

# Supporting Information

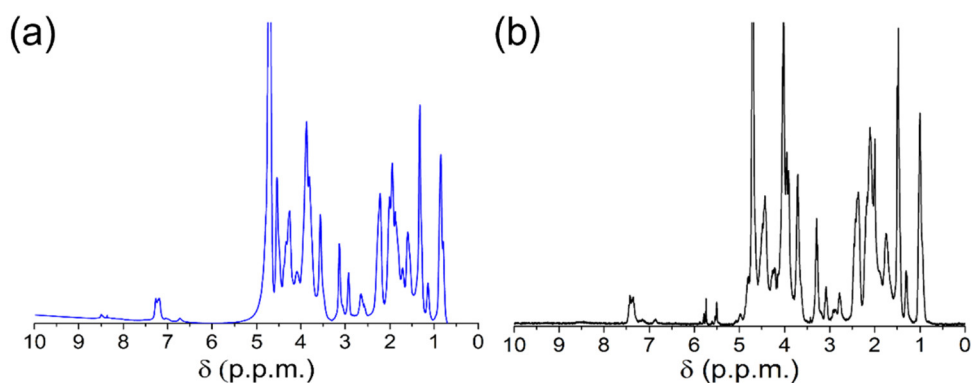
## Cell-Laden 3D Printed GelMA/Hap and THA Hydrogel Bioinks: Development of Osteochondral Tissue Like

**Table S1.** Primer and probe sequences for qRT- PCR.

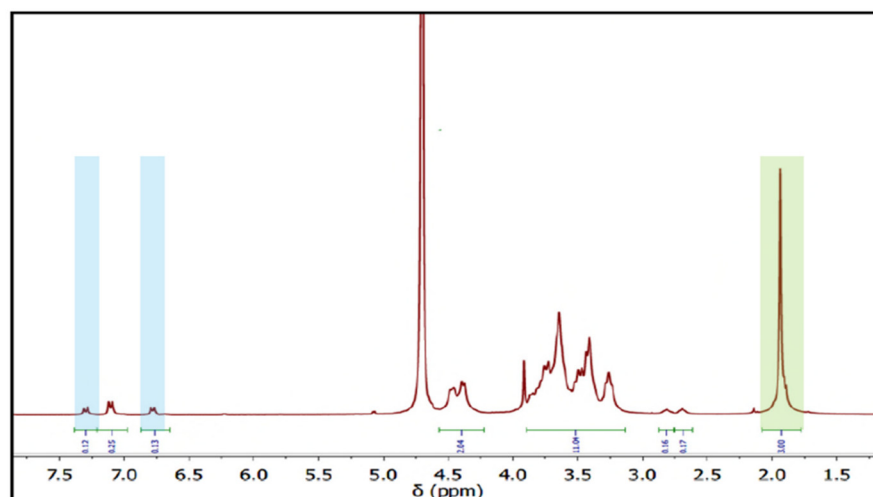
Gene	Forward primer	Reverse primer	Probe
<i>Coll 2</i>	5' – GGC AAT AGC AGG TTC ACG TAC A -3'	5'- GAT AAC AGT CTT GCC CCA CTT ACC -3'	5'- CCT GAA GGA TGG CTG CAC GAA ACA TAC -3'
<i>Coll 10</i>	5'- ACG CTG AAC GAT ACC AAA TG -3'	5'- TGC TAT ACC TTT ACT CTT TAT GGT GTA -3'	5'- ACT ACC CAA CAC CAA GAC ACA GTT CTT CAT TCC -3'
<i>Coll 1</i>	5'- CCC TGG AAA GAA TGG AGA TGA T -3'	5'- ACT GAA ACC TCT GTG TCC CTT CA -3'	5'- CGG GCA ATC CTC GAG CAC CCT -3'
<i>ACAN</i>	5'- AGT CCT CAA GCC TCC TGT ACT CA -3'	5'- CGG GAA GTG GCG GTA ACA -3'	5'- CCG GAA TGG AAA CGT GAA TCA GAA TCA ACT -3'
<i>Sox 9</i>	5'- TCT GGA GAC TTC TGA ACG AGA G - 3'	5'- CTG GTA CTT GTA ATC CGG GTG -3'	5'- TCC ACG AAG GGC CGC TTC T -3'
<i>IBSP</i>	5'- GGC CTG TGC TTT CTC AAT G -3'	5'- CGT GGC CTG TAC TTA AAG ACC CCA TT-3'	5'- ACT GCC CTG AAC TGG AAA TC-3'
<i>Runx2</i>	5'- AGC AAG GTT CAA CGA TCT GAG AT -3'	5'- TTT GTG AAG ACG CTT ATG GTC AA -3'	5'-TGA AAC TCT TGC CTC GTC CAC TCC G-3'
<i>RPLP0</i>	5'- TGG GCA AGA ACA CCA TGA TG-3'	5'- CGG ATA TGA GGC AGC AGT TTC-3'	5'- AGG GCA CCT GGA AAA CAA CCC AGC -3'

**Table S2.** List of assays on demand used for qRT-PCR.

Gene	Assay ID
Human ALPL	Hs01029144_m1



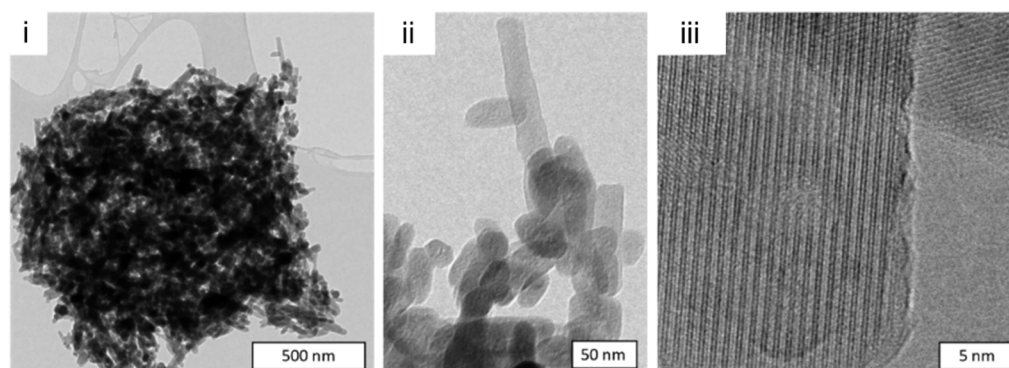
**Figure S1.** H-NMR spectra of a) Gelatin and b) GelMA.



**Figure S2.** H-NMR spectrum of THA. The peak around 1.9 ppm, marked in green, represents 3 protons, and the peaks around 6.8 and 7.3 ppm are marked in blue. Each represents two protons caused by tyramine functionalization of HA (280 kDa).

**Table S3.** The concentration of chemical elements in nHA besides Ca and P.

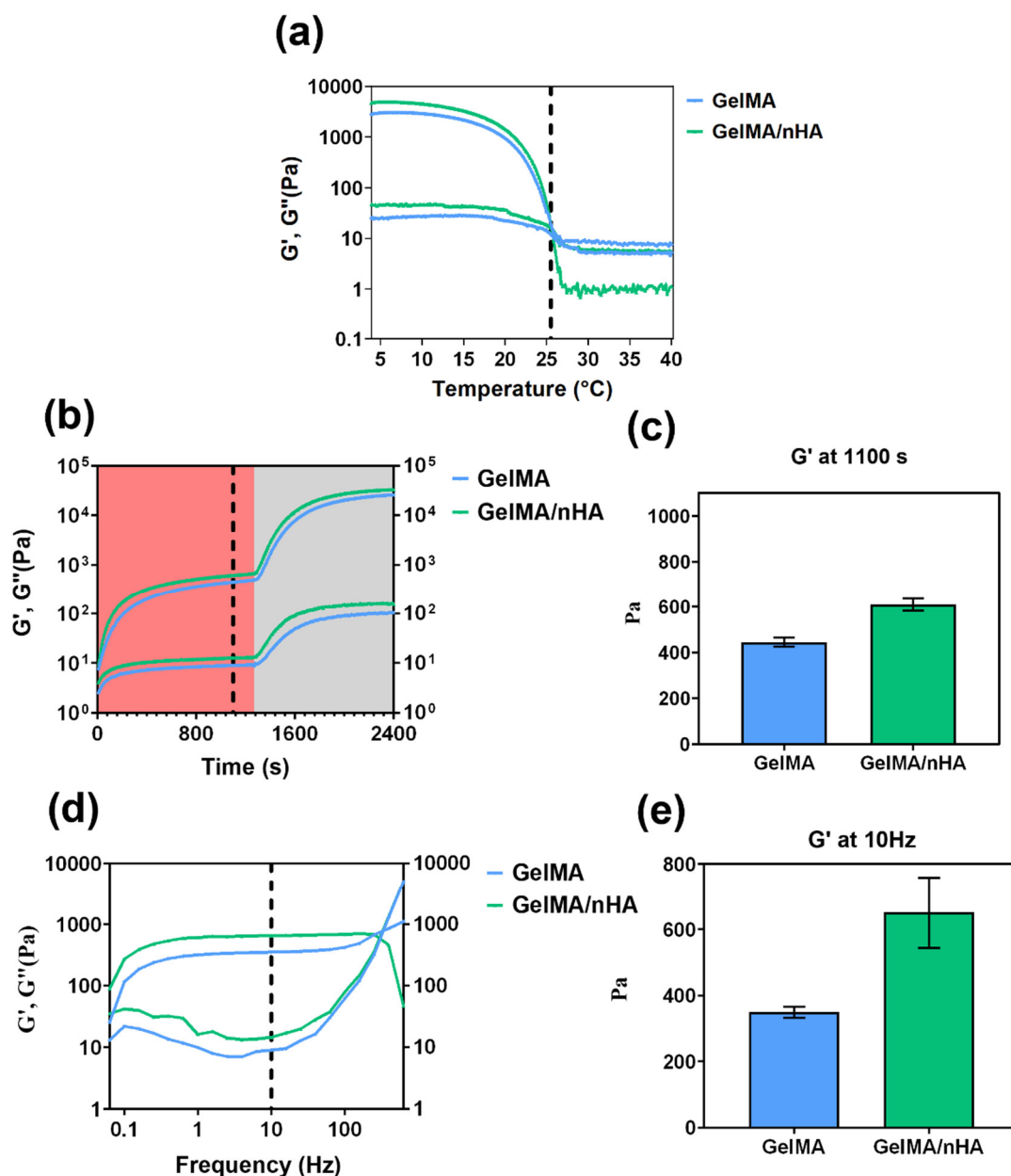
Element	Concentration
Mg	$0.038 \pm 0.004$ g/kg
Sr	$124 \pm 12$ mg/kg
Zn	$3.55 \pm 0.36$ mg/kg
K	$< 0.02$ g/kg
Na	$< 0.02$ g/kg



**Figure S3.** TEM images of spray-dried nHA: (i) view of one spray-dried nHA sphere, (ii) close-up of nHA rounded particles, (iii) high-resolution TEM image of nHA crystallographic planes.

**Table S4.** Characteristics of nHA synthesized by wet precipitation technology.

Ca/P molar ratio	1.67 (stoichiometric <u>nHA</u> )
Specific surface area	$83 \pm 8$ m <sup>2</sup> /g
Particle shape	Needle like
Length x width of <u>nHA</u> particles	$81 \pm 38 \times 25 \pm 4$ nm
Size of the spray-dried <u>nHA</u> spheres	$4 \pm 2$ <u>μm</u>



**Figure S4.** Rheological Properties of the GelMA-based hydrogel. a) Variation in dynamic storage modulus  $G'$  and loss modulus  $G''$  as a function of temperature in a temperature sweep test of GelMA and GelMA/nHA 1% hydrogels, where the cross-over points between the gel and sol state ( $G' = G''$ ) represent the gel-sol transition temperature marked by a vertical dashed line at 25  $^{\circ}\text{C}$ . All measurements were done in triplicate ( $n=3$ ); b) time sweep measurements, where the red shaded region indicates was taken at 20  $^{\circ}\text{C}$ , and the grey shaded region indicates the time when UV light was turned on to allow effective crosslinking of GelMA in the presence of Irgacure 2595 and c) storage modulus ( $G'$ ) value extracted at a time point of 1100 s. Here average of  $n=3 \pm \text{SD}$  is shown; d) frequency sweep and e) storage modulus ( $G'$ ) value extracted at 10 Hz visualized in columns for easier identification of differences. Here average of  $n=3 \pm \text{SD}$  is shown.