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Effect of TiO2 nanoparticles on adipose derived stromal cell differentiation, morphology, ECM deposition and its susceptibility to bacterial infections. TATSIANA MIRONAVA, YAN XU, MIRIAM RAFAILOVICH, Stony Brook University — The growing annual production of Titanium dioxide (TiO_2) nanoparticles is proportional to an increase in the chances of occupational and consumer exposure. Considering, that these nanoparticles are currently being used in multiple personal care products many concerns have arisen about their health impact. Human skin is in constant contact with the external environment and is one of the most important routes of exposure to TiO_2. In this study we have investigated the effect of two forms of TiO_2, rutile and anatase, on human adipose derived stromal cells (ADSCs). Here, we focus on the effects of TiO_2 exposure on intracellular lipid accumulation and expression of adipogenic markers; on whether different forms of TiO_2 have similar effects on cell function; and whether nanoparticle localization inside cells correlates with loss of cell function. In addition presence of bacteria on the skin is taken into account in its complex interaction with ADSCs and TiO_2 nanoparticles. Altogether, the present study indicates that nanosized TiO_2 particles adversely effects the differentiation of ADSCs, have profound effects on cell function and increase the rate of bacterial infection.

Tatsiana Mironava
Stony Brook University

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