

PROCEEDINGS

Electrically Assisted Stereolithography 3D Printing of Graded Composites for Biomedical Applications

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ABSTRACT

Graded composites have broad applications in biomedical fields, including tissue engineering, interventional scaffolds, and implants. However, conventional manufacturing technologies are often inadequate for fabricating multifunctional graded composites. Herein, we demonstrate that a single composite feedstock, combined with electrically assisted stereolithography-based 3D printing, enables the realization of a wide range of material properties and high-resolution three-dimensional graded architectures. Compared with pure resins and uniformly dispersed filler-resin composites, the manufactured graded composites better mimic natural biological structures, reproducing the heterogeneity and gradient properties of native tissues. The proposed electrically assisted stereolithography technique, together with the fabricated graded composites, offers a promising strategy to advance biomedical engineering by meeting patients' individualized needs.

KEYWORDS

Stereolithography; multifunctional graded composites; biomedical applications

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