

Supporting Information

**Sulfonate Hydrogel-siRNA Conjugate Facilitates Osteogenic Differentiation of Mesenchymal Stem Cells by Controlled Gene Silencing and Activation of BMP Signaling**

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Table S1. Primer information for qRT-PCR

<b>Gene</b>	<b>Forward</b>	<b>Reverse</b>
<i>GAPDH</i>	AGGTCGGTGTGAACGGATTTG	TGTAGACCATGTAGTTGAGGTCA
<i>Noggin</i>	GCCAGCACTATCTACACATCC	GCGT CTCGTTTCAGATCCTTCTC
<i>Runx2</i>	CGGTCTCCTTCCAGGATGGT	GCTTCCGTCAGCGTCAACA
<i>ALP</i>	GTTGCCAAGCTGGGAAGAACAC	CCCACCCCGCTATTCCAAAC
<i>OCN</i>	GGGAGACAACAGGGAGGAAAC	CAGGCTTCCTGCCAGTACCT
<i>Gremlin</i>	CGCAGCCGCACCATCCTCAA	CGAGACCCGGGCATTCGAGC
<i>Chordin</i>	TCAAGTTTACGCTTCTCTGTCTCCTA	AGGATGTTGCCTGTGGGATCT
<i>BMP-2</i>	CGGACTGCGGTCTCCTAA	GGGGAAGCAGCAACACTAGA
<i>Smad5</i>	CCAGCCGTGAAGCGATTGT	CTCCTCCATAGCACCTTCT
<i>Id1</i>	AACGGCGAGATCAGTGCCTT	AACGGCGAGATCAGTGCCTT

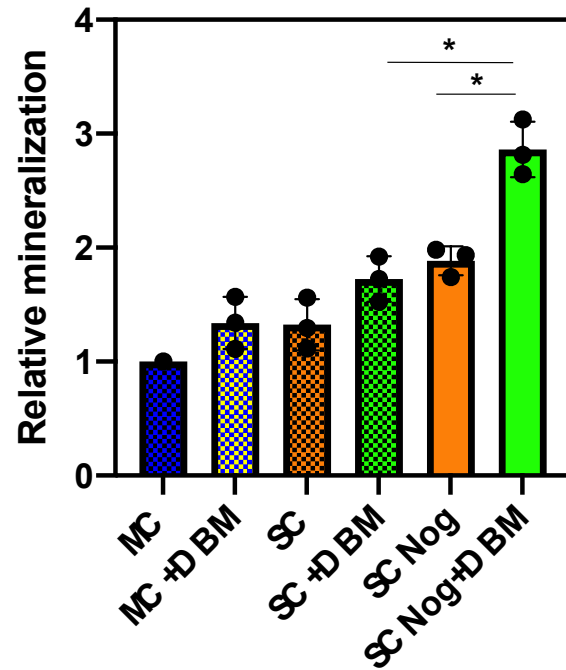


Figure S1. Relative mineralization of DBM incorporated hydrogels with sulfoacetic acid and noggin siRNA conjugation at day 21.  $*p < 0.05$ .

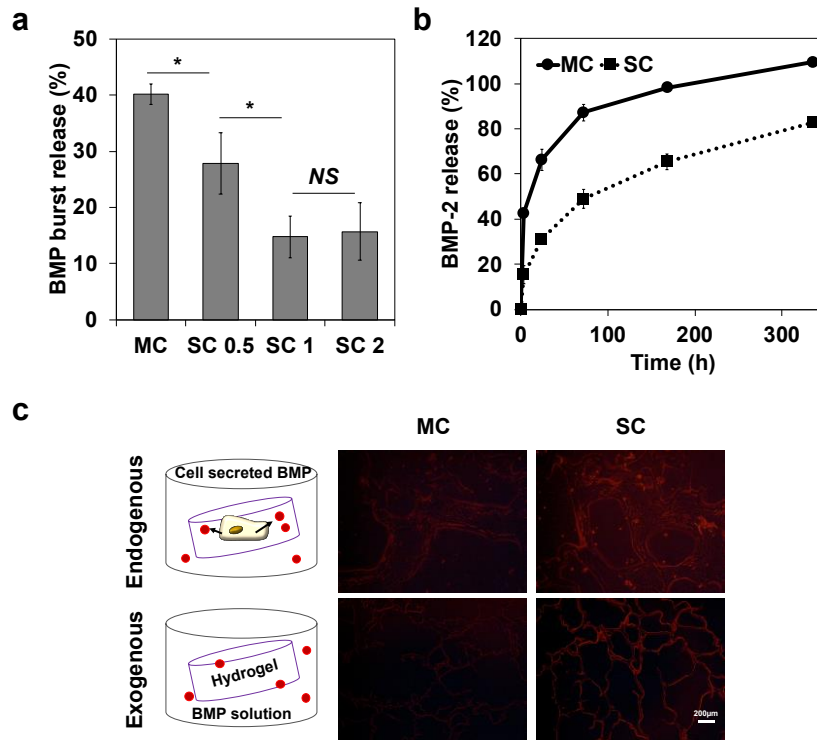


Figure S2. a) Initial burst release of BMP with different sulfoacetic concentrations.  $*p < 0.05$ . b) BMP-2 release profile of MC and SC hydrogels for 14 days. c) Exogenous and endogenous BMP sequestering images obtained by immunostaining.

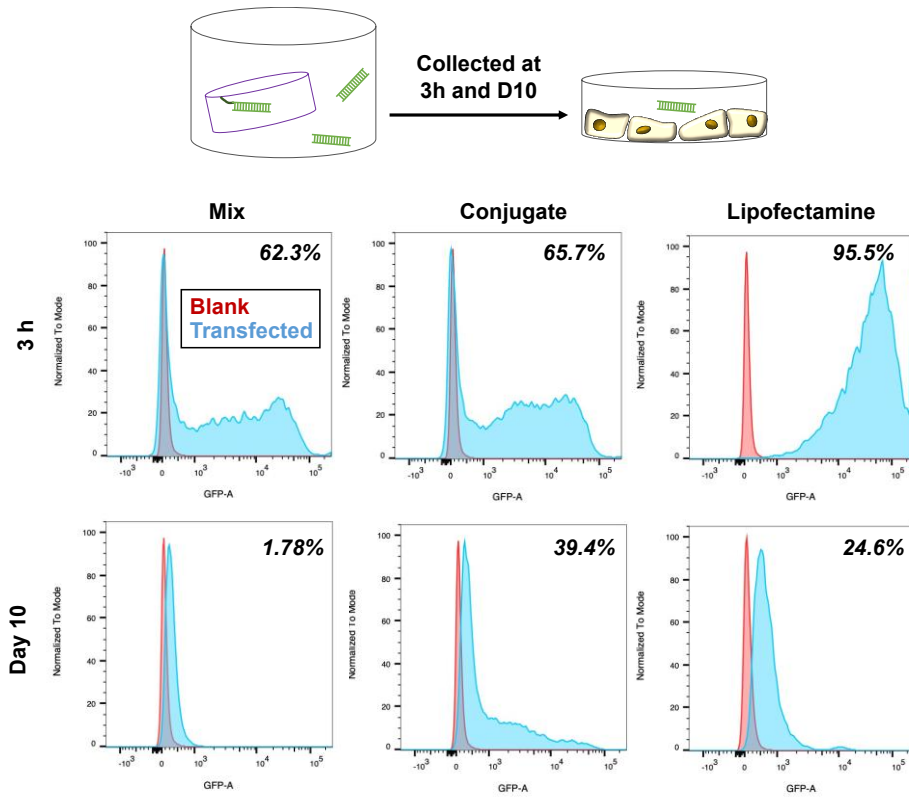


Figure S3. 2D transfection experiments by collecting the releasates of siRNA from hydrogels at 3 h and 10 days and flow cytometry histogram. Transfection results of siRNA delivered by lipofectamine was provided as a control.

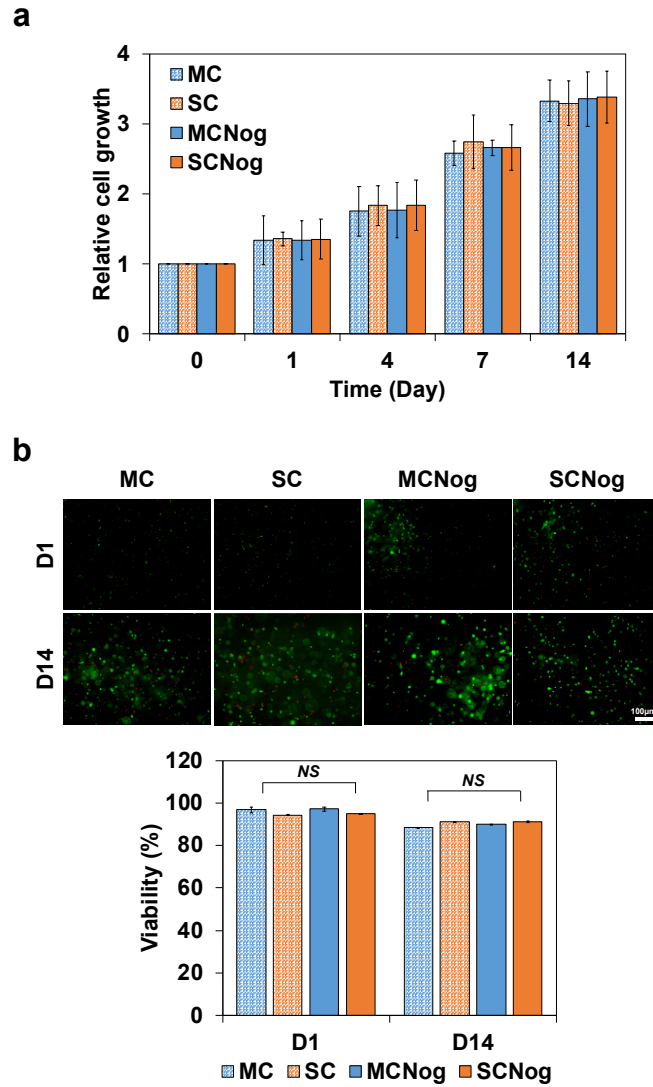


Figure S4. a) Relative cell growth of BMSCs encapsulated in hydrogel-siRNA conjugate measured by alamarBlue assay. b) Representative live/dead images of BMSCs encapsulated in hydrogel-siRNA conjugate and the quantified viability analyzed by ImageJ. NS = not significant.

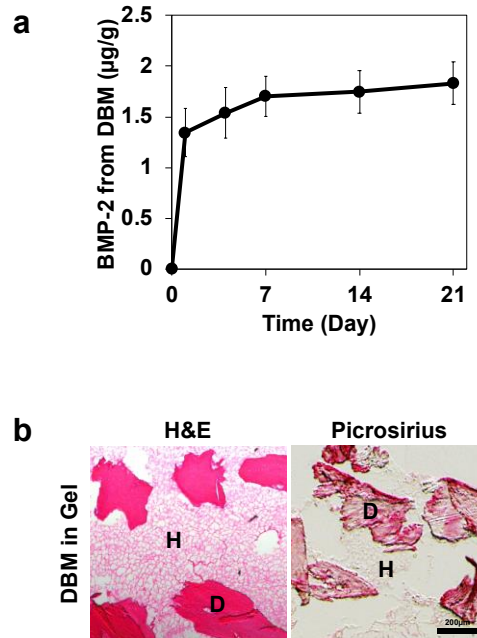


Figure S5. (a) BMP-2 release profile from DBM for 14 days quantified by BMP-2 ELISA. (b) Histology of DBM incorporated hydrogel with H&E and picrosirius staining. H indicated hydrogel and D indicated DBM. H&E staining exhibited the localization of DBM and the red color stained from picrosirius staining pointed out the existence of collagen in DBM, while hydrogel part was not stained.