Nano-Scaled Bionic Periosteum Orchestrating Osteogenic Microenvironment for Sequential Bone Regeneration

Hanwen Li^{1, #}, Huan Wang^{2, #}, Jun Pan^{1, #}, Jiaying Li², Kai Zhang¹, Weifeng Duan¹, Huan Liang³, Kangwu Chen¹, Dechun Geng¹, Qin Shi^{1, 2}, Huilin Yang^{1, 2, *}, Bin Li^{2, *}, Hao Chen^{1, 3*}

- 1 Department of Orthopedic Surgery, The First Affiliated Hospital of Soochow University, 899 Pinghai Road, Suzhou, Jiangsu, 215000, P. R. China.
- 2 Orthopedic Institute, Medical College, Soochow University, 708 Renmin Road, Suzhou, Jiangsu, 215000, P. R. China.
- 3 Medical College, Yangzhou University, 136 Jiangyang Road, Yangzhou, Jiangsu 225009, P. R. China.

[#]These authors contributed equally to this word.

* Correspondence should be addressed to:

Dr. Hao Chen. Email: haochen@suda.edu.cn

Department of Orthopedics, The First Affiliated Hospital of Soochow University, 899 Pinghai Road, Suzhou, Jiangsu, 215000, P. R. China.

Prof. Bin Li. Email: binli@suda.edu.cn

Orthopedic Institution, Soochow University, 708 Renmin Road, Suzhou, Jiangsu, 215000, P. R. China.

Prof. Huilin Yang. Email: suzhouspine@163.com Department of Orthopedics, The First Affiliated Hospital of Soochow University, 899 Pinghai Road, Suzhou, Jiangsu, 215000, P. R. China.

Supporting Information

Figure S1



Figure S1. Anti-inflammation effect of h-MnO₂ nanoparticles. A. Live/dead staining of BMSCs treated with 400 μ M H₂O₂ or 0.1mg/ml h-MnO2 nanoparticles or both. B. Representative images of cyclooxygenase-2 (COX2) immunohistochemistory staining with the scaffolds collected from 2 weeks or 4 weeks cranial defect models.



Figure S2

Figure S2. A. Representative images of PDGF-BB (green) staining in scaffolds from different groups. In all immunofluorescence staining, DAPI (blue) was used as a nuclear counterstain; B. Quantification of PDGF-BB staining. C. Immunohistochemical staining of HIF-1 in scaffolds from different groups. ANOVA test was applied for statistical analysis. * stands for p<0.05, ** stands for p<0.01