

## **Evaluation of the genotoxic effects of polymeric nanoparticles designed to cross biological barriers**

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Orally administrated biotechnological drugs have to deal with numerous problems including crossing biological barriers in order to reach the epithelium at therapeutic concentrations without being toxic for the organism. In order to reach penetration through these biological barriers, biodegradable polyanhydride nanoparticles (NPs) have been synthesized with different types of ligand making varying physicochemical properties.

The purpose of this work was to evaluate the genotoxicity of different biodegradable polyanhydride NPs by the comet assay in combination with the enzyme formamidopyridine DNA-glycosylase (FPG). Furthermore, the mitogen capacity of the NPs was evaluated by the proliferation assay.

NPs were tested at different concentrations (0, 0.5, 1 and 2 mg/mL) in Caco-2 cells with a treatment period of 3 h. The comet assay was performed immediately after the treatment and cell proliferation was assessed by counting the cells after their incubation at 37 °C for 48h. Caco-2 cells treated with 1 µM of the photosensitiser Ro 19-8022 plus 5 min of light were included as positive control in all the experiments.

The NPs studied did not result in any increase in the frequency of strand breaks or alkali-labile sites in Caco-2 cells but they induced a slight concentration-dependent increase in net FPG sensitive sites (oxidized and/or alkylated bases). Treated cells showed similar levels of proliferation (100% of control levels) with all evaluated NPs.

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