## Resistance to Long-term Bacterial Biofilm Formation Based on Hydrolysis-Induced Zwitterions Material with Biodegradable and Self-healing Properties

Jun Ma<sup>a</sup>, Weifeng Lin<sup>a</sup>, Liangbo Xu<sup>a</sup>, Sihang Liu<sup>a</sup>, Weili Xue<sup>a</sup>, Shengfu Chen<sup>a, b, c</sup> \*

<sup>a</sup> State Key Laboratory of Chemical Engineering, Department of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, P. R. China

<sup>b</sup> Institute of Zhejiang University-Quzhou, Quzhou 324000, China

<sup>c</sup> Jiangsu Collaborative Innovation Center of Biomedical Functional Materials, Jiangsu Key Laboratory of Biomedical Materials, College of Chemistry and Materials Science, Nanjing Normal University, Nanjing 210046, China

\* To whom correspondence should be addressed: *E-mail: <u>schen@zju.edu.cn</u>;* 



Figure S1. <sup>1</sup>H NMR spectra of ECBEMA in CDCl<sub>3</sub>

The <sup>1</sup>H NMR spectra of ECBEMA was shown in Figure S1. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm): 6.11 (m, 1H), 5.56 (m, 1H), 4.21 (t, 2H), 4.12 (q, 2H), 2.87 (t, 2H), 2.78 (t, 2H), 2.61 (t, 2H), 2.47 (s, 3H), 1.94 (s, 3H), 1.26 (t, 3H), 1.05 (t, 3H).







**Figure S2.** <sup>1</sup>H NMR spectra of PLA diol in CDCl<sub>3</sub> ((a) PLA3000, (b) PLA2000, (c) PLA800)

According to the <sup>1</sup>H NMR spectra, the molecular weight of PLA diol was obtained by the formula,  $M_n=(I_c/I_a+1)\times72\times2+90$ . In this formula,  $I_c$  represents the peak area of the characteristic chemical shift of H belonging to the CH bond in the lactic acid group ( $M_n=72$  Dalton) which is the repeated unit in the PLA diol chain.  $I_a$ indicates the peak area of the characteristic chemical shift of H belonging to the CH bond in the lactic acid group which is at both ends of the PLA diol chain. Moreover, the molecular weight of 1,4-butanediol is 90 Dalton.

Hence, we processed detailed calculation to obtain the molecular weight of PLA diol, and the results were as follows.

PLA3000 M<sub>n</sub>=(19.27/1+1)×72×2+90=2998.88 Dalton

PLA2000  $M_n = (12.72/1+1) \times 72 \times 2+90 = 2065.68$  Dalton

PLA800  $M_n$ =(3.93/1+1)×72×2+90=799.92 Dalton