

Supporting Information

Mineralized collagen scaffolds induce hMSC osteogenesis and matrix remodeling

Daniel W. Weisgerber, Steven R. Caliri, Brendan A.C. Harley

Name	Forward	Reverse	Source
<i>COL1A1</i>	CAG CCG CTT CAC CTA CAG C	TTT TGT ATT CAA TCA CTG TCT TGC C	62
<i>OPN</i>	GCG AGG AGT TGA ATG GTG	CTT GTG GCT GTG GGT TTC	62
<i>RUNX2</i>	GGTTAATCTCCGCAGGTCCTACT	CACTGTGCTGAAGAGGCTGTT	63
<i>BSP</i>	TGCCTTGAGCCTGCTTCC	GCAAAATTAAGCAGTCTTCATTTTG	64
<i>GAPDH</i>	CCATGAGAAGTATGACAACAGCC	CCTTCCACGATACCAAAGTTG	65

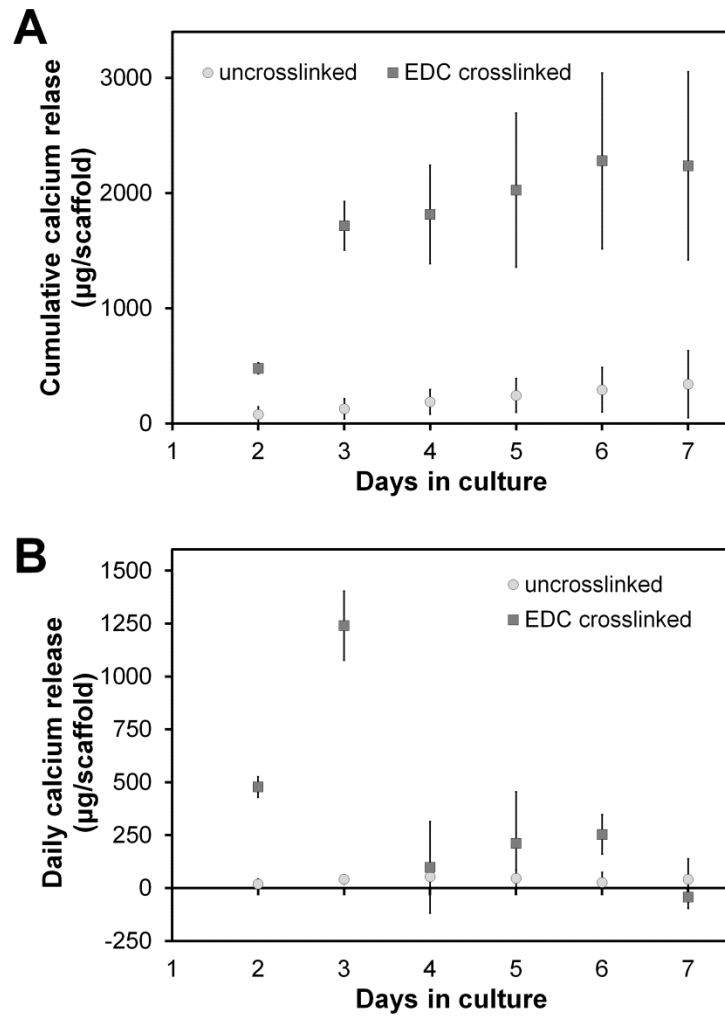
Supplementary Table 1. Primer sequences used for PCR.

Sample	Day 14		Day 28		Day 56	
	Moduli, kPa	Est. Dens.	Moduli, kPa	Est. Dens.	Moduli, kPa	Est. Dens.
CG (unseeded)	1.83 ± 0.48	---	1.71 ± 0.43	1.00	1.24 ± 0.21	1.00
CG Growth	1.57 ± 0.43	0.93	1.11 ± 0.30*	0.81	1.51 ± 0.13	1.10
CGCaP (unseeded)	23.00 ± 0.59	---	19.8 ± 1.4	1.00	23.4 ± 3.3	1.00
CGCaP Growth	34.7 ± 4.4	1.23	37.7 ± 3.3	1.38	58.7 ± 3.7	1.58
CGCaP BMP2	33.7 ± 2.7	1.21	45.0 ± 7.7	1.51	62.7 ± 7.3	1.63
CGCaP Osteo	44.1 ± 5.6	1.39	48 ± 11	1.56	76.9 ± 9.2	1.81

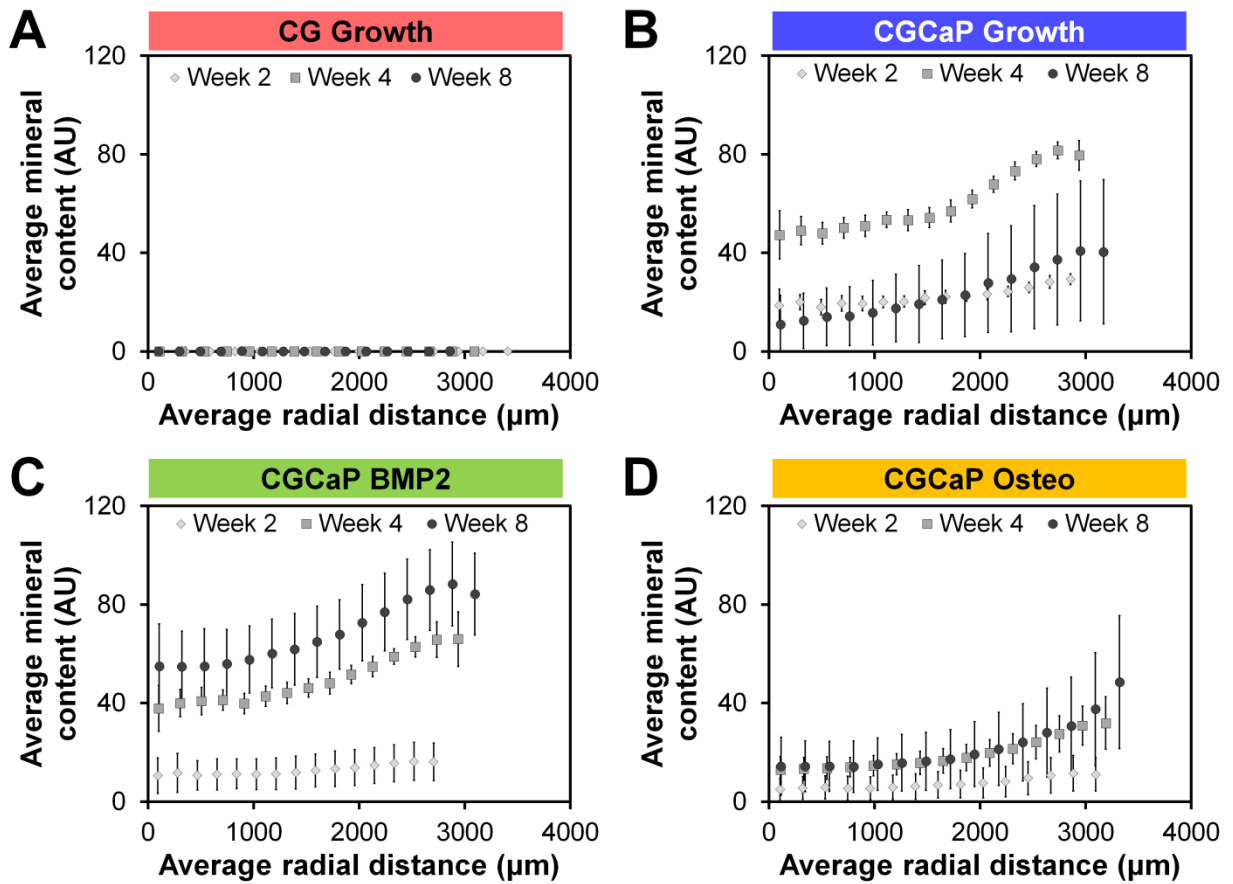
Supplementary Table 2. Elastic moduli of hMSC-seeded non-mineralized and mineralized collagen scaffolds as a function of culture time and media supplementation (n=3, *: n=2). The estimated densification (Est. Dens.; $\rho_{cells} / \rho_{acellular}$) of the scaffold was calculated via established cellular solids theory methods from the difference in modulus of the hMSC-seeded vs. unseeded scaffold at each timepoint.

	Day 14	Day 28	Day 56
CGCaP Growth	130 ± 13	136 ± 10	143 ± 10
CGCaP BMP2	131 ± 16	134 ± 10	142 ± 10
CGCaP Osteo	133 ± 5	132 ± 14	137 ± 10

Supplementary Table 3. Mean pixel intensity (A.U.) of Alizarin Red stained histology samples of hMSC-seeded mineralized collagen scaffolds.



Supplementary Figure 1. (A) Cumulative versus (B) daily release of calcium ions from non-crosslinked and EDC-crosslinked CGCaP scaffolds.



Supplementary Figure 2. Radial distribution pattern of mineral content for hMSC-seeded collagen scaffolds with culture time (2, 4, 8 weeks) as determined via micro-CT for (A) non-mineralized scaffold in growth media; or mineralized scaffold in (B) growth media, (C) BMP2 supplemented media, or (D) osteogenic media.