few studies, some nanoparticles have been suggested to change the expression of some apoptotic genes. In our study, we evaluated the epigenetic changes in some apoptosis-related genes in human cervical carcinoma (HeLa) cell lines treated with a wide concentration range of (10, 40,125, 500 μg/ml) of 2-mercaptopropionic acid (2-MPA)-coated silver sulfide QD by real-time polymerase chain reaction (RT-PCR) assay. The RT-PCR results showed that 2-MPA QD at the concentrations 10–500 μM affected the apoptotic genes (bax, bcl2 and caspase-9) in HeLa cells. However, more genes related to apoptosis should further be examined to understand the possible apoptotic mechanisms of QDs.

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P17-045
In vivo genotoxicity and inflammatory effects of uncoated and coated CeO_2 NPs in mice

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Ceria nanoparticles (CeO_2 NPs) have several industrial applications and pharmacological potential due to their antioxidant properties. However, toxicity data on CeO_2 NPs are scarce and show contradictory results. In the present study, uncoated, polyethylene glycol- and citrate-coated CeO_2 NPs (4-8 nm) were administrated to C57Bl/6 mice by repeated dose (3×) pharyngeal aspiration using four different doses of each type of NPs (corresponding to 4.4, 8.8, 17.6 and 35.2 μg Ce^{2+}/mouse/aspiration), and sampled 1 and 28 days after the last administration. DNA damage was assessed by the comet assay locally in bronchoalveolar lavage (BAL) and lung cells, and systemically in liver cells. Micronuclei, a biomarker of chromosome damage, were analysed in bone marrow and peripheral blood erythrocytes. Immunotoxicity was evaluated by BAL cell counting. Furthermore, histopathological effects on the lungs and biodistribution of the NPs (analysis of Ce^{2+} in several organs) were assessed. At 24-h, a significant increase in DNA damage was induced at the highest doses by uncoated and citrate-coated NPs in BAL cells. For these NPs a significant, but non-dose-dependent, effect was observed in lung and liver cells at 28-d. No systemic genotoxic effects were observed with any of the NPs. A dose-dependent accumulation of macrophages and activated lymphocytes was seen in the lungs for all the NPs, although a milder reaction was elicited by the coated NPs. Our findings show that short-term exposure of mice to CeO_2 NPs induces pulmonary inflammation, and non-dose-dependent DNA damage, but no systemic genotoxicity. (Funded by the EU FP-7 GUIDEnano, Grant Agreement No.604387).

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P17-046
Genotoxicity of iron oxide nanoparticles assessed by chromosomal aberration assay "*in vitro*"

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Iron oxide nanoparticles (Fe_2O_3-NPs) have been widely used for various biomedical applications such as drug delivery, magnetic resonance imaging contrast enhancement, and in the targeted destruction of tumor tissue through hyperthermia. Increasing applications raise concerns over their potential effects on human health so their effects, including genotoxic effects, need to be thoroughly understood. The present study was planned to determine the genotoxic effect of Fe_2O_3 NPs in cultured human lymphocytes using the chromosomal aberration (CA) assay. Lymphocytes were treated with different concentrations (39.062, 78.125, 156.250, 312.500 μg/mL) of Fe_2O_3 NPs (Sigma–Aldrich, <100 nm) for 24 h and 48 h. The results show that NPs increased the frequency of CAs at both 24 h and 48 h. This increase was significant at 156.250 and 312.500 μg/mL at 24 h ($r = 0.88$) and at only 312.500 μg/mL at 48 h treatment ($r = 0.94$). On the other hand, Fe_2O_3 NPs decreased the mitotic index, this decrease was significant at the highest concentration (312.500 μg/mL) at 24 h and at the two highest concentrations (156.250 μg/mL, 312.500 μg/mL) at 48 h. The results observed in this study indicated that Fe_2O_3 NPs may have clastogenic and cytotoxic effects at high concentrations. While NPs toxicity can be considered useful for cancer therapy, simultaneously it seems harmful for non-cancer cells. Recent studies show that NPs can cause epigenetic and genomic changes which may stimulate cancer progression. So, attention should be paid for the use of nanoparticles and some more study on the genotoxicity of Fe_2O_3 NPs is necessary.

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P17-047
Assessment of the *in vitro* effects of some new betulinic acid nanoformulations

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Betulinic acid is a compound of natural origin, member of the pentacyclic triterpenes family, known to exert multiple pharmacological properties, like: antitumoral, anti-inflammatory, antiangiogenic, immunomodulatory, hepatoprotective and other effects. It was also proved that even at high doses administered *in vivo* (500 mg/kg body weight), no toxicity was observed. A major handicap of this compound is represented by its very low water solubility what leads to a diminished administration *in vivo*. The aims of the present study were to obtain a silver nanoparticle solution of betulinic acid soluble in aqueous solution and to assess the effects of this new formulation *in vitro* on a panel of tumor cell lines.

The experiments were conducted on human melanoma – A375, murine melanoma – B164A5, lung (A549) and liver carcinoma (HepG2) and breast cancer carcinoma – MCF-7 cell lines. The cells