

**Supplementary Information for**

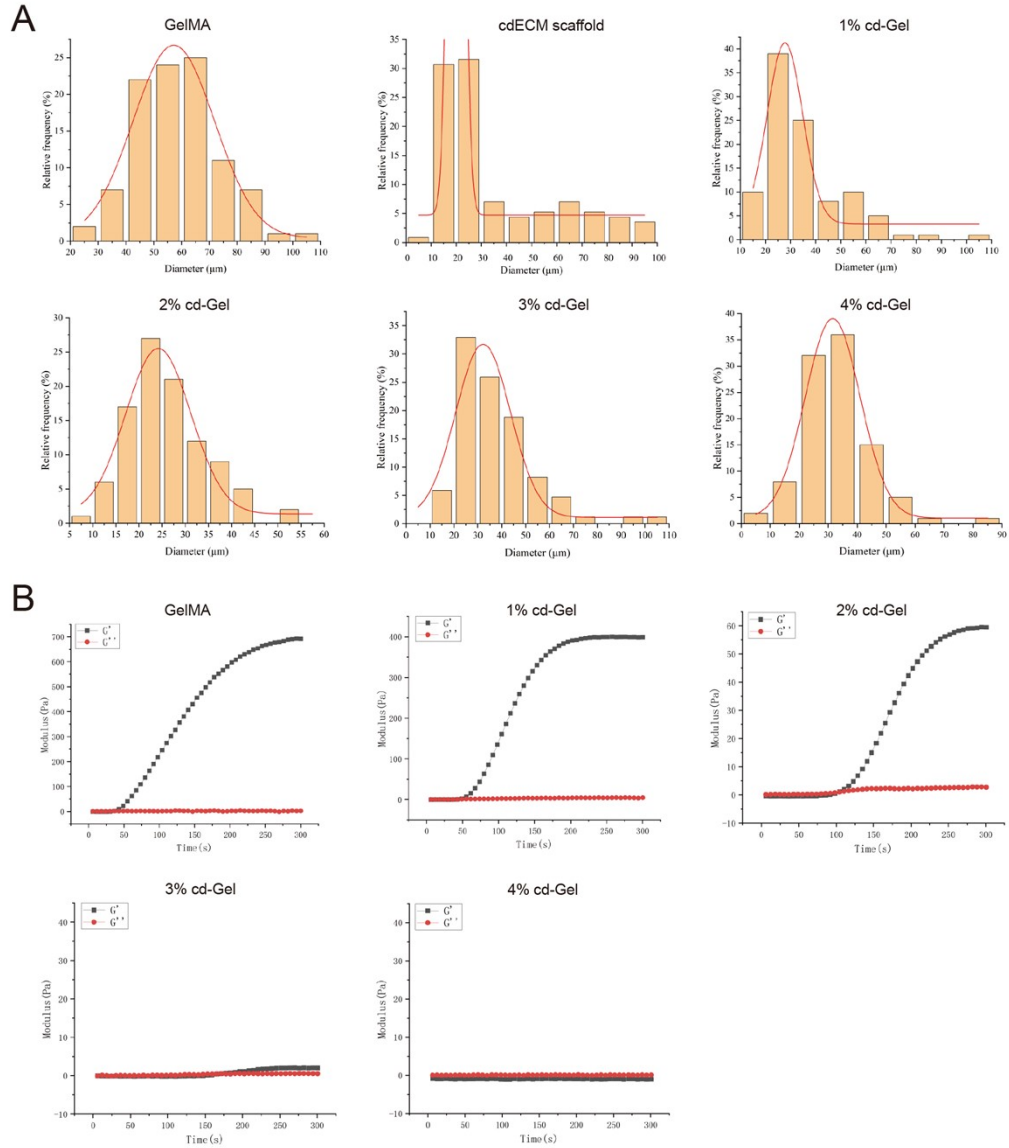
**The Multimodal Effects of Extracellular Matrix on Cellular  
Morphology, Dynamics and Functionality**

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Gen Wen

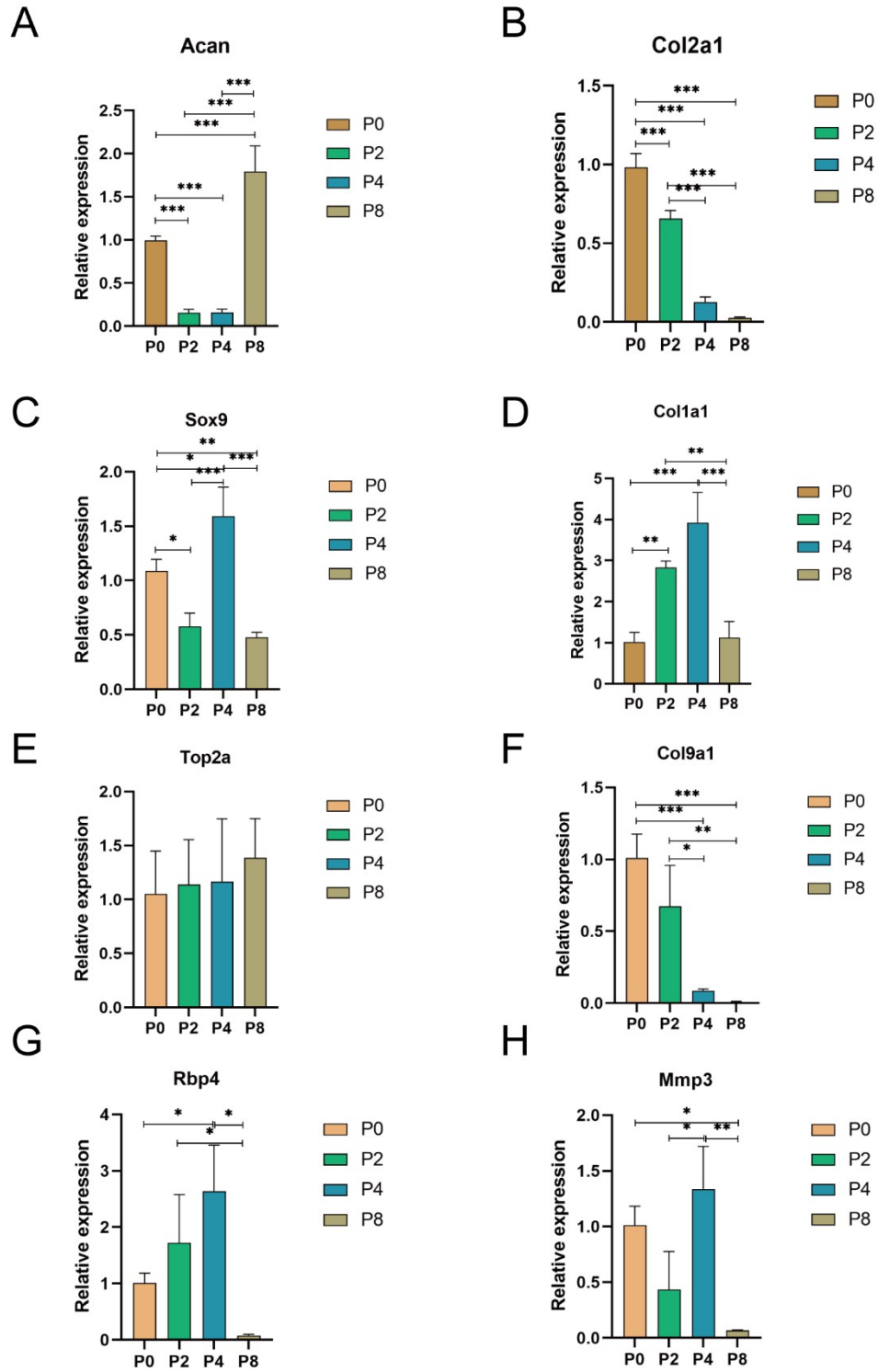
**Supplementary files**

Figs. 1-4

Table S1-S2

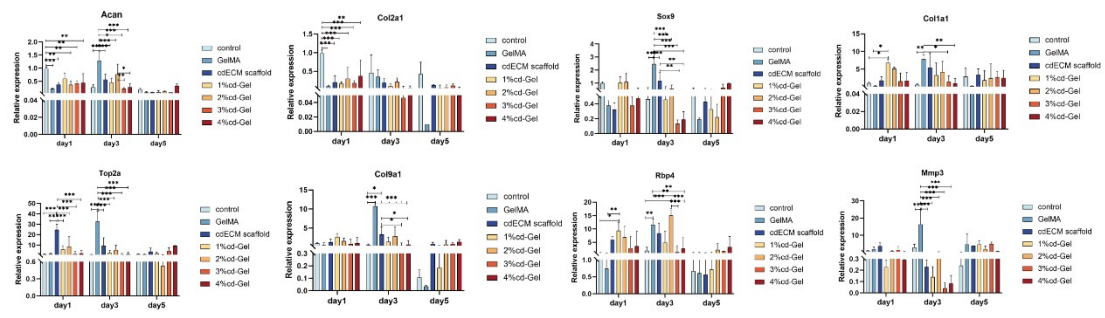


**Figs. 1. Characterization of GelMA hydrogel, cd-Gel hybrid and cdECM scaffold. (A)** Distribution of pore size in GelMA hydrogel, cd-Gel hybrid and cdECM scaffold. **(B)** Rheological properties of GelMA hydrogel and cd-Gel hybrid.

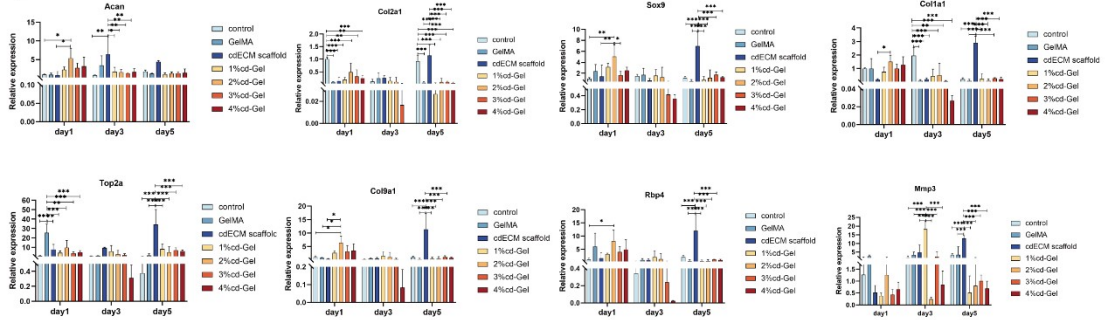


**Figs. 2. QPCR analysis of chondrocyte phenotype related genes in GelMA hydrogel, cd-Gel hybrid hydrogel and cdECM scaffold. \* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .**

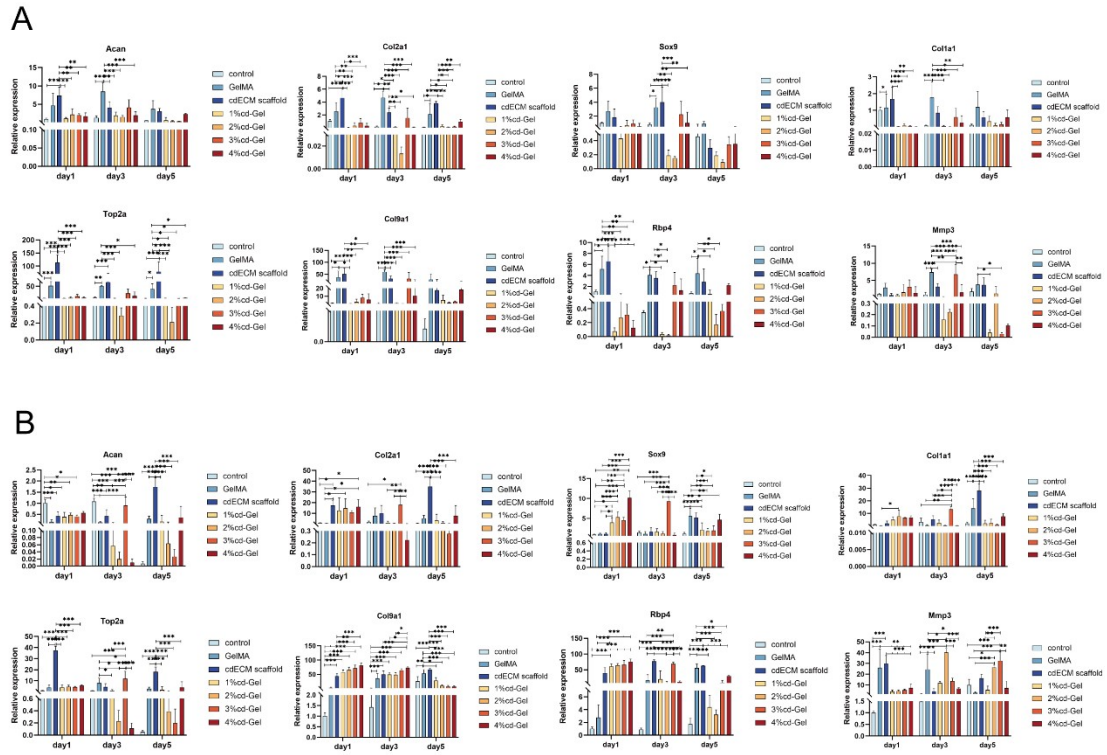
**A**



**B**



**Figs. 3. QPCR analysis of chondrocyte phenotype related genes in GelMA hydrogel, cd-Gel hybrid hydrogel and cdECM scaffold at different times. (A) Analysis of P0 chondrocytes at day 1, 3, 5. (B) Analysis of P2 chondrocytes at day 1, 3, 5. \* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .**



**Figs. 4. QPCR analysis of chondrocyte phenotype related genes in GelMA hydrogel, cd-Gel hybrid hydrogel and cdECM scaffold at different times. (A) Analysis of P4 chondrocytes at day 1, 3, 5. (B) Analysis of P8 chondrocytes at day 1, 3, 5. \* $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\* $p < 0.001$ .**

Table S1. List of sequence of primers applied in RT-PCR experiments

Genes	Sequence of primer
GAPDH	F 5'-AAACCCATCACCATCTTCCAG-3' R 5'-CTCCACGACATACTCAGCACC-3'
COL2A1	F 5'-GGTGTCAAGGGTCACAGAGG-3' R 5'-TTGGGGCCTTGTTACCTTT-3'
SOX9	F 5'-ACTGTATGTGGATGTGTGCGT-3' R 5'-AAG GTCTGTCCGATGTCTCTC-3'
ACAN	F 5'-ATGAGTGGCAGTGGAGATTC-3' R 5'-AGA CCCTAACCCCTTCTTTC-3'
COL1A1	F 5'-TAGGAGTCGAGGGACCCAAG-3' R 5'-AGGCTCTCCCTTAGGACCAG-3'
TOP2a	F 5'-GGTGAAAGCGAAGGGGAAGA-3' R 5'-GAGAAGCTGGCACACTGTCT-3'
COL9A1	F 5'-CGACCCTGGGAAAAGAGGAC-3' R 5'-GGGATTCCGTCTCGACCATC-3'
Rbp4	F 5'-GGTGAGCAGCTTCAGAGTCA-3' R 5'-TGAGGGTCTGCTTTGACAGT-3'
MMP3	F 5'-ATCCCTTTTGATGGGCCTGG-3' R 5'-GGATGGAAGAGACGGCCAAA-3'

Table S2. Flow cytometry data of ROS level

Group	Tube	Positive ratio
control	Tube 1	97.72%
	Tube 2	99.59%
	Tube 3	99.77%
GelMA	Tube 4	99.88%
	Tube 5	99.92%
	Tube 6	99.78%
cdECM-scaffold	Tube 8	44.84%
	Tube 9	32.28%
	Tube 10	48.32%
1% cd-Gel	Tube 11	22.35%
	Tube 12	21.19%
	Tube 13	10.94%
2% cd-Gel	Tube 14	22.01%
	Tube 15	10.77%
	Tube 16	9.8%
3% cd-Gel	Tube 17	12.38%
	Tube 18	12.56%
	Tube 19	17.37%
4% cd-Gel	Tube 20	11.19%
	Tube 21	13.24%
	Tube 22	28.89%