

Supporting Information

Injectable and degradation heterogeneous microgel assembly capable of forming "micro-nest group" for cell condensation and cartilage regeneration

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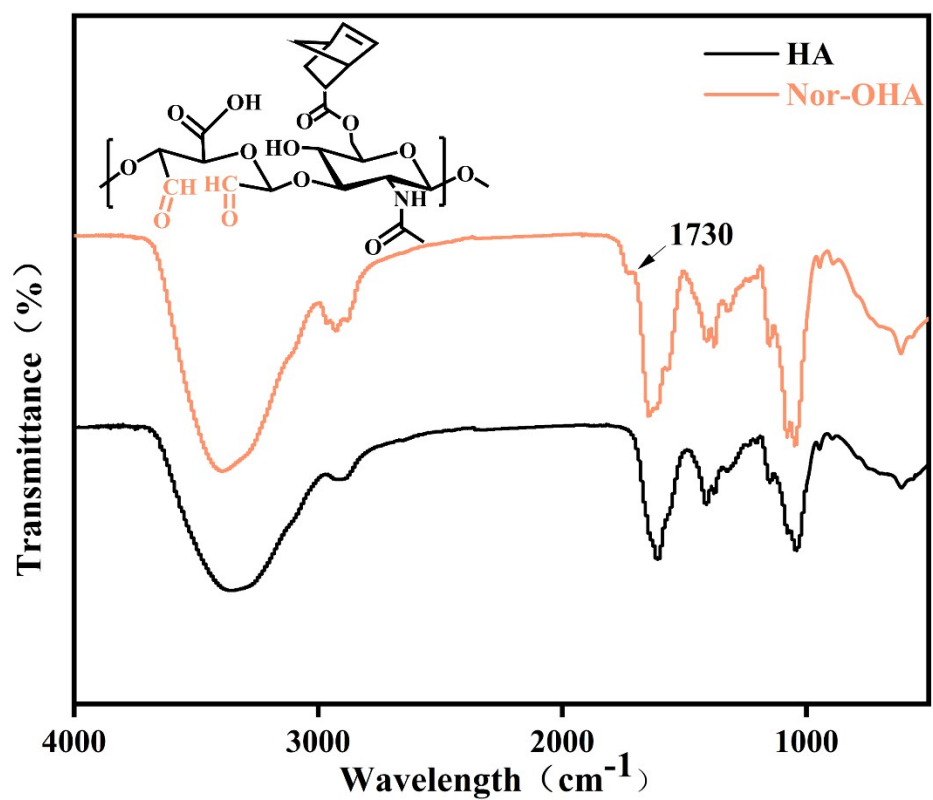
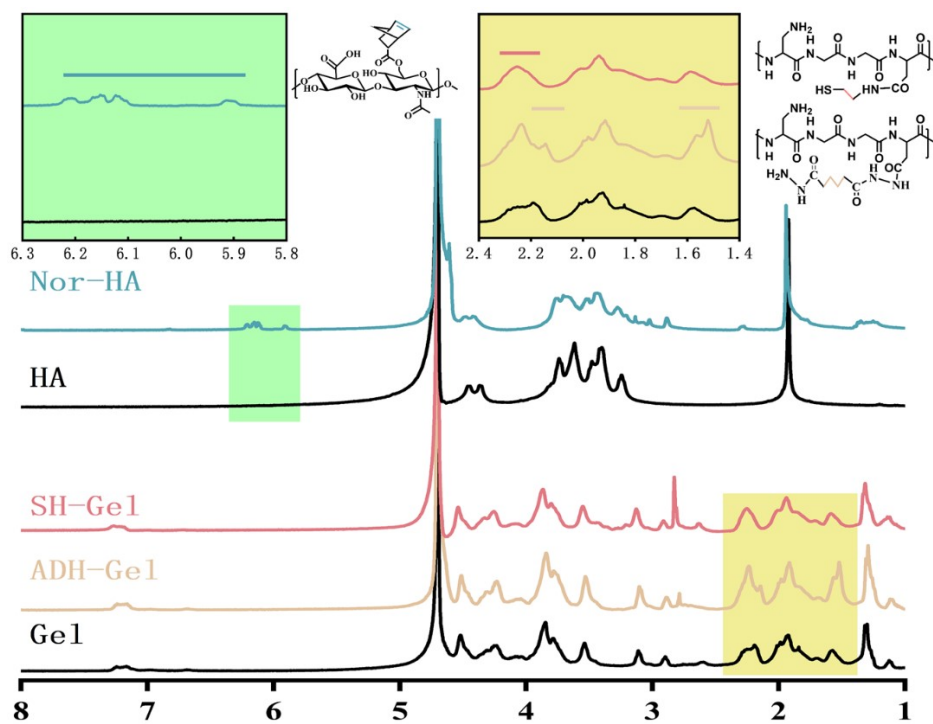


Figure S1. ^1H NMR spectra of Nor-HA, ADH-Gel and SH-Gel, and IR spectra of Nor-OHA.

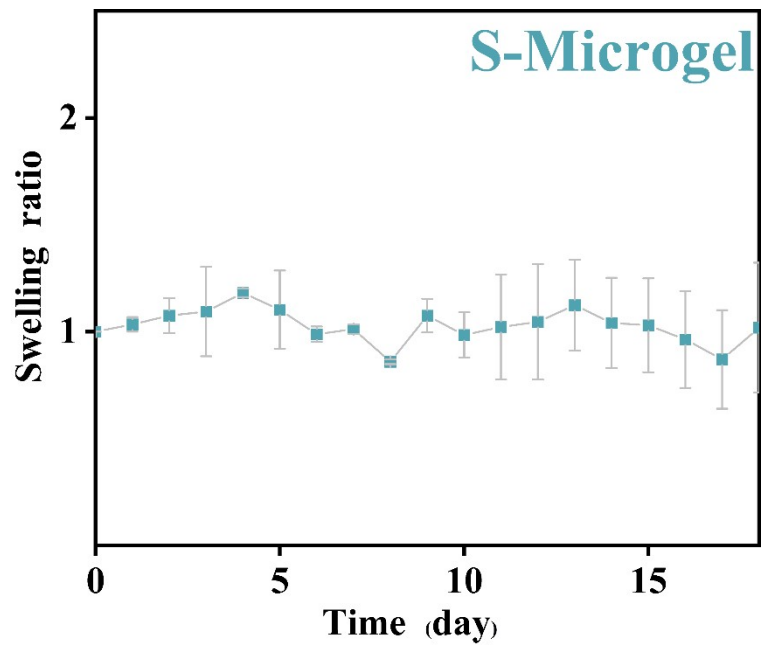


Figure S2. Swelling of S-microgel.

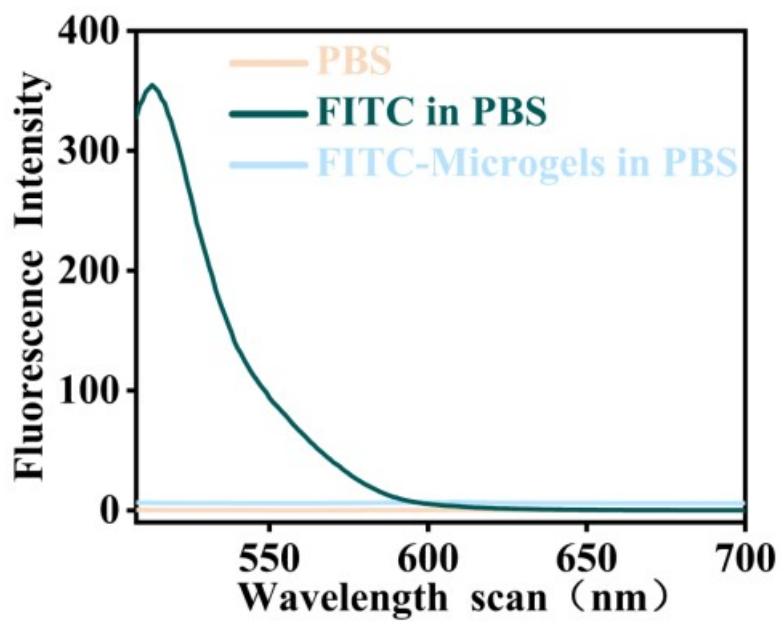


Figure S3. Fluorescence spectrum of FITC-PEG-SH loaded S-microgels.

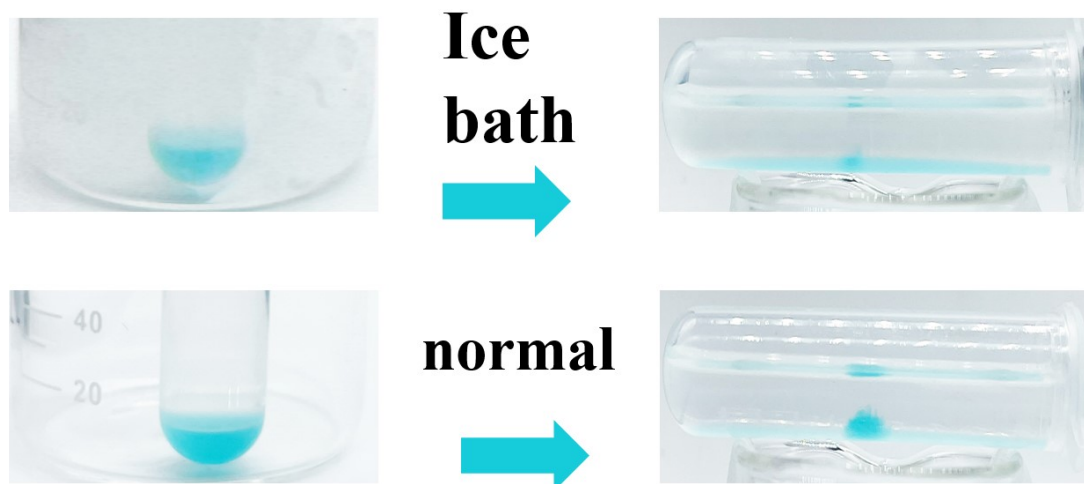


Figure S4. State of F-microgels at room temperature and in ice bath.

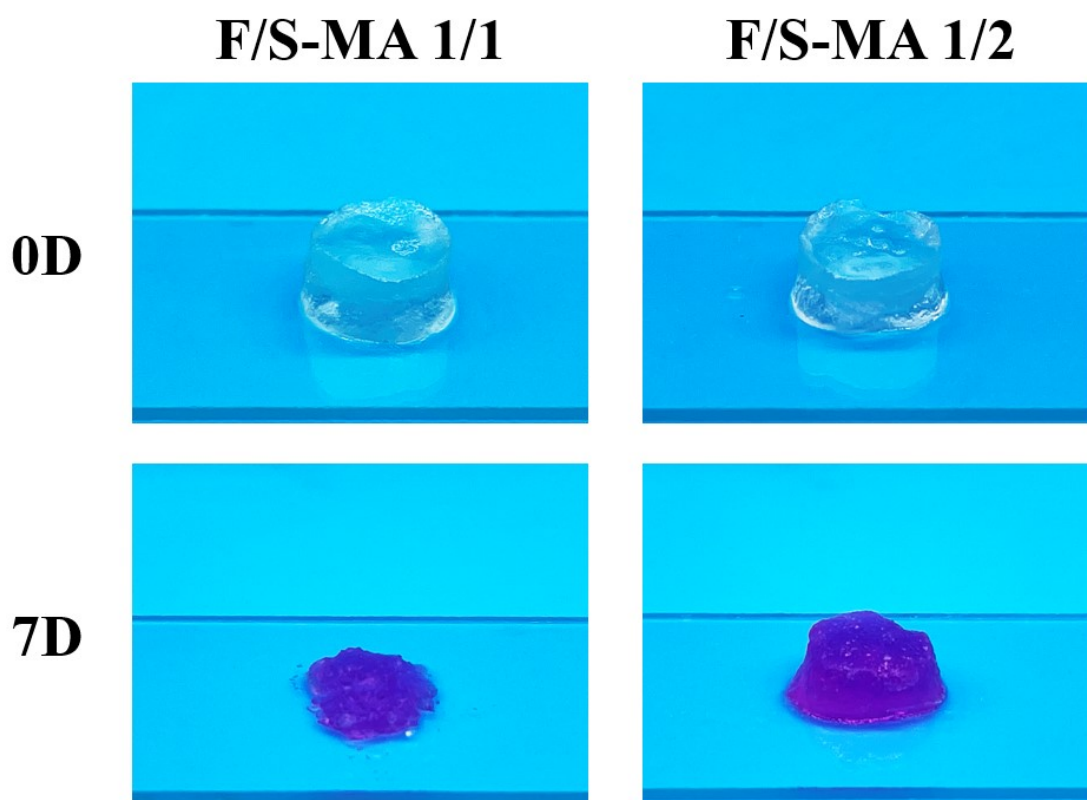


Figure S5. Macroscopic images of F/S-MA 1/1 and F/S-MA 1/2 after 1 and 7 days of degradation.

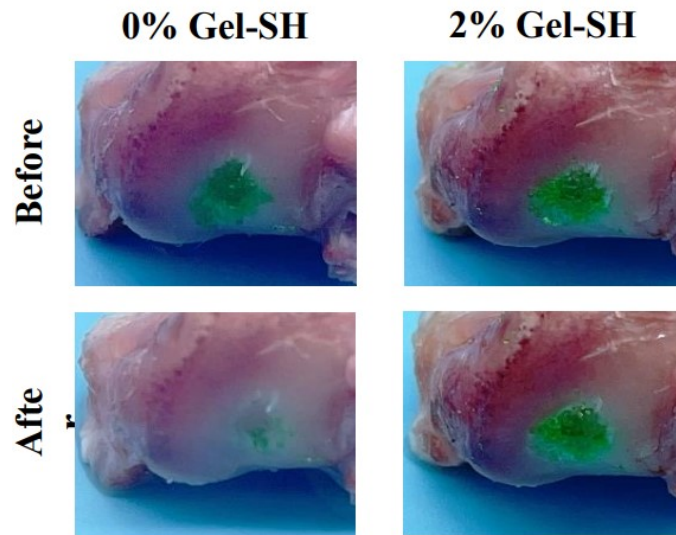


Figure S6. Adhesion of microgel assemblies, adhesion before and after PBS flushing.

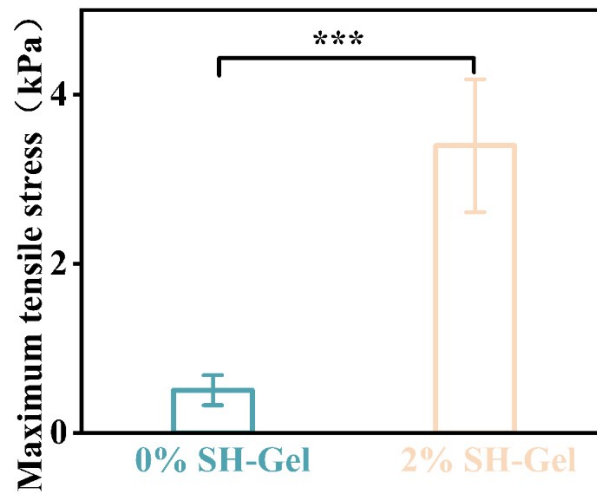


Figure S7. Maximum tensile stress of microgel assemblies. (Without and with assembly agent.)



Figure S8 Surgical procedures for the treatment of articular cartilage injuries

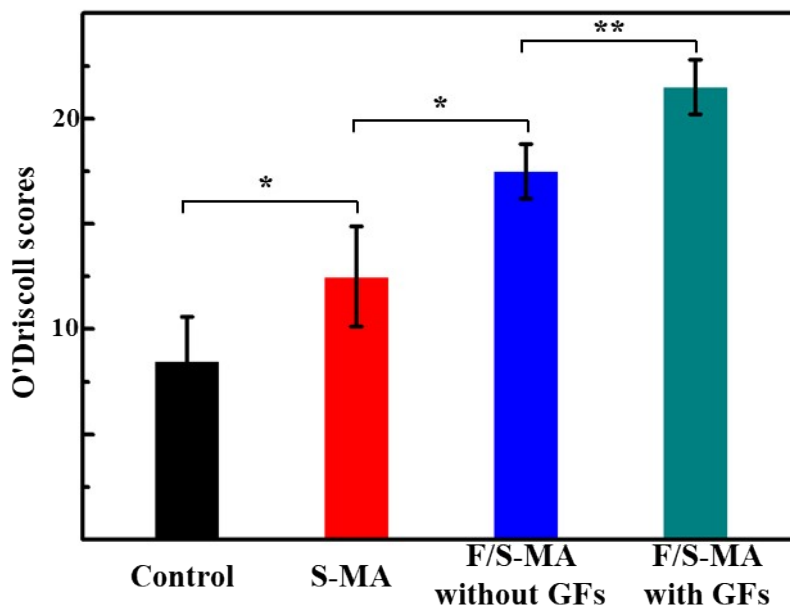


Figure S9 O'Driscoll scores of Control (microfracture), S-MA, F/S-MA without GFs and F/S-MA with GFs.

Table S1 Lists of primers using in RT-PCR

Target gene	Sequence (5'-3')
ACAN	F: AGTGGATCGGTCTGAATGACAGG
	R: AGAAGTTGTCAGGCTGGTTTGA
Sox9	F: AGCACAAGAAAGACCACCCC
	R: ATGTGAGTCTGTTCCGTGGC
Col 2	F: AGGGCAACAGCAGGTTACATAC
	R: TGTCCACACCAAATTCCTGTTCA
Col 1	F: ATGCCGCGACCTCAAGATG
	R: TGAGGCACAGACGGCTGAGTA
Gapdh	F: GTCGGTGTGAACGGATTTGG
	R: CTGGAAGATGGTGATGGGCT

Table S2 Modified cartilage repair score system

		category	score
Nature of predominant tissue	Cellular morphology	Hyaline articular cartilage	4
		Incompletely differentiated mesenchyme	2
		Fibrous tissue or bone	0
	Safranin O staining of the matrix	Normal or nearly normal	3
		Moderate	2
		Slight	1

		None	0
	Collagen	normal or nearly normal	3
	Hstaining of the matrix	Moderate	2
		Slight	1
		None	0
Structural characteristics	Surface regularity	Smooth and intact	3
		Superficial horizontal lamination	2
		Fissures: 25–100% of the thickness	1
		Severe disruption, including fibrillation	0
	Structural integrity	Normal	2
		Slight disruption, including cysts	1
		Severe disintegration	0
	Thickness	100% of normal adjacent cartilage	2
		50–100% of normal cartilage	1
		0–50% of normal cartilage	0
Bonding to the adjacent cartilage	Bonded at both ends of graft	2	
	Bonded at one end, or partially at both ends	1	
	Not bonded	0	
Freedom from cellular changes of degeneration	Hypocellularity	Normal cellularity	3
		Slight hypocellularity	2
		Moderate hypocellularity	1
		Severe hypocellularity	0
	Chondrocyte clustering	No clusters	2
		< 25% of the cells	1
		25–100% of the cells	0
	Freedom from degenerative changes in adjacent cartilage	Normal cellularity, no clusters, normal staining	3
		Normal cellularity, mild clusters, moderate staining	2
		Mild or moderate hypocellularity, slight staining	1
Severe hypocellularity, poor or nostaining		0	
total score			27