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# In vitro and in vivo anticancer activity of surface modified paclitaxel attached hydroxyapatite and titanium dioxide nanoparticles.

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### Abstract

Targeted drug delivery using nanocrystalline materials delivers the drug at the diseased site. This increases the efficacy of the drug in killing the cancer cells. Surface modifications were done to target the drug to a particular receptor on the cell surface. This paper reports synthesis of hydroxyapatite and titanium dioxide nanoparticles and modification of their surface with polyethylene glycol (PEG) followed by folic acid (FA). Paclitaxel, an anticancer drug, is attached to functionalized hydroxyapatite and titanium dioxide nanoparticles. The pure and functionalised nanoparticles are characterised with XRD, TEM and UV spectroscopy. Anticancer analysis was carried out in DEN induced hepatocarcinoma animals. Biochemical, hematological and histopathological analysis show that the surface modified paclitaxel attached nanoparticles have an higher anticancer activity than the pure paclitaxel and surface modified nanoparticles without paclitaxel. This is due to the targeting of the drug to the folate receptor in the cancer cells.

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