Supporting Information

A Self-defense Hierarchical Antibacterial Surface with Inherent Antifouling and Bacteria-activated Bactericidal Properties for Infection Resistance

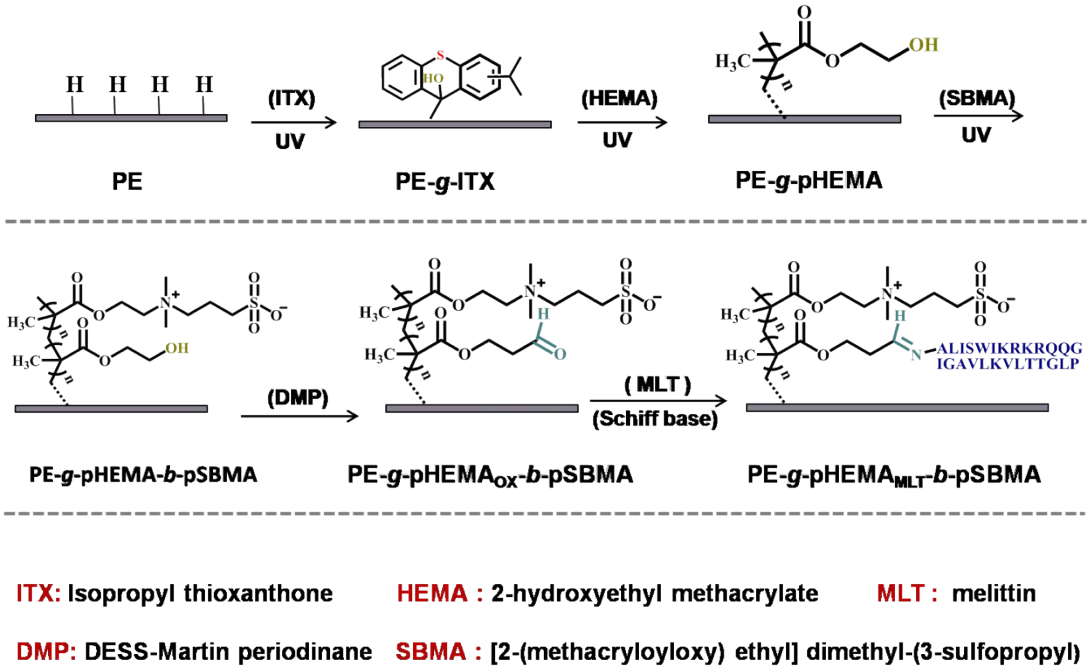
Lu Wang[a,b,c], Liwei Sun[b], Xu Zhang[b], Huiyan Wang[a,c]*, Lingjie Song[b]* and Shifang Luan[b]

[a] Jilin Agricultural University, School of Life Science, Changchun 130118, P. R. China

[b] State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, P. R. China.

[c] Jilin Medical University, Jilin 132013, P. R. China

*Corresponding contributor. E-mail:jlmpcwhy@163.com; songlj@ciac.ac.cn



ITX: Isopropyl thioxanthone **HEMA :** 2-hydroxyethyl methacrylate **MLT :** melittin

DMP: DESS-Martin periodinane **SBMA :** [2-(methacryloyloxy) ethyl] dimethyl-(3-sulfopropyl)

Figure S1. Schematic diagram of the synthesis route of a pH responsive hierarchical antibacterial surface on PE matrix.

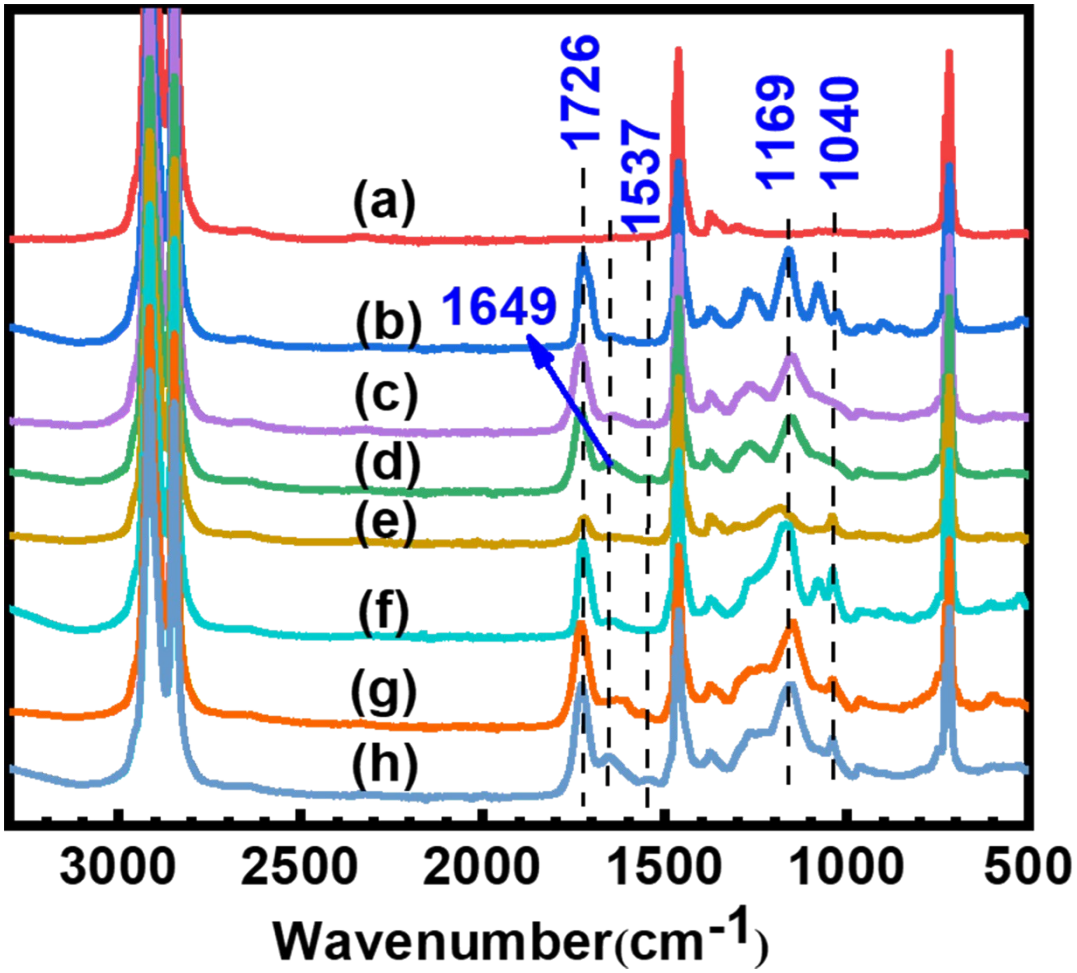


Figure S2. ATR-FTIR spectra of the sample surfaces: (a) pristine PE surface, (b) PE-*g*-pHEMA, (c) PE-*g*-pHEMA$_{OX}$, (d) PE-*g*-pHEMA$_{MLT}$, (e) PE-*g*-pSBMA, (f) PE-*g*-pHEMA-*b*-pSBMA, (g) PE-*g*-pHEMA$_{OX}$-*b*-pSBMA and (h) PE-*g*-pHEMA$_{MLT}$-*b*-pSBMA.

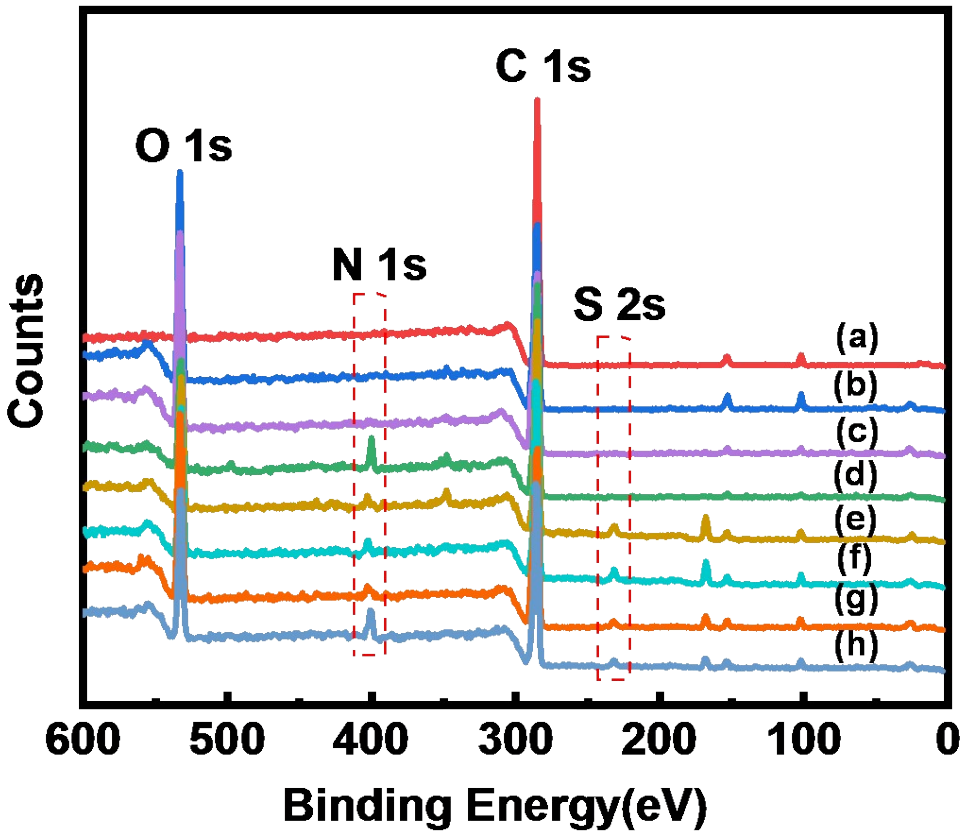


Figure S3. XPS analysis of different sample surfaces: (a) pristine PE surface, (b) PE-*g*-pHEMA, (c) PE-*g*-pHEMA$_{OX}$, (d) PE-*g*-pHEMA$_{MLT}$, (e) PE-*g*-pSBMA, (f) PE-*g*-pHEMA-*b*-pSBMA, (g) PE-*g*-pHEMA$_{OX}$-*b*-pSBMA and (h) PE-*g*-pHEMA$_{MLT}$-*b*-pSBMA.

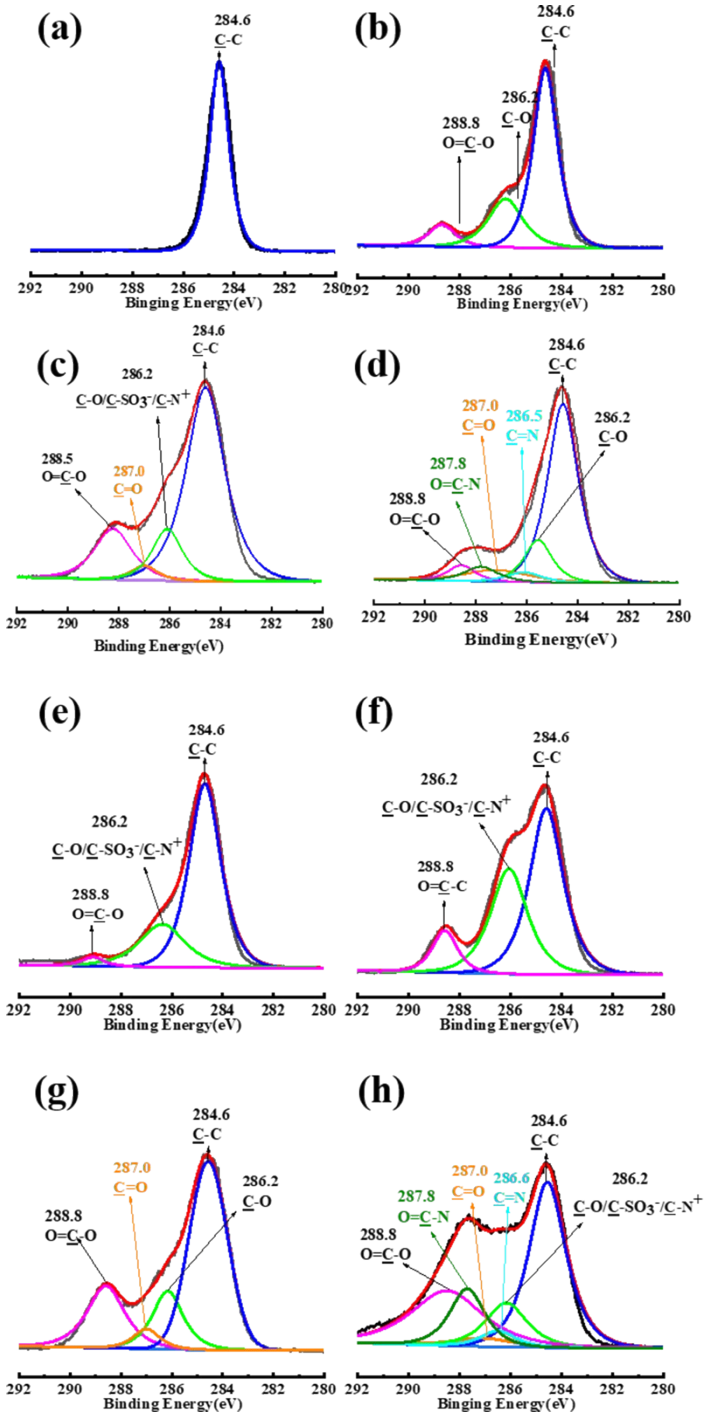


Figure S4. High-resolution C 1s XPS spectra and their peak-fitting curves of the samples: (a) PE, (b) PE-*g*-pHEMA, (c) PE-*g*-pHEMA$_{OX}$, (d) PE-*g*-pHEMA$_{MLT}$, (e) PE-*g*-pSBMA, (f) PE-*g*-pHEMA-*b*-pSBMA, (g) PE-*g*-pHEMA$_{OX}$-*b*-pSBMA, (h) PE-

g-pHEMA$_{MLT}$-*b*-pSBMA.

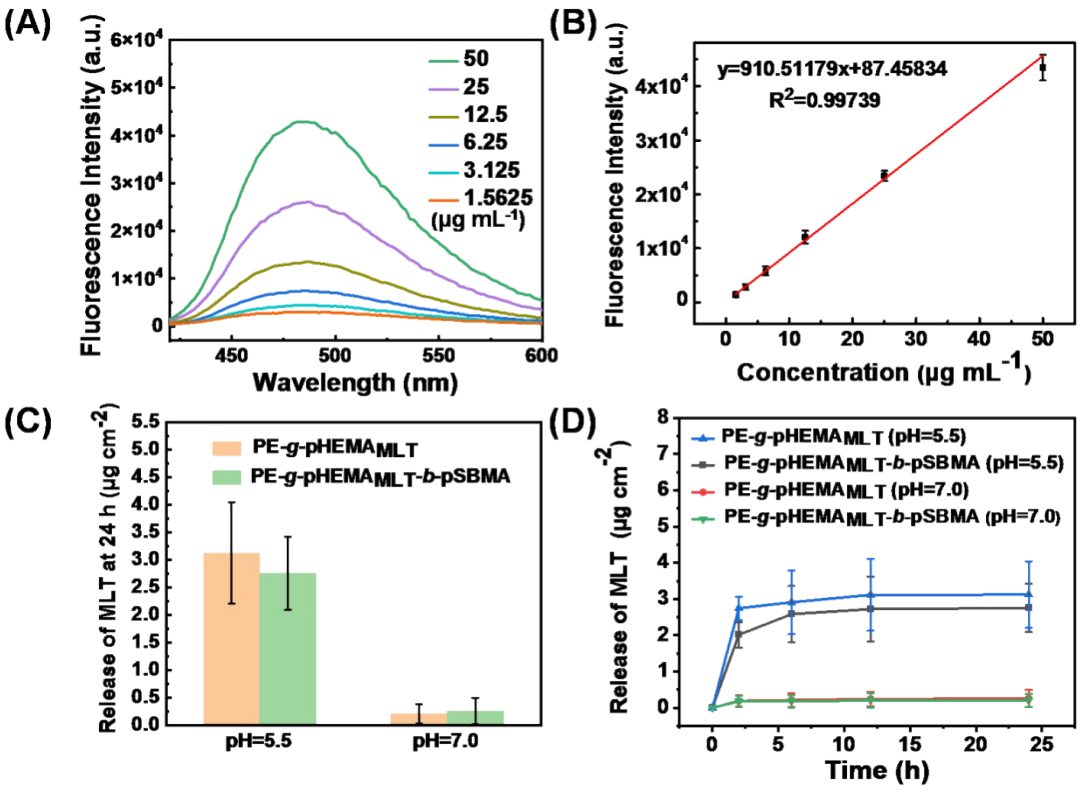


Figure S5. (A) The fluorescence adsorption curves of fluorescamine after reacting with MLT at different concentrations ranging from 1.5625 μg mL^{-1} to 50 μg mL^{-1}. (B) The linear relations of fluorescence intensity as a function of MLT concentration. (C) The released amounts of MLT from different surfaces at pH=5.5 and pH=7.0. (D) Time-dependent release profile of MLT under different conditions. (Error bars: standard deviation, n = 3).