

Abstract Submitted
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Exposure to TiO₂ nanoparticles increases *Staphylococcus aureus* infection of HeLa cells YAN XU, State Univ of NY- Stony Brook, MING-TZO WEI, Lehigh University, STEPHEN.G WALKER, HONG ZHAN WANG, CHRIS GONDON, PETER BRINK, State Univ of NY- Stony Brook, SHOSHANA GUTERMAN, Yeshiva University High School for Girls, EMMA ZAWACKI, University of California at Los Angeles, ELIANA APPLEBAUM, Stern College for Women, MIRIAM RAFAILOVICH, State Univ of NY- Stony Brook, H. DANIEL OU-YANG, Lehigh University, TATSIANA MIRONAVA, State Univ of NY- Stony Brook — TiO₂ is one of the most common nanoparticles in industry from food additives to energy generation. Even though TiO₂ is also used as an anti-bacterial agent in combination with UV, we found that, in the absence of UV, exposure of HeLa cells to TiO₂ nanoparticles largely increased their risk of bacterial invasion. HeLa cells cultured with low dosage rutile and anatase TiO₂ nanoparticles (0.1 mg/ml) for 24 hrs prior to exposure to bacteria had 350% and 250% respectively more bacteria infected per cell. The increase was attributed to increased LDH leakage, and changes in the mechanical response of the cell membrane. On the other hand, macrophages exposed to TiO₂ particles ingested 40% fewer bacteria, further increasing the risk of infection. In combination, these two factors raise serious concerns regarding the impact of exposure to TiO₂ nanoparticles on the ability of organisms to resist bacterial infection.

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