## Supplementary Information

## Cell-free scaffold functionalized with bionic cartilage acellular matrix microspheres to enhance microfracture treatment of articular cartilage defects

Jun Liu ${ }^{\& a b}$, Yan Lu ${ }^{\& a}$, Fei Xing ${ }^{c}$, Jie Liang*a ${ }^{*}$, Qiguang Wang*a, Yujiang Fan ${ }^{\text {a }}$, Xingdong Zhang ${ }^{\mathrm{a}}$
a. National Engineering Research Center for Biomaterials, Sichuan University, 29

Wangjiang Road, Chengdu 610064, China.
b. State Key Laboratory of Bioelectronics, School of Biological Science and Medical Engineering, Southeast University, Nanjing 210096, China
c. Department of Orthopaedics, West China Hospital, Sichuan University, No. 37

Guoxue Lane, Chengdu 610041, Sichuan, China

The " $\&$ " represents an equal contribution
*Corresponding authors. E-mail address: jie_L88@126.com (Jie Liang); wqgwang@,126.com (Qiguang Wang)


Figure S1. Immunohistochemistry staining for $\mathrm{Col} \mathrm{II} \mathrm{of} \mathrm{CHMs} / \mathrm{MSCs}$ constructs after cultured in vitro for 5,10 and 15 days.

Table S1. International Cartilage Repair Society (ICRS) cartilage repair assessment tool

|  | Criteria | Points |
| :---: | :---: | :---: |
| Degree of defect repair | Level with surrounding cartilage | 4 |
|  | 75\% repairof 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 surounding cartilage | 4 |
|  | Demarcating border $<1 \mathrm{~mm}$ | 3 |
|  | $3 / 4$ of graft integrated, $1 / 4$ with a notable border $>1 \mathrm{~mm}$ width | 2 |
|  | $1 / 2$ of graft integrated with surrounding cartilage , $1 / 2$ with a notable border $>1 \mathrm{~mm}$ | 1 |
|  | From no contact to $1 / 4$ of graft integrated with surrounding cartilage | 0 |
| Macroscopic appearance | Intact smooth surface | 4 |
|  | Fibrillated surface | 3 |
|  | Small,scattered fissure or cracks | 2 |
|  | Several, smallor few but large fissures | 1 |
|  | Total degeneration of grafted area | 0 |
| Overall score | Grade I normal | 12 |
|  | Grade II nearly normal | 11-8 |
|  | Grade IIIIabnormal | 7-4 |
|  | GradeIV severely abnormal | 3-1 |

