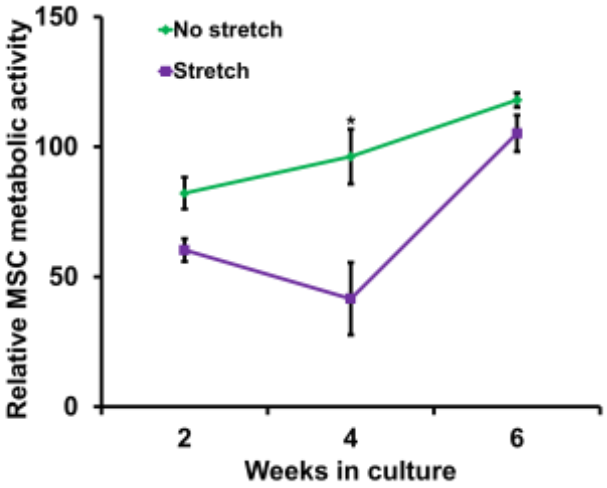
Scaffold section	Mean pore size ± SEM (μm)
CG bottom (longitudinal)	143.1 ± 20.7
CG bottom (transverse)	160.9 ± 23.6
CG middle (longitudinal)	221.0 ± 13.9*
CG middle (transverse)	215.7 ± 23.4
CGCaP top (longitudinal)	189.1 ± 21.3
CGCaP top (transverse)	186.5 ± 9.1

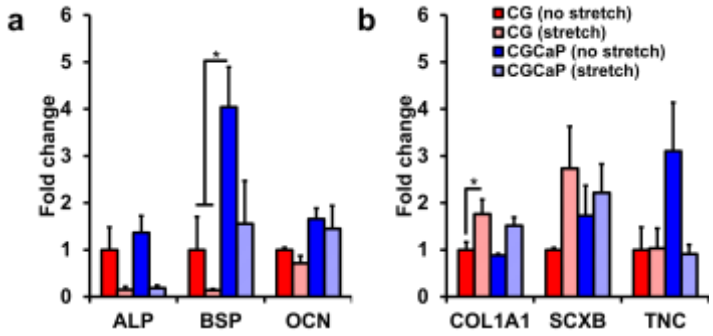
Supplemental Table 1. Multi-compartment TBJ scaffold pore size. Mean pore sizes in the longitudinal and transverse planes of the CG-CGCaP scaffold.*: significantly greater than CG bottom (longitudinal) section.

Transcript	Sequence	Reference
ALP	Forward: 5'-AGCACTCCCACTTCATCTGGAA-3' Reverse: 5'-GAGACCCAATAGGTAGTCCACATTG-3'	[12]
BSP	Forward: 5'-TGCCTTGAGCCTGCTTCC-3' Reverse: 5'-GCAAAATTAAAGCAGTCTTCATTTTG-3'	[11]
COL1A1	Forward: 5'-CAGCCGCTTCACCTACAGC-3' Reverse: 5'-TTTTGTATTCAATCACTGTCTTGCC-3'	[12]
GAPDH	Forward: 5'-AGAAAAACCTGCCAAATATGATGAC-3' Reverse: 5'-TGGGTGTCGCTGTTGAAGTC-3'	[12]
OCN	Forward: 5'-CAGCGAGGTAGTGAAGAGA-3' Reverse: 5'-GAAAGCCGATGTGGTCAG-3'	[12]
SCXB	Purchased from Qiagen (sequence unavailable)	N/A
TNC	Forward: 5'-TTCACTGGAGCTGACTGTGG-3' Reverse: 5'-TAGGGCAGCTCATGTCACTG-3'	[13]

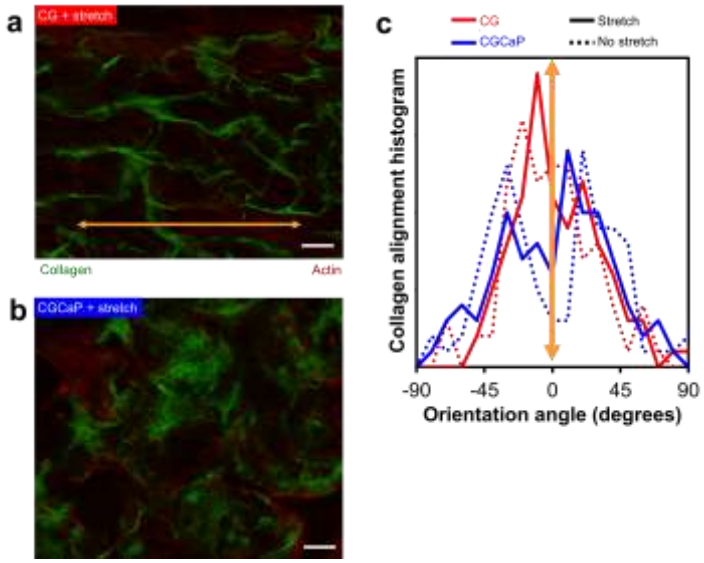
Supplemental Table 2. PCR primer sequences.



Supplemental Figure 1. MSC long-term viability in TBJ scaffolds. TBJ scaffolds maintained adequate and sustained MSC metabolic activity over the entire 6 week experiment. *: significantly greater than stretch group.



Supplemental Figure 2. Complete MSC gene expression from 6 week culture. (**a**) Expression of osteogenic genes alkaline phosphatase (*ALP*), bone sialoprotein (*BSP*), and osteocalcin (*OCN*) was elevated in the mineralized osseous compartment but generally decreased in response to stretch. (**b**) Expression of tenogenic markers type I collagen (*COL1A1*), scleraxis (*SCXB*), and tenascin-C (*TNC*) was elevated in the tendinous compartment in response to tensile stimulation with stretch also elevating tenogenic gene expression in the osseous compartment (with the exception of *TNC*).



Supplemental Figure 3. Second harmonic generation imaging of scaffold collagen organization. Collagen organization in response to stretch in the (**a**) tendinous and (**b**) osseous compartments. *Green channel*: collagen. *Red channel*: actin. *Scale bars*: 50 μm. (**c**) Quantification of collagen alignment in distinct compartments showed trend towards increased alignment and organization in the tendinous compartment.