

Supporting Information

Dynamic stiffening collagen-coated substrate enhances osteogenic differentiation of mesenchymal stem cells through integrin $\alpha 2\beta 1$

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1. Materials and methods

1.1. Mechanical test of hydrogels implanted *in vivo*

All animal experiments were approved by the Ethic Committee of Chongqing University and were conducted according to institutional animal ethics guidelines for the Care and Use of Research Animals established by Chongqing University, China. Animals were anesthetized with 10% v/v chloral hydrate. The Low, High and Dynamic hydrogels were implanted into Sprague-Dawley rats' back. The animals were sacrificed and the Low and High hydrogels were retrieved after 7 days, the Dynamic hydrogel was retrieved after 3, 5 and 7 days. Mechanical properties of the static and dynamic stiffness hydrogels were measured using a compression testing instrument (Instron-E1000, USA). To measure compressive modulus, the upper platen was lowered at a compressive speed of 1 mm/minutes. The Young's modulus was obtained in the strain range from 1% to 10% of the stress–strain curve.

2. Supplementary Figures

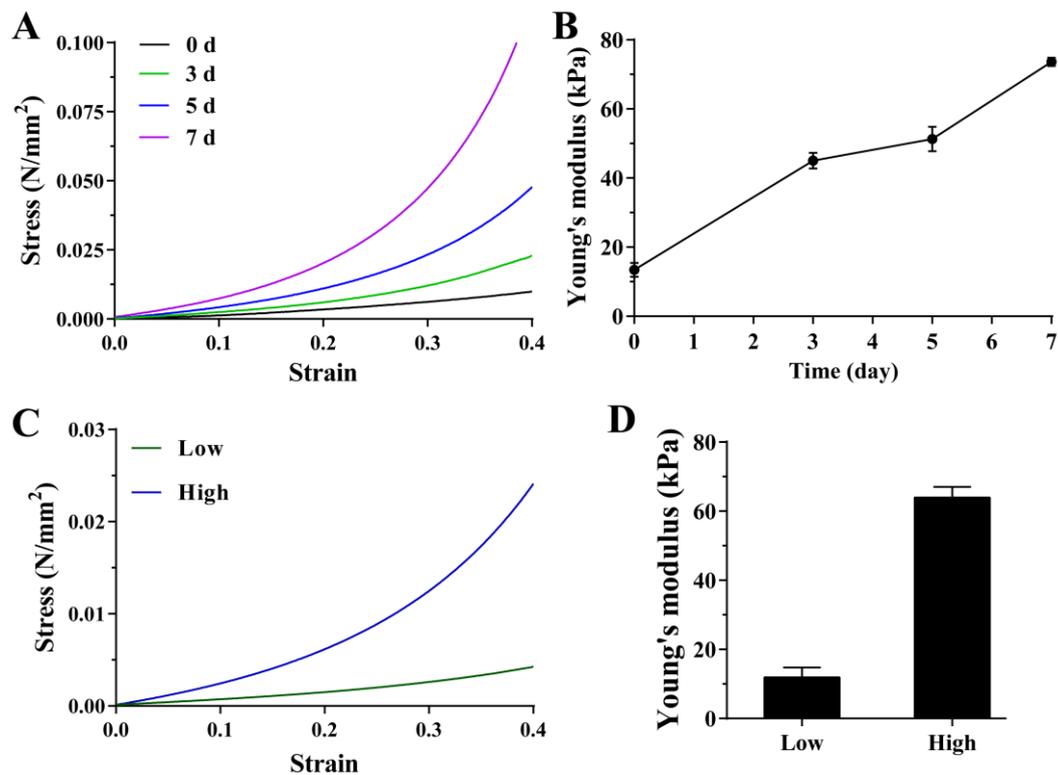


Figure S1. The mechanical characterization of the low, high and dynamic hydrogels *in vivo*. (A) Stress-strain curve of dynamic hydrogel. (B) Young's modulus of dynamic hydrogel. (C) Stress-strain curve of low and high hydrogels. (D) Young's modulus of low and high hydrogels. * $p < 0.05$.