

## Supplementary Information

### **Piezoelectrical Hydrogel Containing Cationic Vacancies Bismuth Sulfide with Enhanced Sonodynamic/Nanozyme Activity for Synergistic Killing Bacteria and Boosting Osteoblast Differentiation**

Xiaowen Xi <sup>a</sup>, Susu Ma <sup>b</sup>, Ping Sun <sup>c\*</sup>, Zhitao Hu <sup>a</sup>, Jie Wei <sup>a\*</sup> and Yunfei Niu <sup>b,d\*</sup>

a. Shanghai Key Laboratory of Advanced Polymeric Materials, School of Materials Science and Engineering, East China University of Science and Technology, Shanghai, 200237, PR China

b. Department of Trauma Orthopaedics, the first affiliated hospital of Naval Medical University, 168 Changhai Road, Shanghai, 200433, PR China

c. Shanghai Eighth Peoples Hospital, Department of Orthopedics, Shanghai, 200235, PR China

d. Shidong Hospital affiliated to University of Shanghai for Science and Technology, 999 Shiguang Road, Shanghai, 200438, PR China

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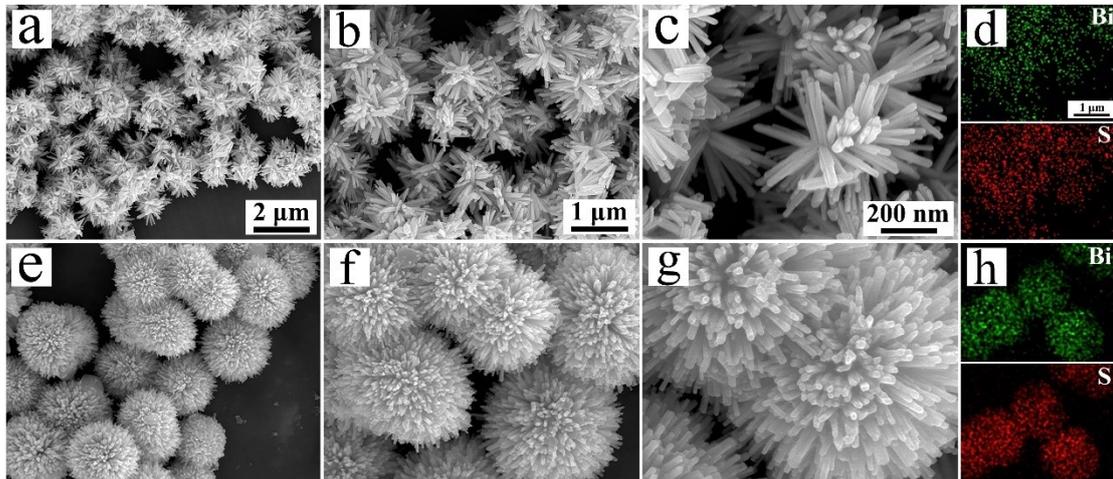
1. **Table S1** Primer sequences used for RT-qPCR.
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**Table S1** Primer sequences used for RT-qPCR

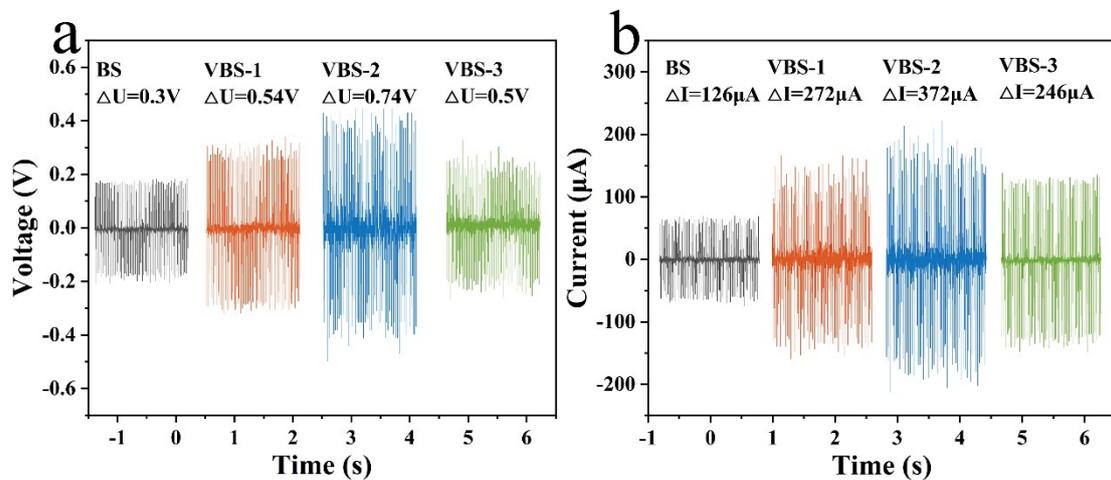
Gene	Forward primer sequence (5'-3')	Reverse primer sequences (5-3)
Runx2	TGTCGCCCACTCACTACC	TCCATCAGCGTCAACACCATCATTC
ALP	TGTACGGCAAGGCTTCGCATC	GAGCAGAGCAGACAGGTGAAGCTTC
OPN	GACGATGATGACGACGACGATGAC	GTGTGCTGGCAGTGAAGGACTC
OCN	GGACCCTCTCTGCTCACTCTG	ACCTTACTGCCCTCTGCTTGG

**Table S2** Chemical compositions estimated by ICP

Atomic ratio	Bi	S
BS	2.06	3.02
VBS-2	1.82	3



**Fig. S1** (a-c) SEM images of VBS-1 at different magnifications. (d) The corresponding elemental mapping of VBS-1. (e-g) SEM images of VBS-3 at different magnifications. (h) The corresponding elemental mapping of VBS-3.



**Fig. S2** Open-circuit voltage (a) and short-circuit current (b) of different samples under ultrasound ( $0.5 \text{ W/cm}^2$ ).

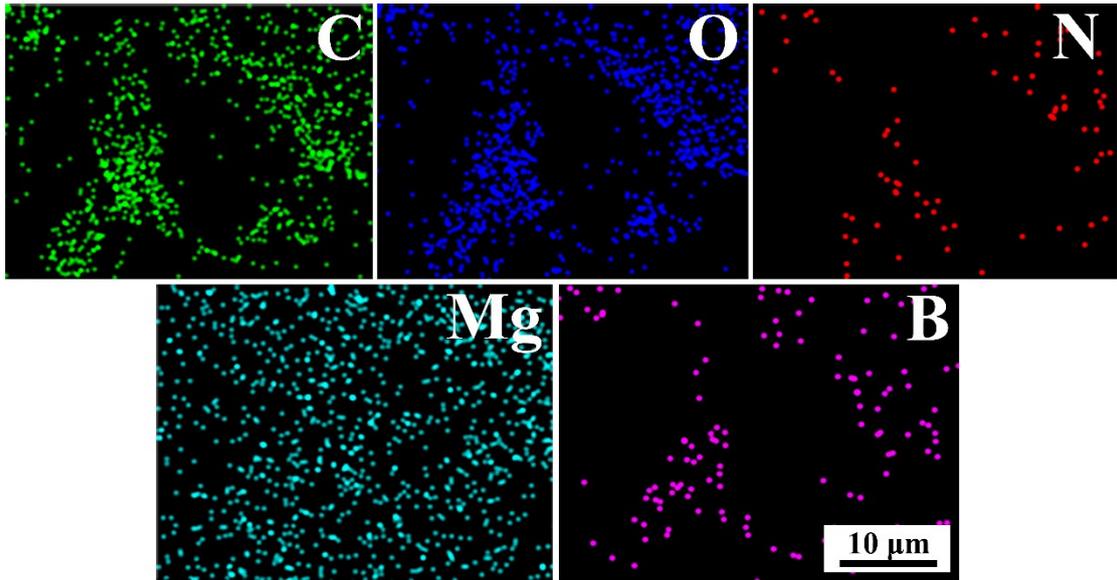


Fig. S3 The corresponding elemental mapping of freeze-dried PSA hydrogel.

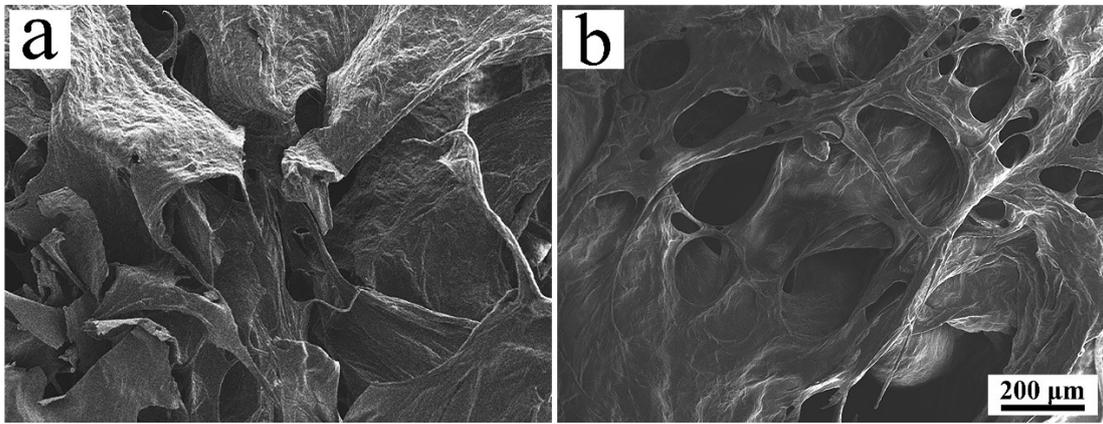
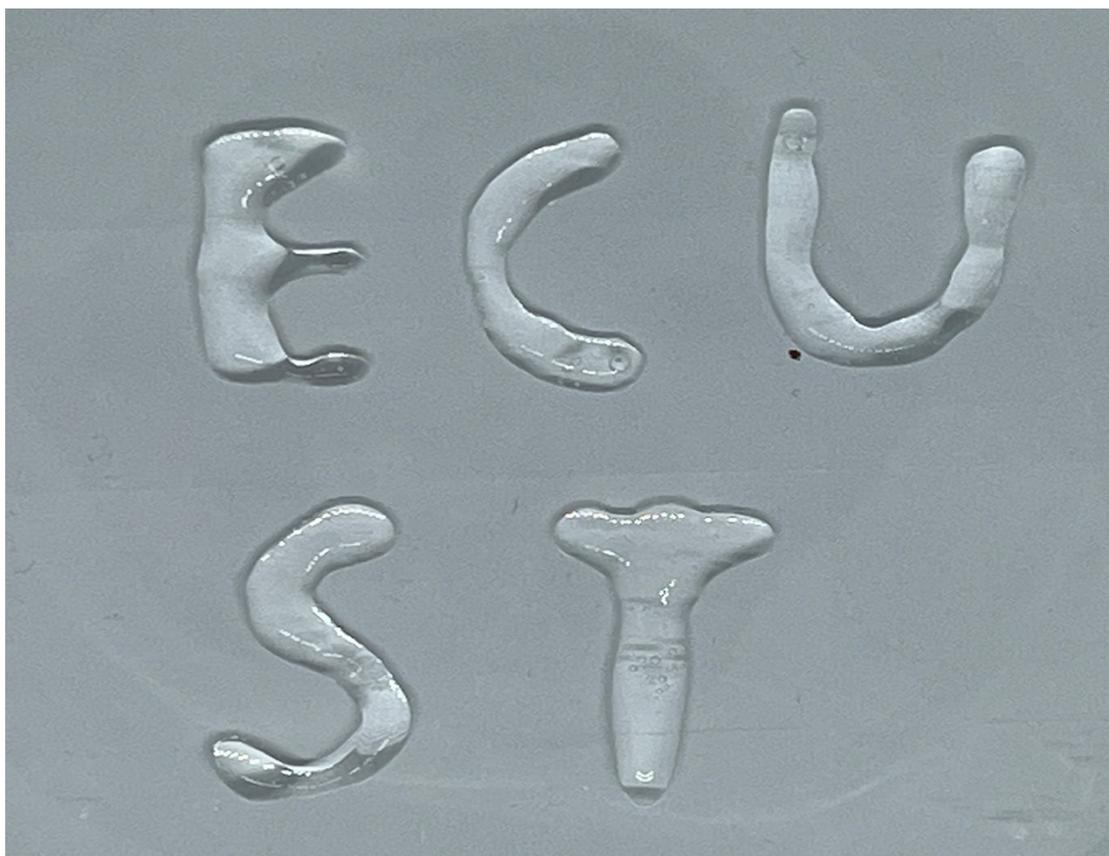


Fig. S4 SEM images of PSA hydrogels after 3 h (a) and 6 h (b) of reaction under  $H_2O_2$  solution.



**Fig. S5** Injectability of PSA hydrogel.