The Torch
Vol. 2 (2)

Gold nanoparticles for cancer therapy

Bhavana NV

In recent years, gold nanoparticles (AuNPs) have gained much interest in oncology owing to their unique physical, chemical and optical properties. AuNPs are gold particles of nanosize range (1-100 nm), which once dispersed in water form colloidal gold. They possess some unique properties, such as high biocompatibility, low toxicity, large surface to volume ratio, easy surface modification, etc. which make them get widely employed in biomedical applications. Different sized and structured AuNPs, such as spherical, rod-shaped, etc. could be easily synthesised through various methods; each of which has different optical properties and cellular uptake. AuNPs have high surface plasma property and high photothermal efficiency which have gained interest in bioimaging. They are usually used as bioimaging agents because of their combinational properties of both diagnosis and therapy. Tumour therapy using gold nanoparticles is performed by photothermal therapy where AuNPs get accumulated specifically at tumour site first and through the external field, they are heated up to destroy the cancerous cells. In light scattering-based imaging, gold nanoparticles can scatter light with a cross-section more than 1 million times stronger than that of emission from a fluorescent dye. Gold nanoparticles’ application is seen in photoacoustic imaging too owing to their photothermal conversion ability and tunable optical properties. X-RAY based imaging, particularly computed tomography that is widely used for diagnostics in cancer imaging employs gold nanoparticles as imaging contrast agents. Through active targeting strategies, gold nanoparticles are surface functionalised to selectively image tumours. In cancer drug delivery, gold nanoparticles could be used as nanocarriers as they have high loading capacity, low toxicity, high biocompatibility and easy surface functionalisation. The AuNPs are potential as tumour sensors and cancer drug delivery agents and have hence gained much popularity in cancer research for its eradication.

Keywords: Gold nanoparticles, Oncology, Optical properties, Surface plasma property, Biocompatibility, AuNPs, Cancer diagnosis, Tumour sensors, Cancer imaging, Cancer drug delivery

Citation:
Bhavana NV. Gold nanoparticles for cancer therapy. The Torch. 2021. 2(2). Available from:
https://www.styvalley.com/pub/magazines/torch/read/gold-nanoparticles-for-cancer-therapy.