

Supplementary Figures

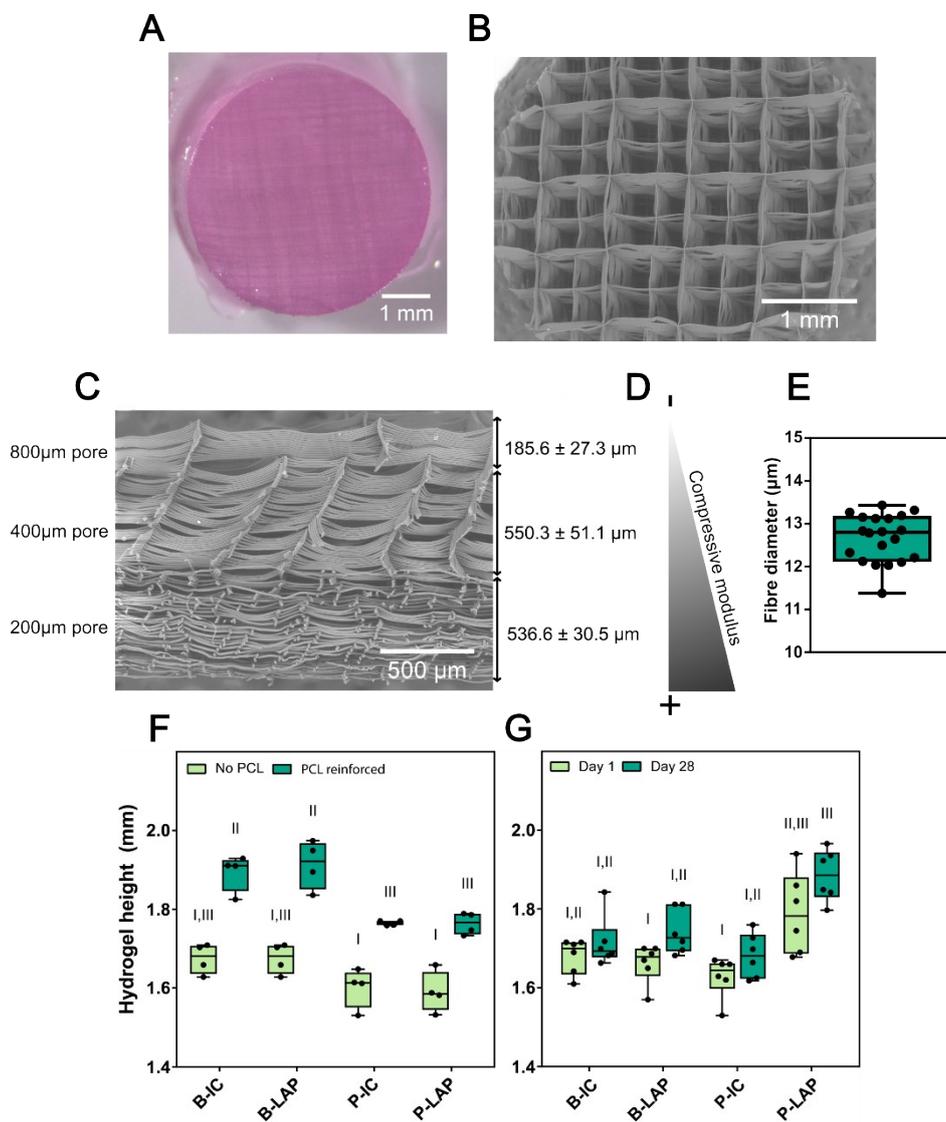


Figure S1. (A) Chondrocyte-laden GelMA-HAMA hydrogel reinforced with multiphasic mPCL scaffold at day 1 of cell culture. (B) Top view SEM image of an mPCL scaffold. (C) Cross-sectional SEM image of mPCL scaffold showing distinct pore size zones. (D) mPCL scaffold stiffness is depth-dependent, with compressive modulus increasing as pore size decreases. (E) mPCL fibres were $12.66 \pm 0.55 \mu\text{m}$ in diameter. (F) Hydrogel heights of cell-free GelMA-HAMA hydrogels with or without mPCL fibre reinforcement ($n = 4$). (G) Hydrogel heights of GelMA-HAMA-mPCL hydrogels encapsulated with human articular chondrocytes at day 1 and day 28 of cell culture ($n = 6$). Groups that do not share a common Roman numeral are statistically different ($p < 0.05$).

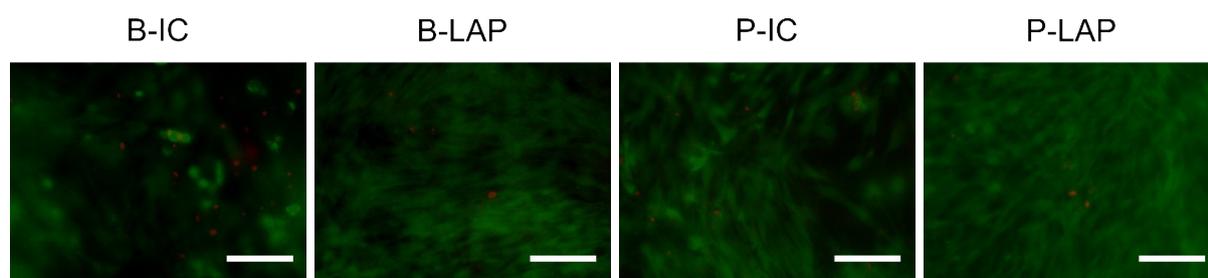


Figure S2. Representative live/dead images of human articular chondrocytes in GelMA–HAMA–mPCL hydrogel constructs at the hydrogel surface. Images are taken from a single layer of a full-thickness z-stack image. Hydrogel constructs were fabricated with either bovine-derived (B) or porcine-derived (P) GelMA, crosslinked with IC2959 and 365 nm light (IC) or LAP and 405 nm light (LAP). Living cells appear green, dead cells appear red. Scale bars: 100 μ m.

No PCL reinforcement

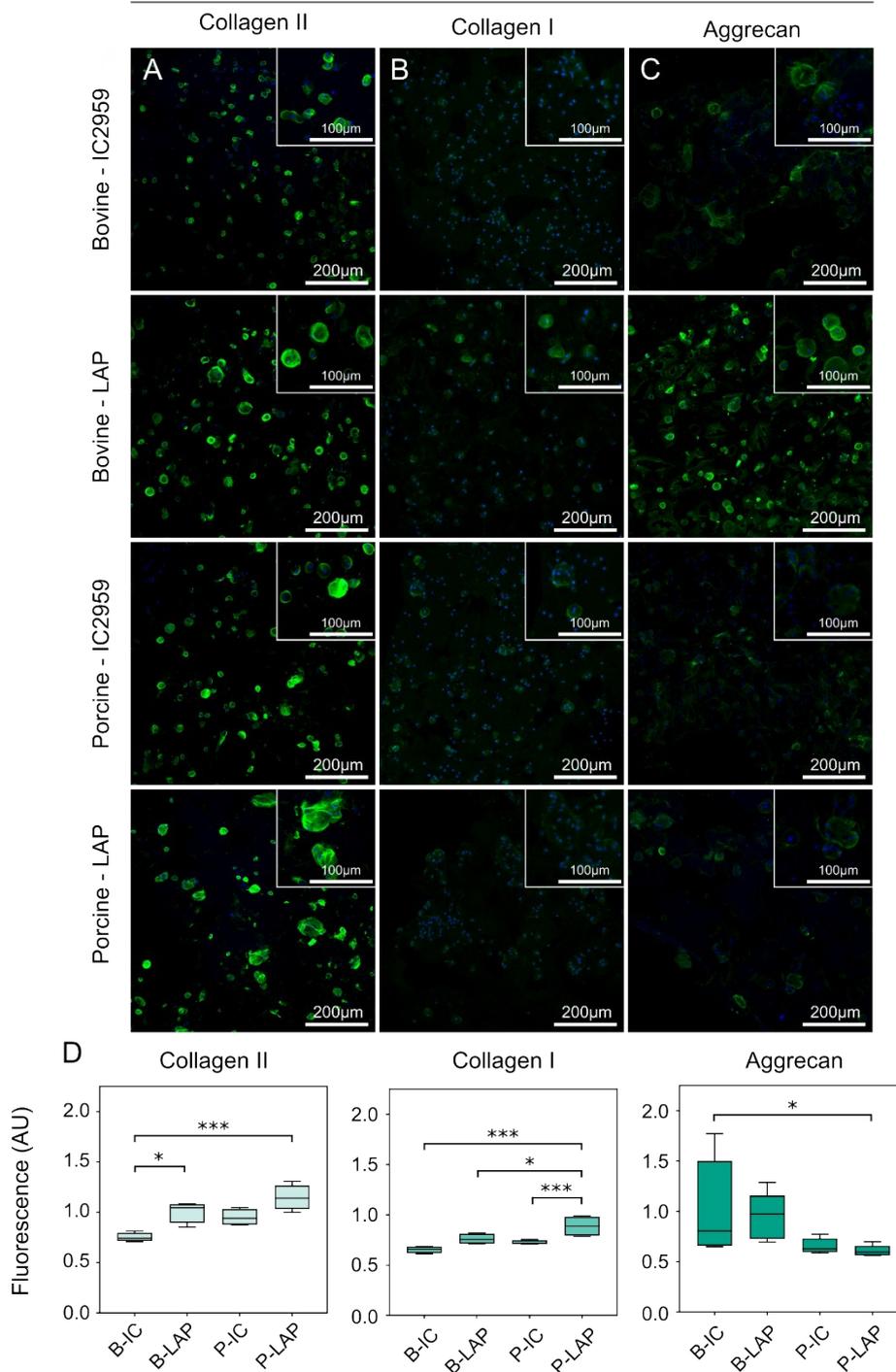


Figure S3. ECM accumulation in non-reinforced GelMA-HAMA hydrogel constructs after 28 days of cell culture. (A-C) Representative confocal images of human articular chondrocytes encapsulated in bovine-derived (B) or porcine-derived (P) GelMA, crosslinked with IC2959 and 365 nm light (IC) or LAP and 405 nm light (LAP). Immunoreactive regions for (A) collagen type II, (B) collagen type I and (C) aggrecan appear green. Cell nuclei are counterstained with DAPI (blue). (D) Integrated intensities for collagen II, collagen I and aggrecan. Asterisks indicate statistical difference between groups ($*p < 0.05$, $***p < 0.001$) (AU: arbitrary units). $n = 3$ (3 donors, 1 construct per donor).

Table S1. Forward (F) and reverse (R) primer sequences used for RT-PCR.

Gene	GenBank Number	Forward (5'–3')	Reverse (3'–5')	Product size (base pair)
<i>RPL13A</i>	NM_012423	CATAGGAAGCTGGGAGCAAG	GCCCTCCAATCAGTCTTCTG	157
<i>TBP</i>	NM_003194.4	GAGCCAAGAGTGAAGAACAGTC	CATCACAGCTCCCCACCATATT	123
<i>MMP2</i>	NM_004530.4	CCGTCGCCCATCATCAA	AGATATTGCACTGCCAACTCT	71
<i>MMP13</i>	NM_002427.3	ACTTCACGATGGCATTGCTG	CATAATTTGGCCCAGGAGGA	122
<i>ACAN</i>	NM_001135	GCCTGCGCTCCAATGACT	TAATGGAACACGATGCCTTCA	106
<i>COL1A2</i>	NM_000089.3	GGCCCTCAAGGTTTCCAAGG	CACCCTGTGGTCCAACAATC	166
<i>COL2A1</i>	NM_001844	GGCAATAGCAGGTTACGTACA	CGATAACAGTCTTGCCCACTT	79
<i>COL10A1</i>	NM_000493	ACCCAACACCAAGACACAGTTCT	TCTTACTGCTATACCTTTACTCTTTATGG	64
<i>PRG4</i>	NM_005807	GAGTACCCAATCAAGGCATTATCA	TCCATCTACTGGCTTACCATTGC	80