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Biosynthesis of Silver Nanoparticles Using *Tridax procumbens* Aqueous Leaf Extract and Their Antiproliferative Activity Against Cancer Cell Lines

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Natural products have been considered more sustainable over chemical drugs, those have failed either due to severe side effects or drug resistance. Green synthesis of metal-nanoparticles using medicinal plants extract is gaining attention due to profound applications for secondary metabolite, those are natural products. Present study describes antiproliferative activity of silver nanoparticles synthesized using the aqueous leaf extract of *Tridax procumbens*. Aqueous leaf extract of *T. procumbens* served as a reducing and capping agent in biosynthesis of silver nanoparticles. The biosynthesized *T. procumbens* silver nanoparticles (TNPs) were characterized using UV-visible spectroscopy, dynamic light scattering (DLS), Fourier transform infrared (FTIR) spectroscopy, X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and energy-dispersive X-ray analysis (EDAX). The phytochemicals responsible for the reduction and capping of biosynthesized TNPs were deciphered through separation and mass spectrometry principles. Antiproliferative activity of TNP was evaluated using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay on a few selected cell lines; A549, and B16 F10 immortal, while HEK293 being the finite cell line. Cellular cytotoxicity assay demonstrated that TNPs exhibits antiproliferative activity against both, A549 and B16F10 with IC50 values 42.70ug/ml and 2.64ug/ml, respectively. Molecular characterization of TNPs synthesized using *T. procumbens* crude extract and HPLC fraction-11 showed presence of differential phytochemicals. The HPLC fraction originated TNPs showed presence of fosinopril and reducing agents such as peptides (Gln-Gly-Ala, Ser-Pro-Asn, and Leu-Met), terpenoids (lupanyl acid, tiamulin), polyphenol (peucenin), and alkaloids (8,10-dihydroxydihydroergotamine, carteolol) phytochemicals, suggesting potential role to the dipeptides/tripeptides in cancer therapy. To decipher antiproliferative mechanism exerted by the TNP in A549 cells was studied with RNA sequencing approach. Monolayer treated with 10 ug along with non-treated monolayers were subjected for RNA sequencing. Primary analysis indicated 15 genes were upregulated while 17 genes were downregulated in the cells treated with 10 ug TNP.

Keywords: Antiproliferative, diphenyltetrazolium bromide, phytochemicals, fosinopril.

Biography

Nilesh Makwana is a Microbiologist and graduate student at School of life Sciences, Jawaharlal Nehru University (JNU), New Delhi. My research work on medicinal plant, its Anti-cancer and Anti-microbial potentiality. Cancer is a leading growing global public health concern. There has been a sufficient scientific advent, which owes to research in last six decades, however, still search of a miraculous anticancer compound is yet to be achieved. My work involves, green synthesis of silver Nanoparticles doped with *Tridax procumbens* phytochemicals. The nanoparticles exhibited an anticancer potentiality against A549 -a human lung carcinoma cells (Pungle et. al., 2022).

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