Silk-based devices with antisense-miRNA therapeutics may enhance bone regeneration

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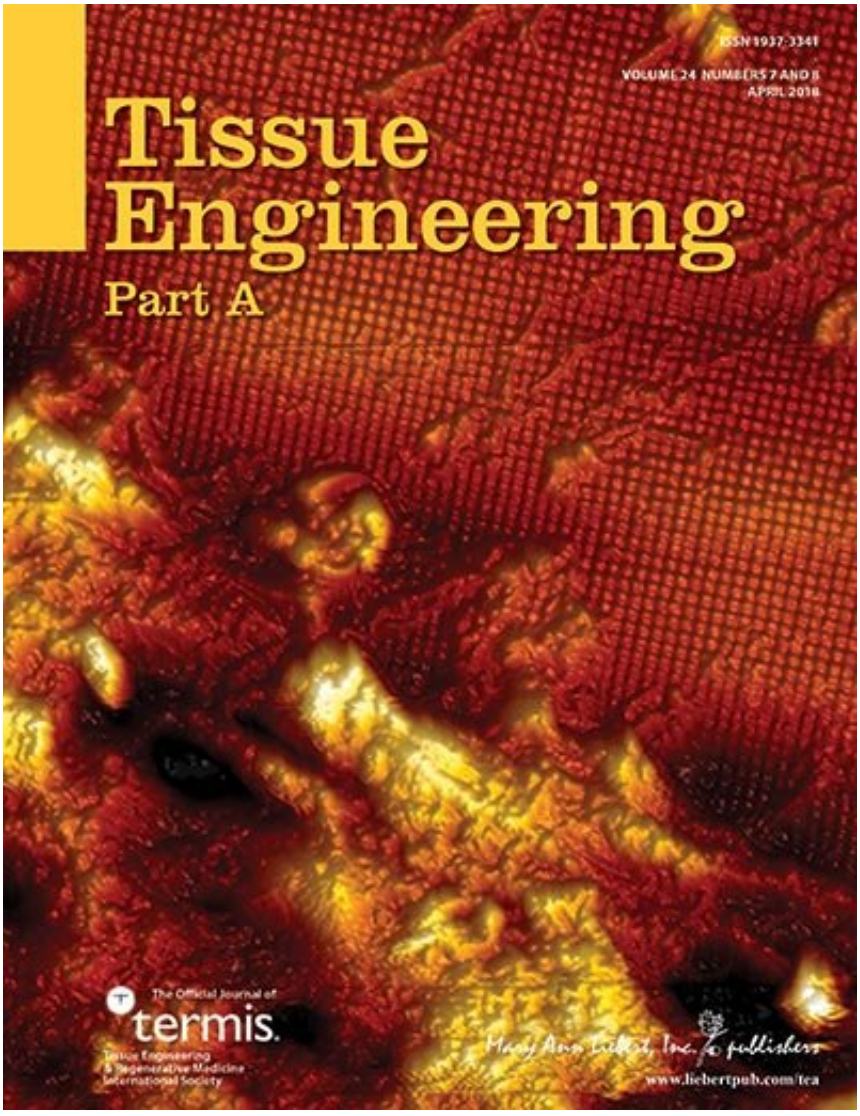

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Researchers have incorporated therapeutic microRNAs (miRNAs) into bioresorbable, silk-based medical devices such as screws and plates to achieve local delivery of factors that can improve bone growth and mineralization at the site of bone repair. The study, which demonstrated the promise of silk-based orthopedic devices combined with bioactive miRNA-based therapeutics, is published in *Tissue Engineering, Part A*.

Eric James, Emily Van Doren, Chunmei Li, and David Kaplan, Tufts University, Medford, MA describe the method they used to deliver the antisense therapeutic miR-214 in the article entitled "Silk Biomaterials-Mediated miRNA Functionalized Orthopedic Devices." The article is part of an upcoming special issue of *Tissue Engineering* on "RNA Therapeutics for Tissue Engineering" led by Guest Editors Elizabeth Balmayor, PhD, Technical University of Munich, Germany and Christopher Evans, PhD, DSc, Mayo Clinic, Rochester, MN.

The researchers coated the surface of bioresorbable silk-based devices used in bone repair with antisense-miR-214 and also studied the use of antisense-miR-214 silk films seeded with human mesenchymal stem cells (hMSCs). The results showed that miR-214 was released continuously for up to 7 days in vitro and could block the production of proteins that downregulate new bone formation.

"This study leverages tissue engineering principles for the design of medical devices with enhanced biocompatibility," says *Tissue Engineering* Co-Editor-in-Chief Antonios G. Mikos, PhD, Louis Calder Professor at Rice University, Houston, TX.

More information: Eric James et al, Silk Biomaterials-Mediated miRNA Functionalized Orthopedic Devices, *Tissue Engineering Part A* (2018). DOI: 10.1089/ten.TEA.2017.0455

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