Nanogenotox, an EU Project aiming to define robust protocols to estimate the genotoxic potential of nanomaterials

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The interesting physicochemical properties of the newly produced nanomaterials have led to the rapid expansion of their use and, consequently, toward an increased risk of environmental release and to its consequent human exposure. Thus, exposure to nanoparticles is certainly occurring at present, and it is expected to increase in the near future due to the growth of the nanotechnology industry. The physicochemical properties of nanomaterials may suppose new harmful biological responses that must be carefully studied. Of particular interest are their possible genotoxic effects.

Since it is not clear if classical protocols of genotoxicity are appropriate for the genotoxicity testing of nanomaterials, an EU project has been launched to determine which assay and cell type produce better results with these new materials.

In a first stage, two assays (Comet and Micronucleus) and six different cell types (Caco-2, BEAS-2B, 16HBE, NHEK, A549 and human lymphocytes have been used to test 14 different nanomaterials (4 silica dioxides, 4 titanium dioxides and 6 carbon nanotubes). Twelve groups participate in this *in vitro* study. This first stage will end with a robin test to define the best cell line, best assay and the appropriate protocol to test nanomaterials.

In the first stage, the group at the UAB has used BEAS-2B, 16HBE and Caco-2 cells to test 10 nanomaterials (4 silica oxides and 6 carbon nanotubes) using the comet assay complemented with the use of the formamidopyrimidine-DNA glycosylase enzyme (FPG).

The results indicated that, with the exception of one carbon nanotube (NM401 in Caco-2 cells) and one silica nanomaterial (NM200 in 16HBE cells), all the results obtained in the comet assay are negative.

According to the inconclusive results obtained during the first stage experiments, for the round robin test experiments two cell lines have been selected: Caco-2 and BEAS-2B, two assays: comet and micronucleus and three nanomaterials (one of each). Six groups will work with the Caco-2 cell line and the other six with the BEAS-2B cell line.