doi: 10.4274/jus.2016.03.030

Re: Engineered Nanoparticles Induce Cell Apoptosis: Potential for Cancer Therapy

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Oncotarget 2016:2. doi: 10.18632/oncotarget.8553. [Epub ahead of print]

EDITORIAL COMMENT

Engineered nanoparticles (ENPs) have been widely applied in industry, biology and medicine recently (i.e. clothes, sunscreens, cosmetics, foods, diagnostic medicine, imaging and drug delivery). There are many kinds of manufactured nanomaterial products including TiO_2, ZnO, CeO_2, Fe_2O_3, and CuO (as metal oxide nanoparticles) as well as gold, silver, platinum and palladium (as metal nanoparticles), and other carbon-based ENP's such as carbon nanotububes and quantum dots. ENPs with their sizes no larger than 100 nm are able to enter the human body and accumulate in organs and cause toxic effects. In many researches, ENP effects on the cancer cells of different organs with related cell apoptosis were noted (AgNP, nano-Cr_2O_3, Au-Fe_2O_3 NPs, nano-TiO_2, nano-HAP, nano-Se, MoO_3 nanoplate, Realgar nanoparticles). ENPs, with their unique properties, such as surface charge, particle size, composition and surface modification with tissue recognition ligands or antibodies, has been increasingly explored as a tool to carry small molecular weight drugs as well as macromolecules for cancer therapy, thus generating the new concept "nanocarrier". Direct induction of cell apoptosis by ENPs provides an opportunity for cancer treatment. In the century of nanomedicine that depends on development of the nanotechnology, ENPs have a great potential for application in cancer treatment with minimal side effects.

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