INTERACTION OF SILVER NANOPARTICLES WITH DIFFERENTIATED CACO-2 CELLS MONOLAYERS

[1]Vila L., [1]García-Rodríguez A., [1]Cortés C., [1,2]Marcos R., [1,2]Hernández A.

[1]Grup de Mutagènesi, Departament de Genètica i de Microbiologia, Facultat de Biociències, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Spain.

[2]CIBER Epidemiología y Salud Pública, ISCIII, Spain.

constanza.cortes@uab.cat

In the past few years, nanoparticles (NPs) have revolutionized consumable goods, becoming an important asset of their production, as well as a component of the supplies themselves. In particular, AgNPs have gained popularity in pharmaceutical and food industry supplies, given its antimicrobial properties. However, the internalization mechanism and the actual risk posed by these NPs have not been fully elucidated yet. Ingestion is one of the main entry routes of xenobiotics. As such, the use of an *in vitro* model mimicking the enteric epithelium as target model could assess the hazard of AgNPs. To this end, the human colon adenocarcinoma Caco-2 cell line has been used due to its capability to differentiate and form a well-structured cell monolayer.

In this study, we have used the aforementioned model to evaluate different parameters that could be altered by AgNPs exposure, such as cell viability, the monolayer integrity, and permeability, as well as cellular uptake and translocation of the NPs. Induction of DNA damage, both genotoxic and oxidative, as well as expression of different genes coding for specific markers of differentiated enterocytes were also evaluated.

The obtained results show that no significant effects were observed on the integrity and permeability of the monolayer after AgNPs exposure, although cellular uptake was demonstrated by confocal microscopy. Despite this, no translocation to the basolateral chamber was observed with any of the different experimental approaches used. The genotoxic effects evaluated using the comet assay indicate that AgNPs exposure induces a significant increase in the levels of oxidative DNA damage, although it was not able to induce direct DNA breaks, at the tested conditions.