Bone regrowth using ceramic substitute and E. coli-derived growth factors

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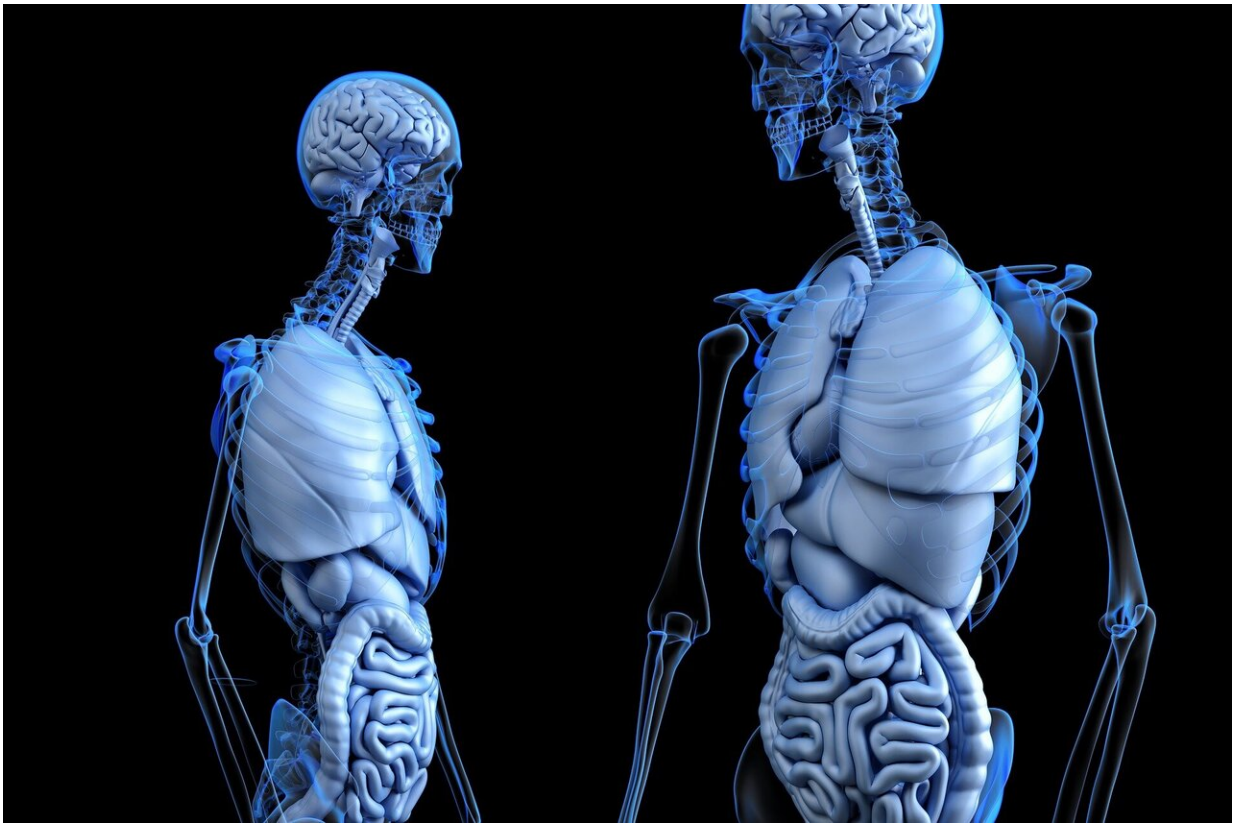

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Synthetic bone substitutes are promising materials for bone defect repair, but their efficacy can be substantially improved by bioactive agents such as growth factors. In a new study, researchers have modified

beta-tricalcium phosphate (β-TCP) with increasing quantities of bone morphogenetic protein 2 (BMP-2) derived from *E. coli* and shown improved bone healing. The study is published in *Tissue Engineering*.

Yuelian Liu, Ph.D., Academic Center for Dentistry Amsterdam, Amsterdam, Netherlands, and colleagues present their work in an article titled "Dose Effects of Slow-Released Bone Morphogenetic Protein-2 Functionalized β-Tricalcium Phosphate in Repairing Critical-Sized Bone Defects".

The authors created bone defects in a rat calvarial model and then attempted repair using β-TCP granules coated with a biomimetic calcium phosphate preparation that allows slow release of BMP-2. Bone growth and maturation were studied in comparison with autologous bone grafts using micro-CT scans, histology, and histomorphometry, and toxicity was assessed with blood tests. The *E. coli*-derived BMP-2 successfully improved bone formation with efficacy comparable to autologous grafts, and higher BMP-2 concentration promoted bone maturation.

"The dosage effect of *E. coli*-derived BMP-2 on bone formation provides valuable information for researchers and commercial stakeholders interested in a more cost-effective BMP-2 source compared to traditional mammalian cell production," says *Tissue Engineering* Co-Editor-in-Chief Antonios G. Mikos, Ph.D., Louis Calder Professor at Rice University, Houston, TX. "In addition, the application of a biomimetic coating system presented by the authors is crucial for translating these findings into transformative clinical bone regeneration strategies."

More information: Lingfei Wei et al, Dose Effects of Slow-Released Bone Morphogenetic Protein-2 Functionalized β-Tricalcium Phosphate in Repairing Critical-Sized Bone Defects, *Tissue Engineering Part A*

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