

Supporting Information for

**Ordered inverse-opal scaffold based on bionic transpiration  
for biomimetic spine**

Yanru Yang,<sup>a</sup> Bingbing Gao,<sup>b</sup> Yangnan Hu,<sup>c</sup> Hao Wei,<sup>d</sup> Chen Zhang,<sup>e</sup> Renjie Chai,<sup>\*c,e,f,g</sup> and  
Zhongze Gu<sup>\*a</sup>

<sup>a</sup> State Key Laboratory of Bioelectronics, Southeast University, Nanjing 210096, China

<sup>b</sup> School of Pharmaceutical Sciences, Nanjing Tech University, Nanjing 211816, China

<sup>c</sup> State Key Laboratory of Bioelectronics, School of Life Sciences and Technology, Jiangsu Province High-Tech Key Laboratory for Bio-Medical Research, Southeast University, Nanjing 210096, China

<sup>d</sup> Department of Otorhinolaryngology Head and Neck Surgery, Drum Tower Clinical Medical College, Nanjing Medical University, Nanjing 210008, China. <sup>e</sup> Co-Innovation Center of Neuroregeneration, Nantong University, Nantong 226001, China

<sup>f</sup> Institute for Stem Cell and Regeneration, Chinese Academy of Science, Beijing 100101, China.

<sup>g</sup> Beijing Key Laboratory of Neural Regeneration and Repair, Capital Medical University, Beijing 100069, China

\*E-mail: renjiech@seu.edu.cn (R. J. C.); gu@seu.edu.cn (Z. Z. G.)

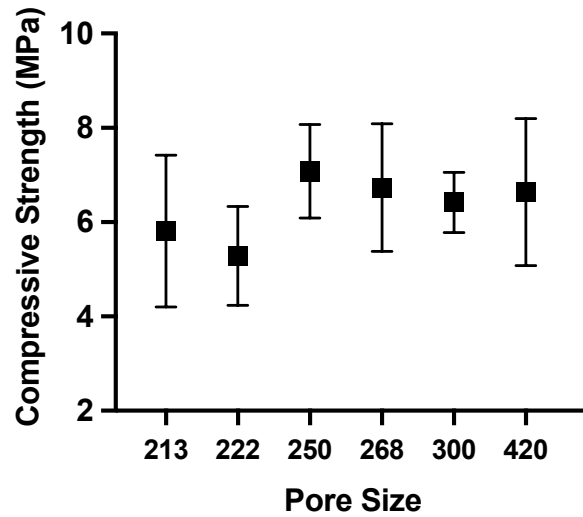


Fig. S1. Average compressive strength of scaffolds with five architectures at different porosity levels. Vertical error bars represent the standard deviations of measured compressive strength.

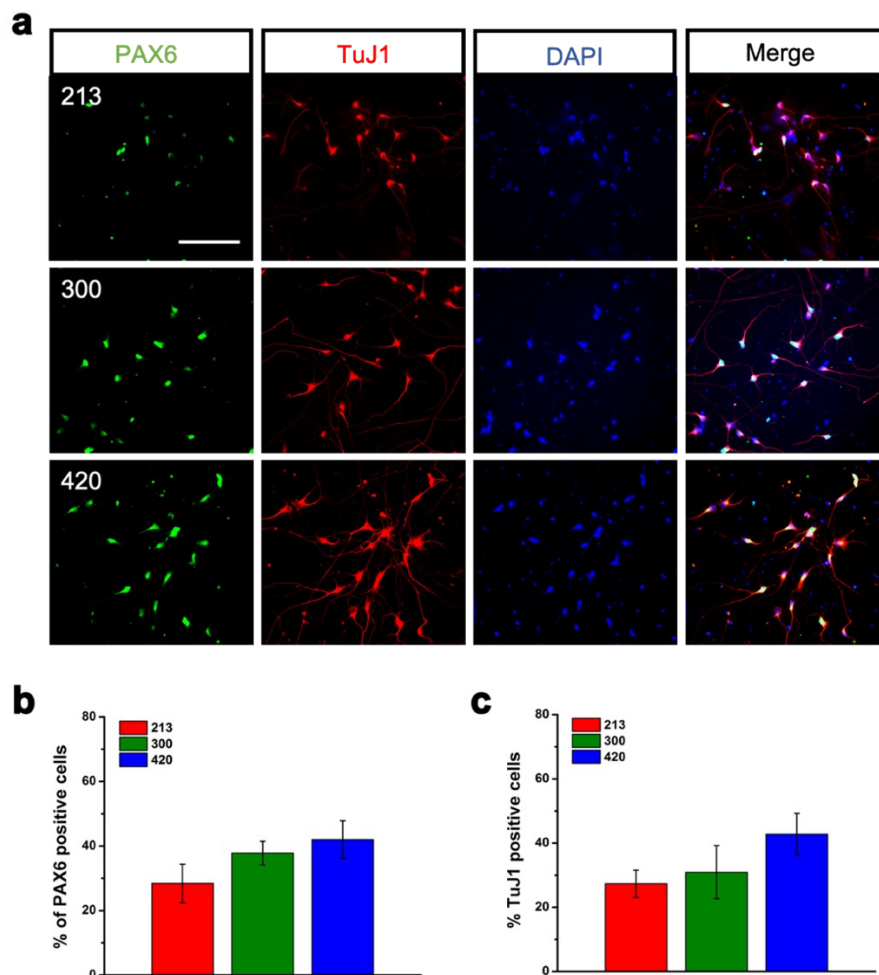


Fig. S2. Immunofluorescence staining of TuJ1 and PAX6 in cells cultured for 35 days on the inverse carbon scaffolds. (a) The proficiency of neural differentiation assessed by PAX6 staining, with TuJ1 indicating neurons. (b) Quantification of the PAX6-positive and (c) TuJ1-positive cells cultured on bionic scaffolds. Scale bar is 100  $\mu$ m. The data are presented as the mean  $\pm$  SD, n=5.

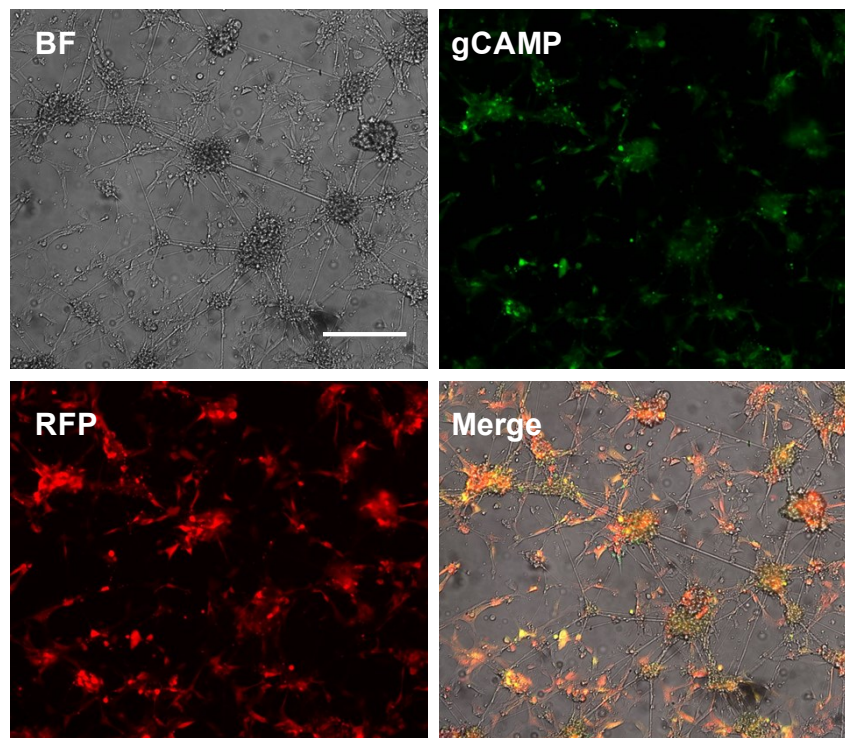


Fig. S3. Expression of gCAMP6s virus in nerve cells on the bionic spine for iPSCs 35 days culture. The BF in the figure stands for bright field, RFP (in red) represents the RFP represents the organism of the gCAMP6 virus. gCAMP6 (in green) means the gCAMP6 proteins expressed in neurons. Scale bar is 50  $\mu\text{m}$ .