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The Effect of Titanium Dioxide Nanoparticles on Keratinocyte Cell (KC) and Squamous Cell Carcinoma (SCC-13) CHIENHSIU LIN, SUNY-Stony Brook U., MARCIA SIMON, VLADIMIR JURUKOVSKI, WILSON LEE, MIRIAM RAFAILOVICH, DEPARTMENT OF MATERIALS SCIENCE & ENGINEERING, STONY BROOK UNIVERSITY, STONY BROOK, NEW YORK COLLABORATION, DEPARTMENT OF ORAL BIOLOGY & PATHOLOGY, STONY BROOK UNIVERSITY, STONY BROOK, NEW YORK COLLABORATION, ESTEE LAUDER CORP., MELVILLE, NEW YORK COLLABORATION
— We have studied the effects of TiO_2 nanoparticles on cell keratinocyte and SCC (Squamous Cell Carcinoma) cells. We found that the concentration of particles required to adversely affect the cells was many times higher for keratinocyte than SCC cells. Confocal microscope shows that the particles in keratinocyte culture are sequestered in membranes between the cell colonies. The particles penetrated into the cells in the case of the SCC cells. TEM images revealed very few particles in the keratinocyte, many more particles were observed sequestered in vacuole of the SCC cells. These results indicate that the keratinocyte layer behaves very different from the fibroblast layers which are much more sensate to TiO_2 nanoparticle damage and may suggest a protection mechanism of the dermal tissue. The effect of UV exposure in the presence of DNA was also investigated. We found that adsorbed proteins, as well as grafted polymer provided a measure of protection against free radical formation. The effects of low level UV exposure when the particles are near in-vitro cell culture will be presented.

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