

# Do titanium dioxide particles from orthopedic implants disrupt bone repair?

14 September 2017



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Researchers from the Mayo Clinic have proposed that negative cellular responses to titanium-based nanoparticles released from metal implants interfere in bone formation and resorption at the site of repair, resulting in implant loosening and joint pain. Their review of recent scientific evidence and call for further research to characterize the biological, physical, and chemical interactions

between titanium dioxide nanoparticles and bone-forming cells is published in *BioResearch Open Access*.

Jie Yao, Eric Lewallen, PhD, David Lewallen, MD, Andre van Wijnen, PhD, and colleagues from the Mayo Clinic, Rochester, MN and Second Affiliated Hospital of Soochow University, China, coauthored the article entitled "Local Cellular Responses to Titanium Dioxide from Orthopedic Implants The authors examined the results of recently published studies of [titanium](#)-based implants, focusing on the direct and indirect effects of titanium dioxide nanoparticles on the viability and behavior of multiple bone-related cell types. They discuss the impact of particle size, aggregation, structure, and the specific extracellular and intracellular (if taken up by the cells) effects of titanium particle exposure.

"The adverse effects of metallic orthopedic particles generated from implants are of significant clinical interest given the large number of procedures carried out each year. This article reviews our current understanding of the clinical issues and highlights areas for future research," says *BioResearch Open Access* Editor Jane Taylor, PhD, MRC Centre for Regenerative Medicine, University of Edinburgh, Scotland.

Research reported in this publication was supported by the National Institutes of Health under Award Numbers R01 AR049069 and F32 AR068154. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

**More information:** Jie J. Yao et al, Local Cellular Responses to Titanium Dioxide from Orthopedic Implants, *BioResearch Open Access* (2017). [DOI: 10.1089/biores.2017.0017](https://doi.org/10.1089/biores.2017.0017)

Provided by Mary Ann Liebert, Inc

APA citation: Do titanium dioxide particles from orthopedic implants disrupt bone repair? (2017, September 14) retrieved 25 June 2019 from <https://medicalxpress.com/news/2017-09-titanium-dioxide-particles-orthopedic-implants.html>

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