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MEETING ABSTRACT

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Effects of titanium dioxide nanoparticles on growth of malignant melanoma cells

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Background: Malignant melanoma (MM) is one of the most common cancers worldwide. At present, the (pharmaco)therapy is far from being optimal. Titanium dioxide (TiO₂) is one of the most widely used nanomaterials in everyday life and has emerged as a potential killer of malignant cells. Extensive studies have shown that it can cause cell toxicity under *in vitro* and *in vivo* conditions. Accordingly, the aim of our study was to investigate the influence of nano-TiO₂ on the growth of MM cells.

Methods: The human metastatic MM cell line WM 266-4 (ATCC) was used to obtain dose- and time-dependent responses. The MTT assay was carried out to measure the cells' metabolic activity and viability. In addition, an LDH cytotoxicity assay was performed. The cells (3x 10³) in the 7th passage were seeded into 24-well culture plates in duplicates, incubated overnight in ATCC-formulated EMEM medium and then treated with various concentrations of nano-TiO₂ (250, 100, 20, 10, 1 µg/mL) for 24, 48 and 120 hours without changing the media.

Results: The MTT test showed a significant increase in the MM cells' metabolic activity and viability after 48 hours of exposure regardless of the nano-TiO₂ concentration. After 120 hours of exposure, only in case of 250 and 100 µg/mL nano-TiO₂ concentrations, a marked decrease in the cells' metabolic activity and viability was observed. The LDH test confirmed findings from the MTT test; cytotoxic effects of nano-TiO₂ on MM cells were higher at higher nano-TiO₂ concentrations and longer times of exposure.

Discussion: In conclusion, our results suggest that nano-TiO₂ may markedly impair the growth of WM 266-4 cells and thus might open a new window in treatment modalities of MM. However, a significantly increased MM metabolic activity and viability after 48 hours of exposure was observed. This discrepancy raises questions which have to be answered before a potential clinical use of nano-TiO₂.

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