Biocompatibility of platinum nanoparticles: study in neuronal cells and *Drosophila melanogaster*

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Platinum nanoparticles (PtNP) have attracted increasing interest in the biomedical field due to their unique properties, offering a wide range of applications ranging from diagnosis to therapy. However, despite their promising potential, the toxic effects of PtNP and their cellular and molecular impact remain largely unknown. With this in mind, the present study aimed to discard possible *in vitro* and *in vivo* effects of PtNP on the SH-SY5Y neuroblastoma cell line and on the model organism *Drosophila melanogaster*. For the *in vitro* evaluation, MTT test, comet assay and challenge-comet assay were employed to evaluate cytotoxic and genotoxic effects. The *in vivo* study with *D. melanogaster* included analysis of morphological alterations in both larvae and adult individuals chronically exposed, as well as behavioural evaluation by the crawling assay in third-instar larvae. Results obtained revealed decreases in viability of SH-SY5Y cells exposed to PtNP but limited to the highest doses tested. No effects on viability, DNA damage or DNA repair were observed at biological relevant doses according to MTT, comet assay and challenge-comet assay analyses, respectively. After chronic oral exposure to PtNP, our study revealed no significant difference in size in *D. melanogaster* individuals, neither adults or larvae. However, behavioural alterations were observed for exposed larvae that showed dose-dependent significant decreases in their mobility. These initial findings point to a high biocompatibility of PtNP, but some hints of *in vivo* effects under the experimental conditions tested support the need of further investigation before PtNP can be safely used in biomedical applications.

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