Supplementary data

Biomechanically, structurally and functionally meticulously tailored polycaprolactone/silk fibroin scaffold for meniscus regeneration

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Figure S1. Meniscus model. (A) Top observation, (B) Lateral observation.

Confocal Microscope Light Microscope

Figure S2. Confocal images of scaffold showed conjugation of FITC-L7 peptide.

Table S1. Gross Evaluation of Meniscal Implant Scorea

| Parameter        | PS-12W | PS-L7-12W | PS-24W | PS-L7-24W | P valueb | α   | β   |
|------------------|--------|-----------|--------|-----------|----------|-----|-----|
| Integration      | 1.3(1-2) | 2.1(1-3) | 1.7(1-2) | 2.3(2-3) | 0.001*   | 0.012* |
| Implant position | 1.6(1-2) | 2.0(1-3) | 1.7(1-2) | 2.2(2-3) | 0.047*   | 0.012* |
| Horn position    | 1.6(1-3) | 2.3(2-3) | 1.8(1-3) | 2.4(2-3) | 0.004*   | 0.021* |
| Shape            | 1.7(1-2) | 2.1(1-3) | 1.6(1-2) | 2.8(2-3) | 0.094    | 0.001* |
| Tears            | 2.3(2-3) | 2.6(2-3) | 2.4(2-3) | 2.8(2-3) | 0.101    | 0.008* |
| Surface          | 1.2(1-3) | 1.5(1-2) | 1.8(1-3) | 2.4(2-3) | 0.101    | 0.000* |
| Size             | 1.4(1-2) | 1.7(1-2) | 1.8(1-3) | 2.4(2-3) | 0.101    | 0.013* |
| Tissue strength  | 1.9(1-3) | 2.3(2-3) | 2.0(1-3) | 2.5(2-3) | 0.047*   | 0.004* |
| Synovia          | 2.1(1-3) | 2.4(2-3) | 2.1(1-3) | 2.5(2-3) | 0.060    | 0.047* |
| Total score      | 15.1(10-23) | 19.0(13-25) | 16.9(10-24) | 22.3(18-27) | 0.000*   | 0.000* |

*aEach parameter is scored from 1 to 3 based on the condition of the meniscal implant. Scores are provided as mean (range).

bα represents PS-12W vs PS-L7-12W; β represents PS-24W vs PS-L7-24W.

* represents statistically significant (*p < 0.05).
**Table S2.** Histological Features of Implants<sup>a</sup>

| Feature                  | PS-12W | PS-L7-12W | PS-24W | PS-L7-24W |
|--------------------------|--------|-----------|--------|-----------|
| Residual scaffold        | 5 (100)| 5 (100)   | 5 (100)| 5 (100)   |
| Foreign body reaction    | 5 (100)| 4 (80)    | 5 (100)| 3 (60)    |
| Hypocellular areas       | 5 (100)| 4 (80)    | 5 (100)| 3 (60)    |
| Blood vessels            | 5 (100)| 5 (100)   | 5 (100)| 5 (100)   |
| Fibrosis                 | 5 (100)| 4 (80)    | 3 (60) | 2 (40)    |
| Cartilage metaplasia     |        |           |        |           |
| Tip                      | 3 (60) | 4 (80)    | 4 (80) | 5 (100)   |
| Central                  | 2 (40) | 3 (60)    | 3 (60) | 5 (100)   |
| Integration              |        |           |        |           |
| Good                     | 3 (60) | 4 (80)    | 4 (80) | 5 (100)   |
| Poor                     | 2 (40) | 1 (20)    | 1 (20) | 0 (0)     |
| Inflammatory infiltrate  |        |           |        |           |
| Lymphocytes              | 5 (100)| 5 (100)   | 5 (100)| 4 (80)    |
| Plasma                   | 0      | 0         | 0      | 0         |
| Neutrophils              | 0      | 0         | 0      | 0         |

<sup>a</sup>The features were scored as being either present or absent for each implant (total of 5 implants for each group). Data are provided as n (%).

**Table S3.** Real-time PCR primers

| Gene          | Forward primer (5’–3’)                      | Reverse primer (5’–3’)                      |
|---------------|-----------------------------------------------|----------------------------------------------|
| Type I collagen | gCAATgCTgAATCgTCCCACTCCCAAC                    | CAgCACAggCCCTCAAAAAC                         |
| Type II collagen | CACCgCTAACgTCCAgATgAC                         | gAgATgACggAggCTgCTTCTgCTT                  |
| Sox9          | AgCTgTgATAgACgggTTg                          | TCCCAgCAACAgATCTCCTA                        |
| Aggreccan     | CATTgCgCACggAggAggCCA                        | TggggTCCgTgggCTCACAA                       |
| 18s RNA       | gTAACCgTTgAACCCATT                            | CATCCAATCAgTAgTAgCg                        |