

Bionic Biphasic Composite Scaffold with Osteochondrogenic Factors for Regeneration of Full-Thickness Osteochondral Defect

Yanbo Zhang ^a, Yu Han ^d, Yachen Peng ^a, Jie Lei ^c, Fei Chang ^{b,*}

^a Department of Orthopedics, China-Japan Union Hospital of Jilin University,
Changchun, P. R. China

^b Department of Orthopedics, The Second Hospital of Jilin University, Changchun, P.
R. China

^c Department of MR, Changchun FAW General Hospital, Changchun, P. R. China

^d Department of Orthopedics, Jilin Central General Hospital, Jilin, P. R. China

* Corresponding author:

Email *adress:* ccfei_cn@hotmail.com (F. Chang)

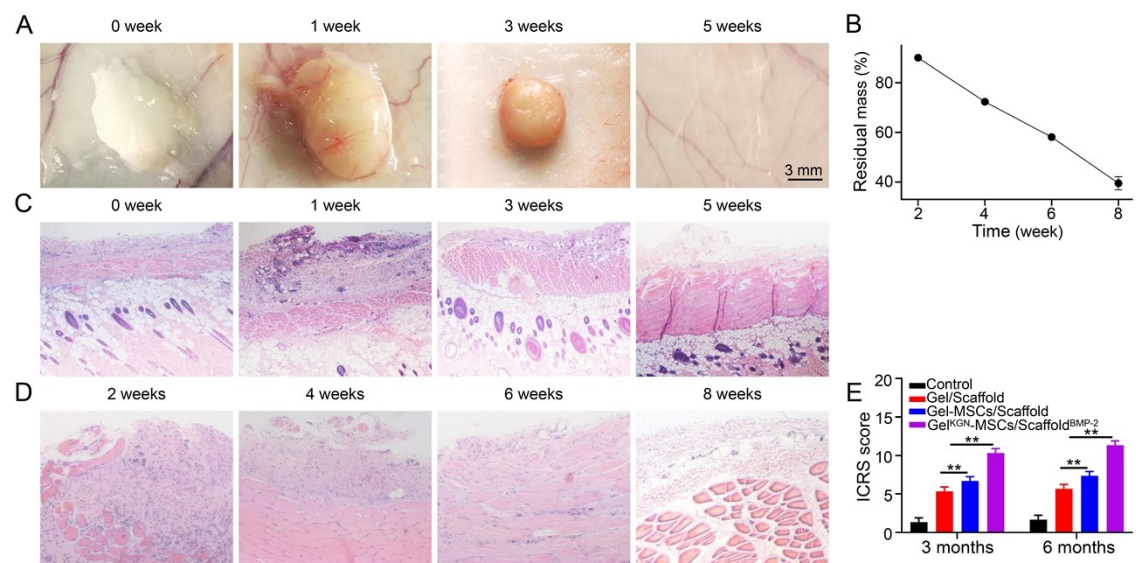


Fig. S1. In vivo degradation of mPEG-*b*-PLV thermogel **(A)** and PLGA/HA scaffold **(B)**. In vivo biocompatibility of mPEG-*b*-PLV thermogel **(C)** and PLGA/HA scaffold **(D)**. ICRS histological score **(E)**.

Table S1. ICRS Macroscopic Evaluation of Neocartilage.

Cartilage repair assessment ICRS	Points
Degree of defect repair	
In level with surrounding cartilage	4
75% repair of defect depth	3
50% repair of defect depth	2
25% repair of defect depth	1
0% repair of defect depth	0
Integration to border zone	
Complete integration with surrounding cartilage	4
Demarcating border <1 mm	3
3/4th of graft integrated, 1/4th with a notable border > 1 mm width	2
1/2 of graft integrated with surrounding cartilage, 1/2 with a notable border >1 mm	1
From no contact to 1/4th of graft integrated with surrounding cartilage	0
Macroscopic appearance	
Intact smooth surface	4
Fibrillated surface	3
Small, scattered fissures, or cracs	2
Several, small, or few but large fissures	1
Total degeneration of grafted area	0
Overall repair assessment	
Grade I: normal	12
Grade II: nearly normal	11–8
Grade III: abnormal	7–4
Grade IV: severely abnormal	3–1

Table S2. ICRS Histological Grading Scale for Cartilage Regeneration.

Description	Points
Cell morphology	
Hyaline cartilage	0
Mostly hyaline cartilage	1
Mostly fibrocartilage	2
Mostly non-cartilage	3
Non-cartilage only	4
Matrix staining (metachromasia)	
Normal (compared with host adjacent cartilage)	0
Slightly reduced	1
Markedly reduced	2
No metachromatic stain	3
Surface regularity	
Smooth (>3/4)	0
Moderate (>1/2–3/4)	1
Irregular (1/4–1/2)	2
Severely irregular (<1/4)	3
Thickness of cartilage	
>2/3	0
1/3–2/3	1
<1/3	2
Integration of donor with host adjacent cartilage	
Both edges integrated	0
One edge integrated	1
Neither edge integrated	2
Maximum total	14

Table S3. Sequences of Primers Used for Real-time PCR.

Gene	Forward primer (5'–3')	Reverse primer (5'–3')
COL2A1	TCCTGTGCGACGACATAATTCT	CCTTTGGTCCTGGTTTCC
FAM	CCTCGTCATCTTTATCTTC	CTGCGTTGTGCCTATCGT
ACAN	TCCACCATTTCGGCATAAC	TACGGATTCTACCAAAGTTCTG
SOX9	CTTCAACCTCCCGCACTAC	TTGCCTTCAGCTTCAATGTC
COL1A1	CACGGACTTTGGAGATTTGT	CACTCGGGTCTTCAAGCA
ALPL	AGGCTTCTTCCTGCTGGTG	GGGTTTCTTGTCCGTGTCG
SPP1	GCTAAACCCTGACCCATCT	CGTCGGATTCATTGGAGT
SPARC	AAACCGAAGAGGAAGTAGTGG	TTGTGGCAAAGAAGTGGC