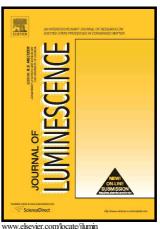
Author's Accepted Manuscript

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

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



PII: S0022-2313(18)31149-9

https://doi.org/10.1016/j.jlumin.2018.09.004 DOI:

LUMIN15887 Reference:

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 Luminescence, of https://doi.org/10.1016/j.jlumin.2018.09.004

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

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: +91481 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

Download English Version:

https://daneshyari.com/en/article/10147569

Download Persian Version:

https://daneshyari.com/article/10147569

<u>Daneshyari.com</u>