PP-254

Evaluation of Genotoxic Effects of Needle-Like TiO_2 Nanoparticles in Human Lymphocytes *in vitro* by Sister Chromatid Exchange Assay

Nur KORKMAZ, Deniz YÜZBAŞIOĞLU, Fatma ÜNAL
Department of Biology, Science Faculty, Gazi University, 06500, Ankara-Turkey
nurkorkmaz241@gmail.com

Aim of the study: Nanoparticles are widely used in electronics, textiles, food, pharmacy, medicine and many other areas. However, these particles accumulate on the nature and on the living beings and threaten biodiversity. One of these nanoparticles, titanium dioxide(TiO_2 NPs) is widely used in laminate, food packaging, paint, textile, toothpaste, sun protectors, food additive, pharmacy, medical diagnosis and drug delivery. However, recent studies show that TiO_2 NPs have genotoxic effects on different cell and cell lines.The aim of this study is to investigate genotoxic effect of needle-like TiO_2 NPs by using sister-chromatid exchange (SCE) assay in cultured human lymphocytes.

Materials and Methods: Lymphocytes obtained from two healthy donors were treated with different concentrations (100, 200, 300, 400, and 500 µg/ml) of needle-like TiO_2 NPs for 24 and 48 h. A negative (ultra-distilled water) and a positive control (Mitomycin-C, MMC) were also maintained. Data obtained from the treatment groups were compared with the negative and positive controls by using Student's t-test. This study was approved by the Ethics Committee of Gazi University Faculty of Medicine (No: 276, 05/09/2016).

Results: Needle-like TiO_2 NPs did not increase the frequency of SCEs at both 24 and 48 h treatment periods in human lymphocytes. This study indicated that needle-like TiO_2 NPs did not induce sister chromatid exchange and cause mutagenic effects in cultured lymphocytes. While some studies show that TiO_2 NPs induce genotoxic effects in different cell and cell lines, some other studies reveal any damage. These differences may be originating from differences in the forms, shapes, and sizes of TiO_2 NPs, as well as differences in repair mechanism and cell line resistance.

Acknowledgements: Thanks to Prof. Dr. Halil İbrahim ÜNAL for donating needle-like TiO_2 NPs that were synthesized in his laboratory.

Keywords: Needle-like TiO_2 nanoparticles, genotoxicity, sister chromatid exchange, human lymphocytes