

## Supporting information

### **Piezoelectric Nylon-11 Nanoparticles with Ultrasound Assistance for High-efficiency Promotion of Stem Cells Osteogenic Differentiation**

*Baojin Ma<sup>‡1</sup>, Feng Liu<sup>‡1</sup>, Zhao Li<sup>1</sup>, Jiazhi Duan<sup>1</sup>, Ying Kong<sup>1</sup>, Min Hao<sup>1</sup>, Shaohua Ge<sup>4\*</sup>, Huaidong Jiang<sup>3\*</sup> and Hong Liu<sup>1,2\*</sup>*

1 State Key Laboratory of Crystal Materials, Shandong University, Jinan, Shandong, 250100, China

2 Institute for Advanced Interdisciplinary Research, Jinan University, Jinan, Shandong, 250100, China

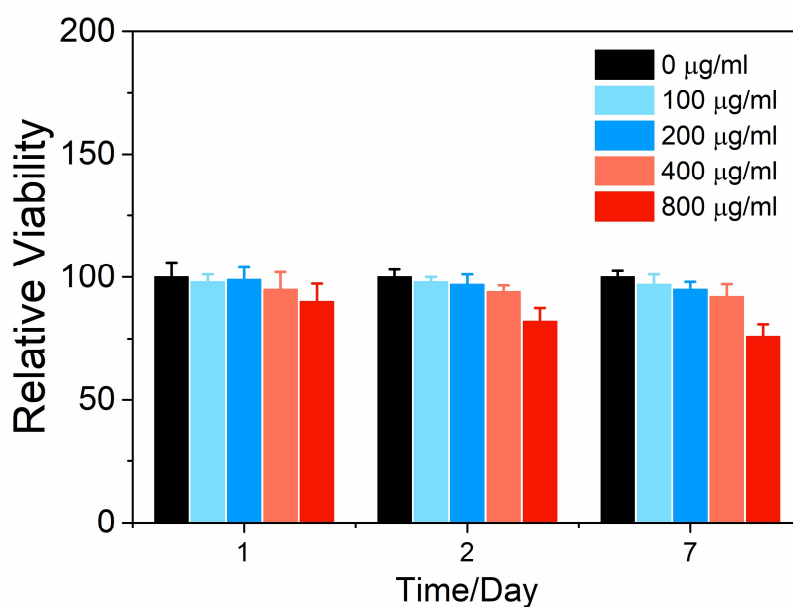
3 School of Physical Science and Technology, Shanghai Tech University, Shanghai 201210, China

4 Shandong Provincial Key Laboratory of Oral Tissue Regeneration, School of Stomatology, Shandong University, Jinan, Shandong, 250100, China

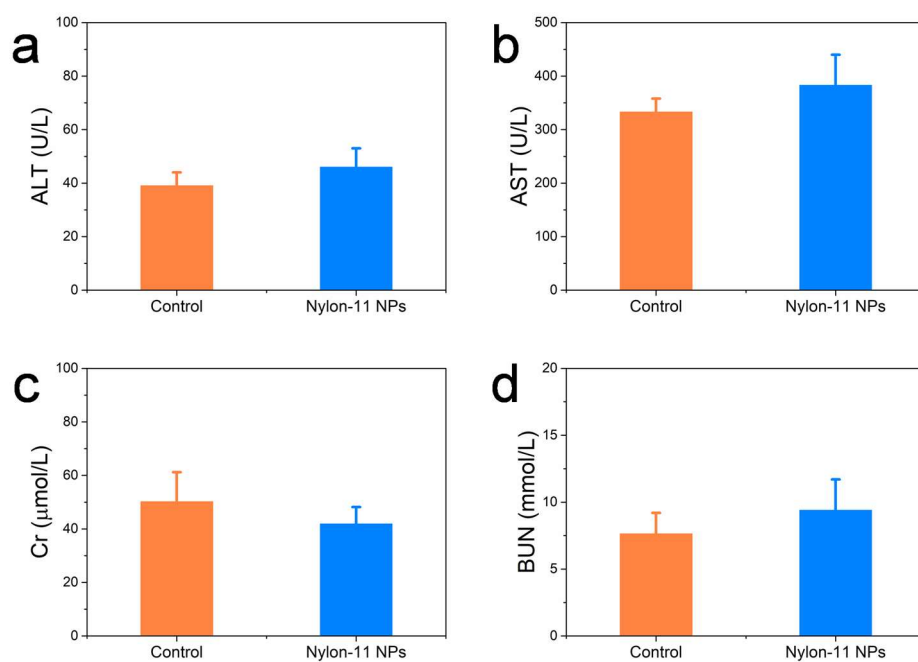
Supplementary Figures



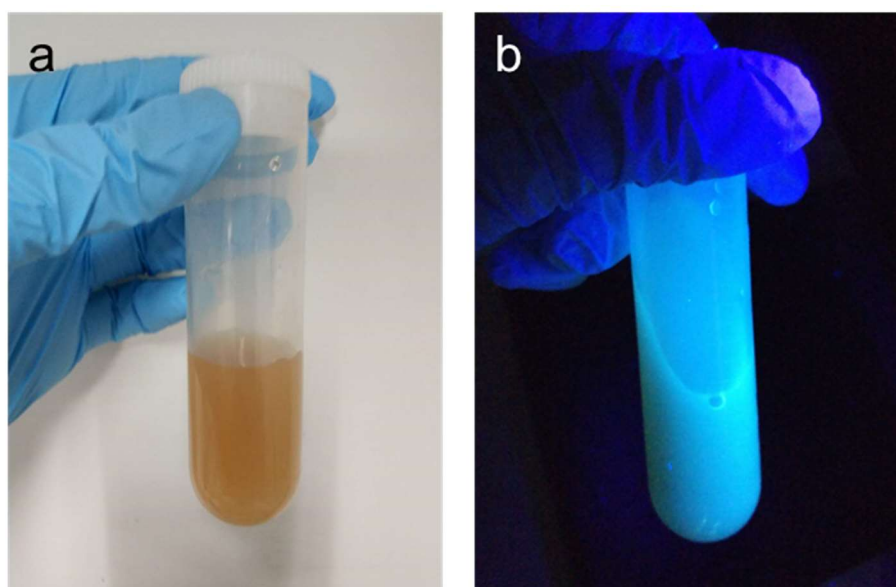
**Fig. S1** Physical picture of nylon-11 NPs in mass production.



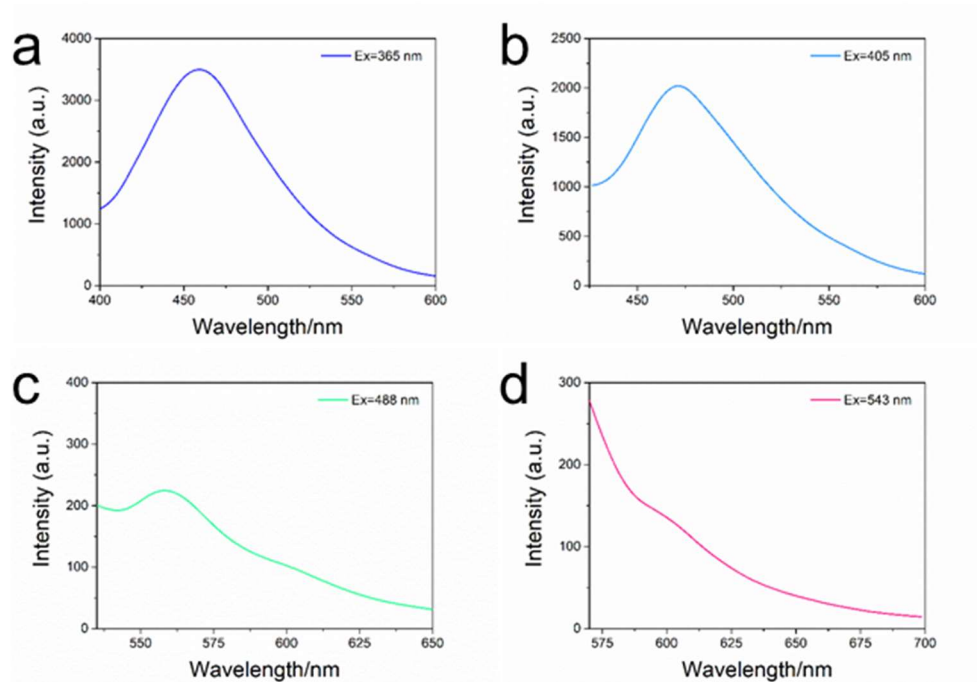
**Fig. S2** CCK-8 result of DPSCs co-cultured with nylon-11 NPs under different concentration after 1 d, 2 d, and 7 d.



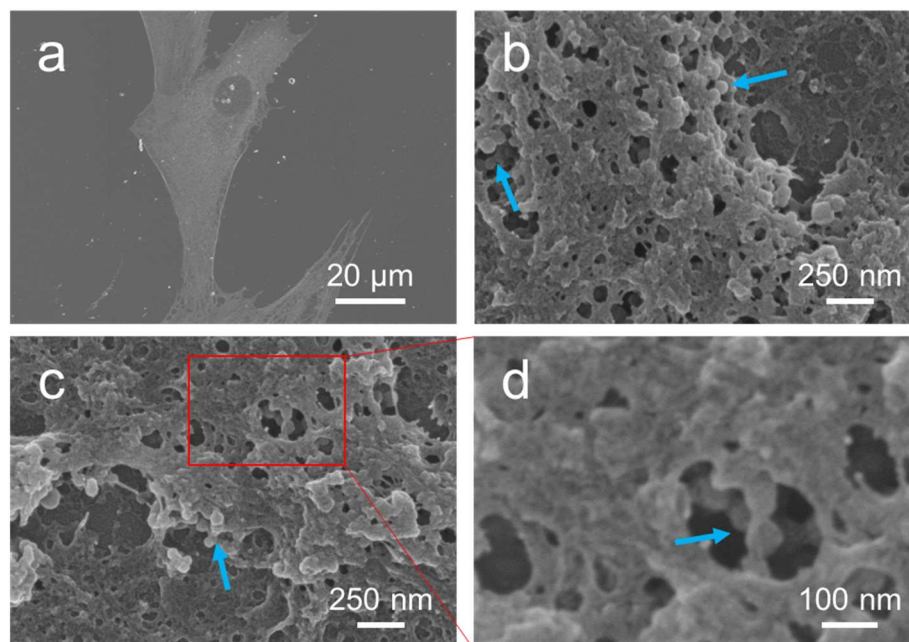
**Fig. S3** The levels change of ALT (a), AST (b), Cr (c) and BUN (d) in blood in control groups and nylon-11 NPs treated groups.



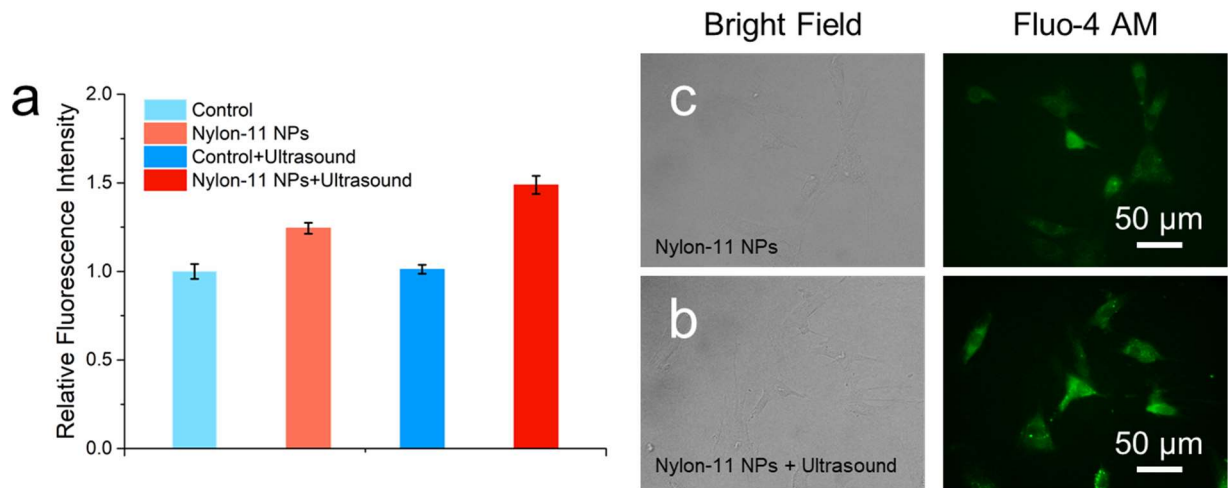
**Fig. S4** Physical picture of fluorescent OPDA coated nylon-11 NPs under nature light and UV light (365 nm).



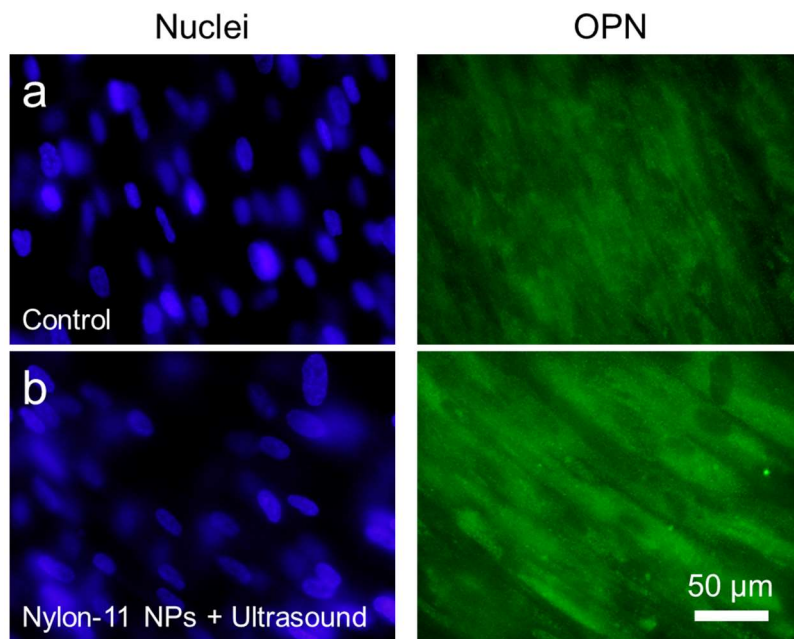
**Fig. S5** Emission spectra of fluorescent OPDA coated nylon-11 NPs under different excitation wavelength. a) under 365 nm. b) under 405 nm. c) under 488 nm. d) under 543 nm.



**Fig. S6** The SEM images of nylon-11 NPs ingestion by DPSCs after alcohol gradient dehydration. Blue arrows show the location of nylon-11 NPs.



**Fig. S7** The content change of Ca<sup>2+</sup> ions in cells. (a) Relative fluorescence intensity in different conditions. (b) Fluorescence images of DPSCs treated with nylon-11 NPs without and with ultrasound.



**Fig. S8** The magnification images of nuclei and OPN immunofluorescence staining of blank control group (a) and nylon-11 NPs (200  $\mu$ g/ml) with ultrasound assistance group (b).