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Effect of pegylated gold nanoparticle core size on cancer cell uptake

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The development of polymer functionalized gold nanoparticles (GNPs) have promoted prospective applications in cancer diagnostics and therapeutics, such as drug delivery, photodynamic therapy and radiation therapy. The use of polyethylene glycol (PEG) functionalized GNP conjugates (PEG-GNP) have gained much attention due to promising biodistribution and stealth properties *in vivo*. Conjugates have decreased cellular uptake *in vitro*, suggesting localization in interstitial space rather than intercellularly in tumor regions *in vivo*. The dependence of PEG-GNP uptake on GNP size was studied *in vitro* in HeLa cells for a PEG molecular weight of 2000 to determine a preferred core size between 20 nm and 50 nm spherical GNPs. Cellular uptake was observed quantitatively by inductively coupled plasma atomic emission spectroscopy and qualitatively by hyperspectral imaging. PEG-GNP uptake was found independent of core size. Core size may be changed should particular PEG-GNP applications require specific GNP diameters without affecting uptake.

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