

PII: S0022-2313(18)31149-9
DOI: https://doi.org/10.1016/j.jlumin.2018.09.004
Reference: LUMIN15887

To appear in: *Journal of Luminescence*

Received date: 27 June 2018
Revised date: 9 August 2018
Accepted date: 3 September 2018

Cite this article as: Riju K. Thomas, Surya Sukumaran, S. Prasanth and C. Sudarsanakumar, Revealing the interaction strategy of Diosmin functionalized gold Nanoparticles with ctDNA: Multi-Spectroscopic, Calorimetric and Thermodynamic approach, *Journal of Luminescence,* https://doi.org/10.1016/j.jlumin.2018.09.004

Revealing the interaction strategy of Diosmin functionalized gold Nanoparticles with ctDNA: Multi-Spectroscopic, Calorimetric and Thermodynamic approach

Riju K. Thomas, Surya Sukumaran, S. Prasanth, C. Sudarsanakumar*

School of Pure and Applied Physics, Mahatma Gandhi University Kottayam, Kerala, India, 686560.

*Corresponding author. Prof. C. Sudarsanakumar, School of Pure and Applied physics. Tel.: +91481-2731043; fax: +91 481 2730423; Mob: 09447141561. c.sudarsan.mgu@gmail.com

Abstract

The interactions of natural drug functionalized metal nanoparticles with DNA plays a pivotal role in developing effective therapeutic agents having a wide range of potential biomedical applications. The focus of this study was to decipher the binding mechanism of diosmin capped gold nanoparticles (DM-AuNPs) with calf thymus DNA (ctDNA) through a combination series of spectroscopic and calorimetric studies. The gold nanoparticles were successfully synthesized by the facile one-pot synthesis using DSM as a capping and reducing agent. The DM-AuNPs were characterized using UV-Visible spectroscopy, XRD, FTIR, DLS and HRTEM analysis confirming the formation of stable AuNPs with an average size of 30±3 nm. A series of experiments such as UV-Vis absorbance, fluorescence dye displacement studies, temperature melting and viscosity analysis unravelled the binding mode of DM-AuNPs by establishing a typical groove binding mode upon its complexation with ctDNA. The CD and FTIR measurements provided clear-cut evidences regarding the