

Flavonoids loaded gold nanoparticles potentiating the anti-melanoma bio-efficacy of the plant *Madhucalongifolia* in B16F10 and A375 melanoma cell lines



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Abstract

In spite of significant progress dealing with cancer, it has remained as one of the main cause of death, in the worldwide. Due to the high rate of drug resistance and low bioavailability, recently, green nanotechnology, a new therapeutic approach emerged that focuses on the modern and traditional medicine to overcome this serious problem. This study was designed to resolve this problem, it has offered water-soluble and biocompatible nanoparticles loaded with flavonoids, which can improve the drug delivery and enhanced the bioefficacy. For this purpose, A family of flavonoids was ascertained as a bioactive principle in the aqueous-alcoholic the bark extract of the indigenous folk plant *Madhucalongifolia* (Sapotaceae family) using HPLC-ESI-QTOF-MS. The flavonoids loaded gold nanoparticles (F@AuNp) fabricated in a single green step; exploiting synergistic redox potential of extracted flavonoids and examined by UV-Vis spectroscopy, FE-SEM, TEM, XRD, EDX, and DLS techniques. In-vitro anti-melanoma bio-efficacy carried out against mice (B16F10) and human (A375) melanoma cell lines using MTT and SRB bioassays. The statistically significant anti-melanoma inefficacy has been explored (65.31%) in the bark extract. Noticeably, the native bark extract and F@AuNp may not show any significant toxicity towards the normal human lymphocyte cells highlighting their safe and non-toxic nature. Native bark extract exhibited anti-melanoma bioefficacy (65.31% and 66.74%) at the dose (50 μ g/ml) in B16F10 and A375 melanoma cell lines respectively. F@AuNp exhibited anti-melanoma bioefficacy (85.15% and 86.34%) at the dose (15 μ g/ml) against both the cell lines respectively. Statistically significant ($p < 0.05$) enhancement in anti-melanoma inefficacy with reduction of doses in anti-melanoma bioefficacy (16.36-19.84 %) has been successfully attempted through F@AuNp. The mechanistic pathway of observed anti-melanoma efficacy of F@AuNp has been discussed based on our experimental findings on percent inhibition of melanoma cells, production of intracellular reactive oxygen species, production of nitric oxide, and increase caspase-3 activities.



Biography:

Dr. Saurabh Yadav did M.Sc and M.Phil in Organic Chemistry from Dr. B.R. Ambedkar University, Agra, India and pursuing PhD in Chemistry from Department of Chemistry, Faculty of Science, Dayalbagh Educational Institute, Dayalbagh, Agra India. He is engaged in the research under the domains of Natural product, Green Chemistry and Green nanotechnology. He is a recipient of UGC-BSR fellowship in Science for Meritorious Students and published his research papers in the International journal of repute.

Speaker Publications:

1. "Benzothiohenes as Potent Analgesics Against Neuropathic Pain"; Journal of Advances in experimental medicine and biology Vol-1112, 2018.
2. "Evaluation of benzothiohenecarboxamides as analgesics and anti-inflammatory agents"; Journal of IUBMB life, VL - 66, 2014.
3. "Simvastatin Induced Neurite Outgrowth Unveils Role of Cell Surface Cholesterol and Acetyl CoA Carboxylase in SH-SY5Y Cells"; Surface Cholesterol and Acetyl CoA Carboxylase in SH-SY5Y Cells. PLoS ONE 8(9); Vol-8, 2013.

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