Supporting Information

Contents

Figure S1. Degradation test of (a) SMP-CEC444 and (b) mechanical properties in tensile strength test of SMP-CEC444.

(a)

Recovery effect of SMP-CEC444

Recovery effect of SMP-CEC444

(b)

Ex vivo recovery effect of SMP-CEC444
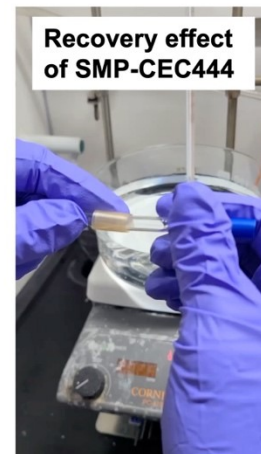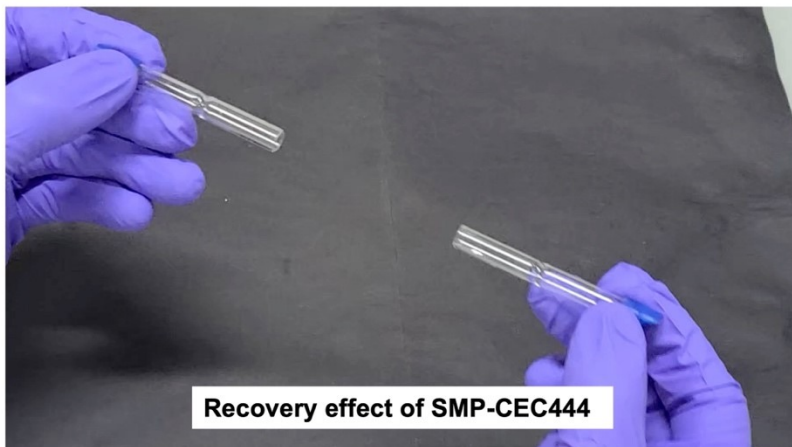
Figure S2. Shape-memory effect test videos. (a) *In vitro* simulation using a glass rod and (b) *ex vivo* simulation using the rat's hind limb.

PCL-F   **SMP-F**   **SMP-P-Par**   **SMP-P-Per**
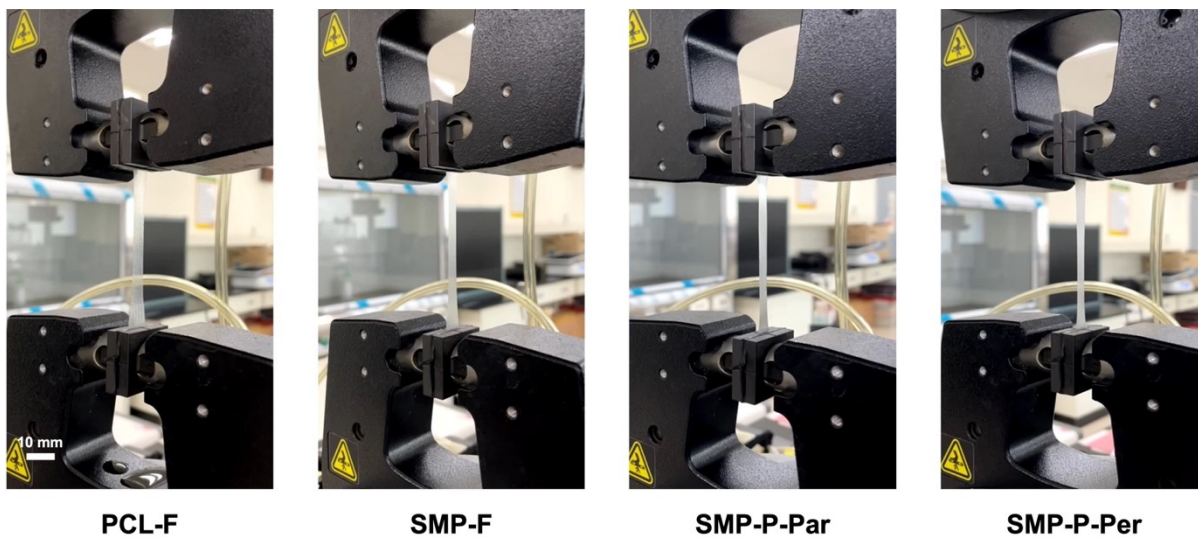
Figure S3. Tensile stress vs. tensile strain curve in each group with 10 loading rates tested at room temperature.

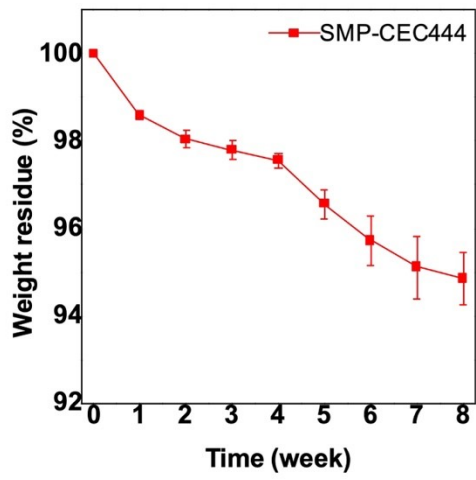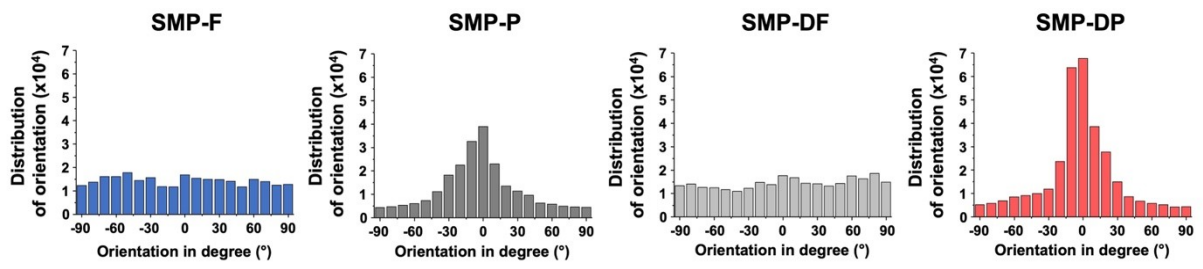**Figure S4.** Cell morphological quantitative analysis: distribution of orientation.
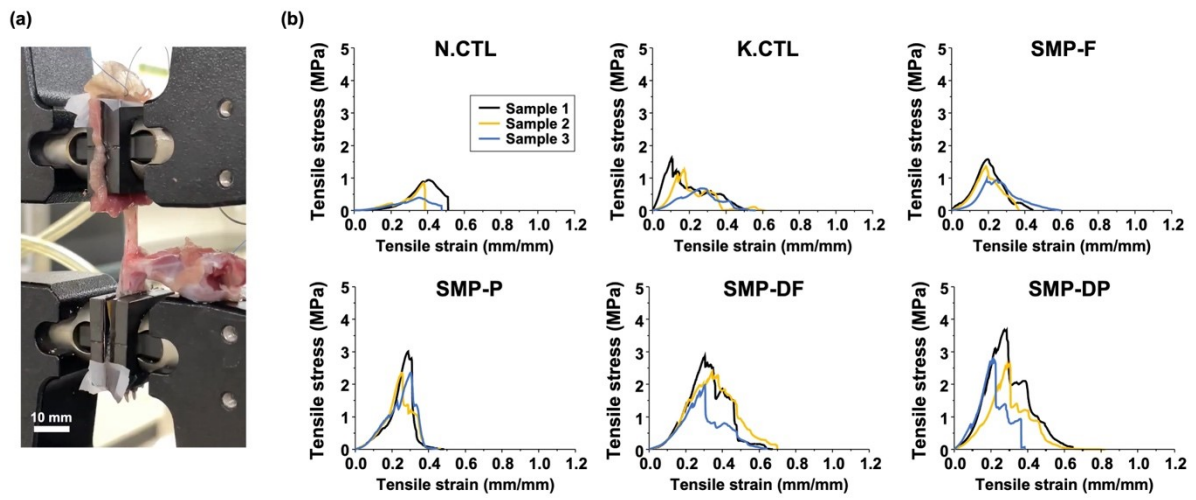
Figure S5. (a) Supplementary video file for biomechanical test. (b) Tensile stress vs. tensile strain curve in each group with 10 loading rates tested at room temperature. Biomechanical test of Achilles tendons retrieved after 8 weeks.

Figure S6. Quantification results of histological scoring. (*$P < 0.05$, **$P < 0.01$ compared to N.CTL; #$P < 0.05$ compared to K.CTL; and $$P < 0.05$ compared to SMP-F). NS: no significant difference.

Table S1. The residual mass of pure PCL and SMP-CEC444 showed a decrease at each time point.
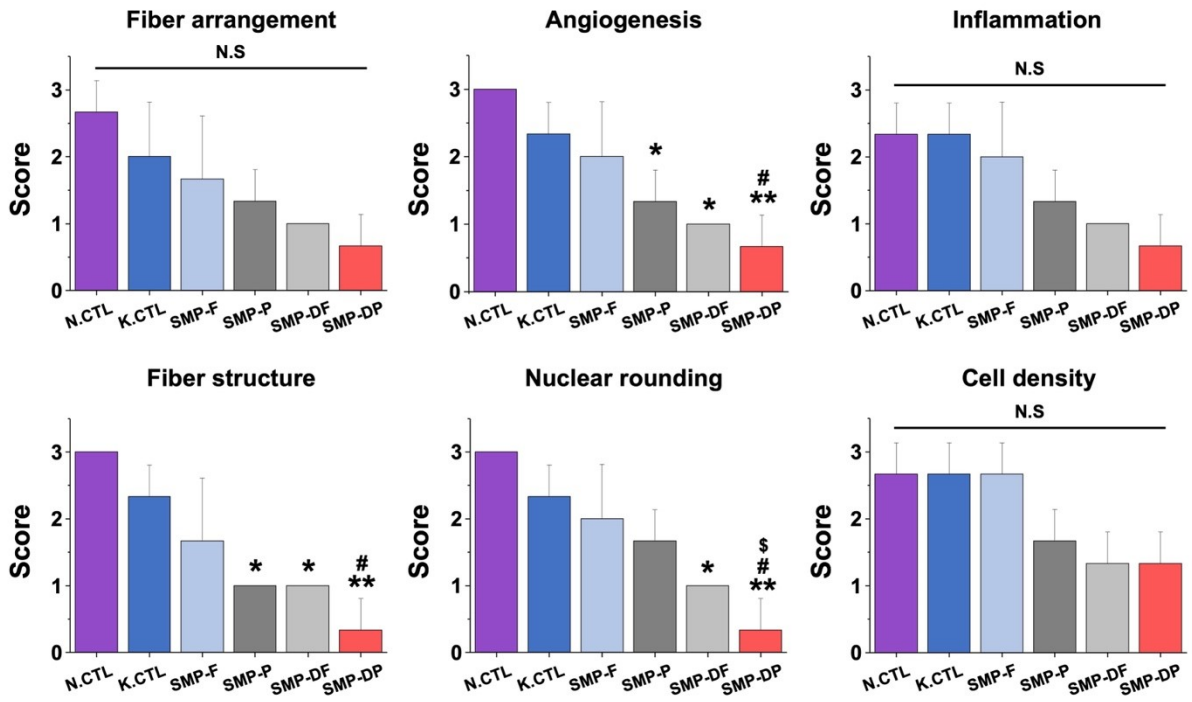
	Tensile Strength (%)	Tensile Strength STDEV (%)	Weight residue (%)	Weight residue_ STDEV (%)
0 week	100	6.12	100	0
1 week	82.86	8.36	99.30	0.02
2 weeks	79.77	6.34	98.86	0.20
3 weeks	75.62	3.41	98.27	0.23
4 weeks	69.90	5.92	97.71	0.17
5 weeks	69.80	3.45	96.56	0.33
6 weeks	68.02	5.05	95.72	0.58
7 weeks	67.33	6.54	95.12	0.72
8 weeks	62.96	6.16	94.85	0.60

Table S2. Histological scoring of Achilles tendons.

	Grade 0 (Native control)	Grade 1	Grade 2	Grade 3
		Histological scoring analysis		
Fiber arrangement	Compacted and parallel	Slightly loose and wavy	Moderately loose, wavy and cross to each other	No identifiable pattern
Fiber structure	Continue, long fiber	Slightly fragmented	Moderately fragmented	Severely fragmented
Angiogenesis (area infiltrated by neo-vascular)	< 10%	10 ~ 20%	20 ~ 30%	> 30%
Nuclear rounding	Long spindle shape cells	Slightly rounding	Moderately rounding	Severely rounding
Inflammation (area infiltrated by inflammation cells)	< 10%	10 ~ 20%	20 ~ 30%	> 30%
Cell density	Normal pattern	Slightly increase	Moderately increase	Severely increase