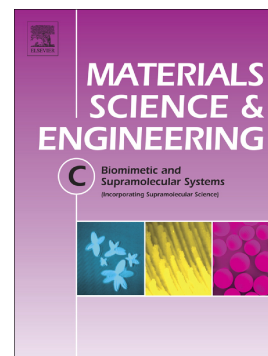


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Fiber-Reinforced Colloidal Gels as Injectable and Moldable Biomaterials for Regenerative Medicine

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Abstract

Hydrogels are the preferred material choice for various strategies in regenerative medicine. Nevertheless, due to their high water content and soft nature, these materials are often mechanically weak, which limits their applicability. This study demonstrates mechanical reinforcement of colloidal gels at microscale using discrete polyester fibers, as confirmed by rheological, compression and nanoindentation tests. This reinforcement strategy results into injectable and moldable colloidal gels with improved mechanical performance. The fully organic gels presented here are cytocompatible and can maintain their mechanical integrity under physiological conditions. Consequently, these gels exhibit a strong potential for applications in tissue engineering and regenerative medicine.

Keywords: Colloidal gel; Fiber reinforcement; Injectable gel; Moldable gel; Self-healing; Regenerative medicine

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