

## Support Information

*for*

### **Photo-switchable supramolecular comb-like polymer brush based on host-guest recognition for use as antimicrobial smart surface**

Si Yu Zheng<sup>a,\*</sup>, †, Yifeng Ni<sup>a</sup>, †, Jiahui Zhou<sup>a</sup>, Yucong Gu<sup>a</sup>, Yiting Wang<sup>a</sup>, Jingfeng Yuan<sup>a</sup>, Xiaoyu Wang<sup>a</sup>, Dong Zhang<sup>b,\*</sup>, Shanqiu Liu<sup>a</sup>, Jintao Yang<sup>a,\*</sup>

<sup>a</sup> College of Materials Science & Engineering, Zhejiang University of Technology, Hangzhou 310014, P. R. China.

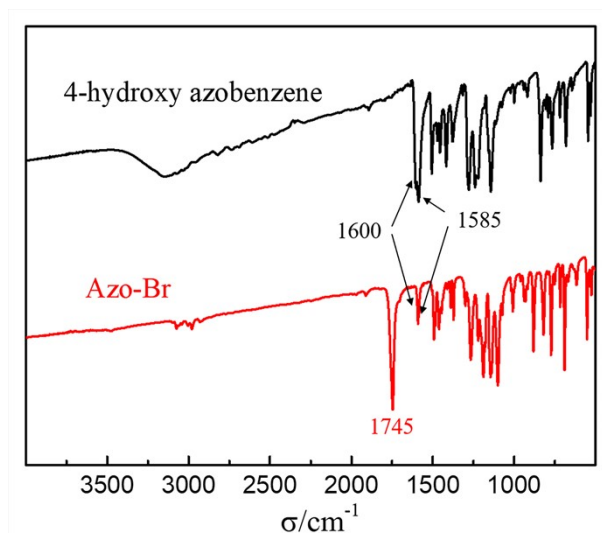
<sup>b</sup> Department of Chemical, Biomolecular, and Corrosion Engineering, College of Engineering and Polymer Science, The University of Akron, Ohio 44325, United States.

† These authors contributed equally.

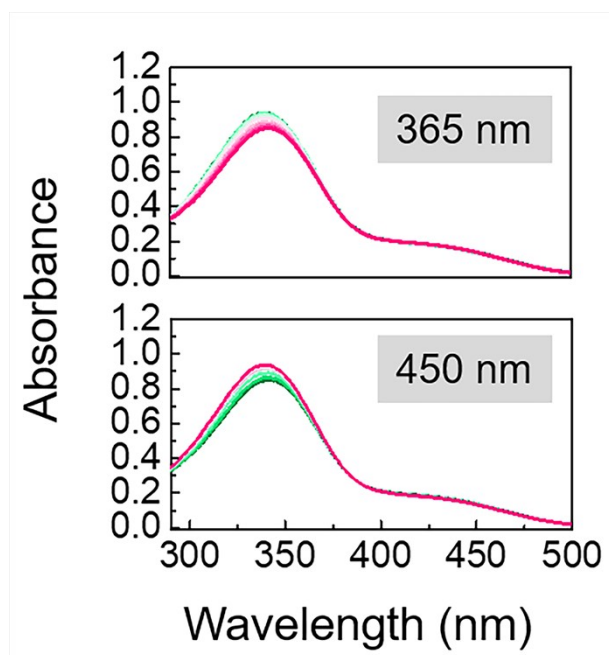
Corresponding authors: Emails: [dz39@uakron.edu](mailto:dz39@uakron.edu) (D. Zhang), [zhengsiyu@zjut.edu.cn](mailto:zhengsiyu@zjut.edu.cn) (S. Y. Zheng), [yangjt@zjut.edu.cn](mailto:yangjt@zjut.edu.cn) (J. Yang).

**Table S1.** XPS atomic concentrations of different surfaces.

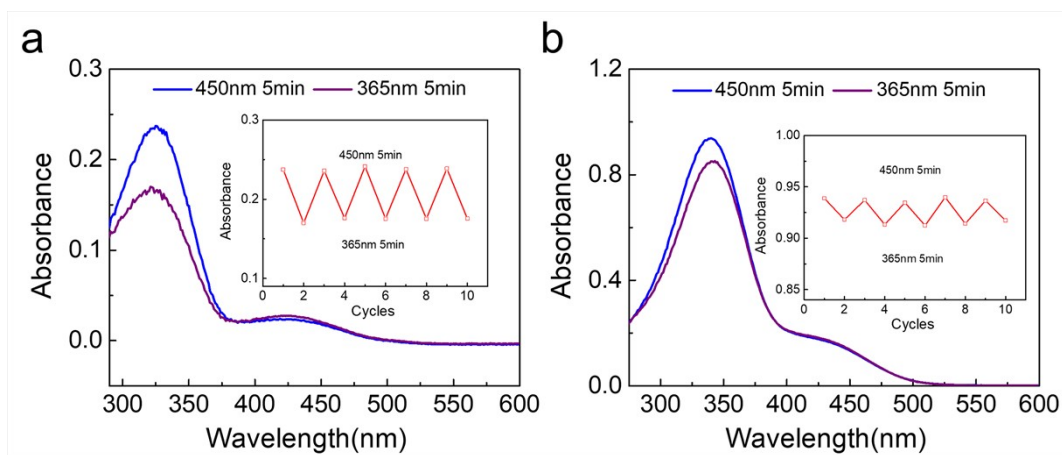
Samples	Element content (%)			
	C	O	S	N
PHG	70.19	29.81	~0	~0
PHGCD	66.80	30.22	~0	2.98
PHGAS	67.93	26.48	3.36	2.23
PHGASM	72.87	24.73	0.63	1.77



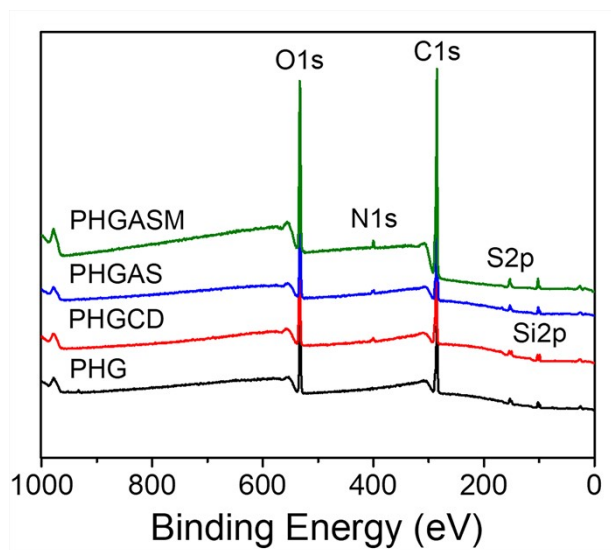
**Fig. S1** The FT-IR spectra comparison of Azo-Br and 4-hydroxy azobenzene.



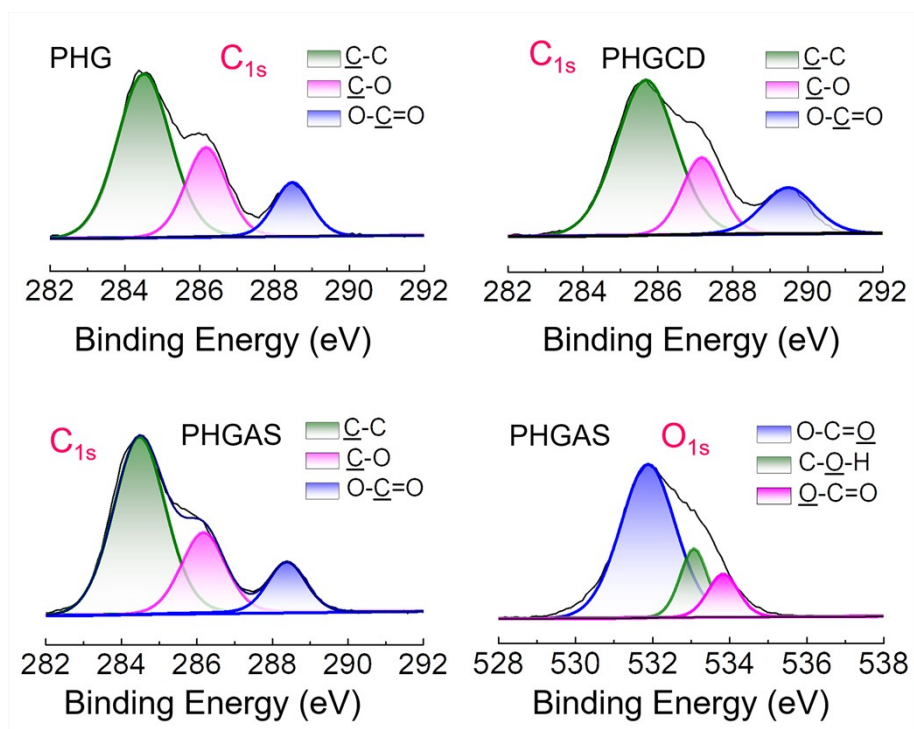
**Fig. S2** UV-vis spectra of Azo-PMETAC under the irradiation of 365 nm UV and 450 nm in H<sub>2</sub>O.



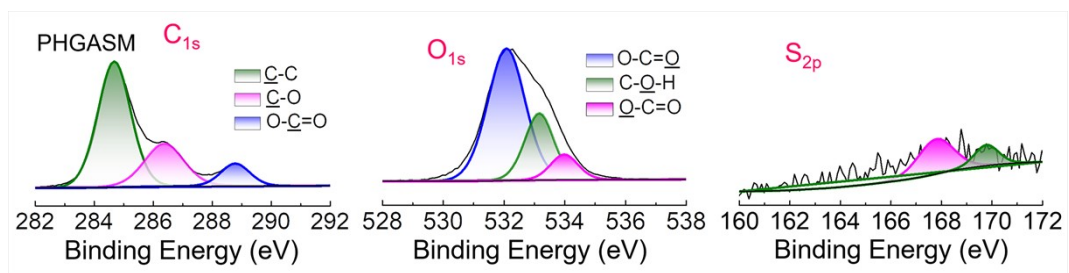
**Fig. S3** Photoresponsive cyclic stability of (a) Azo-PSBMA and (b) Azo-PMETAC solution under 450 nm 5 min and 365 nm 5 min light switching.



**Fig. S4** XPS spectra of PHG, PHGCD, PHGAS and PHGASM surfaces.

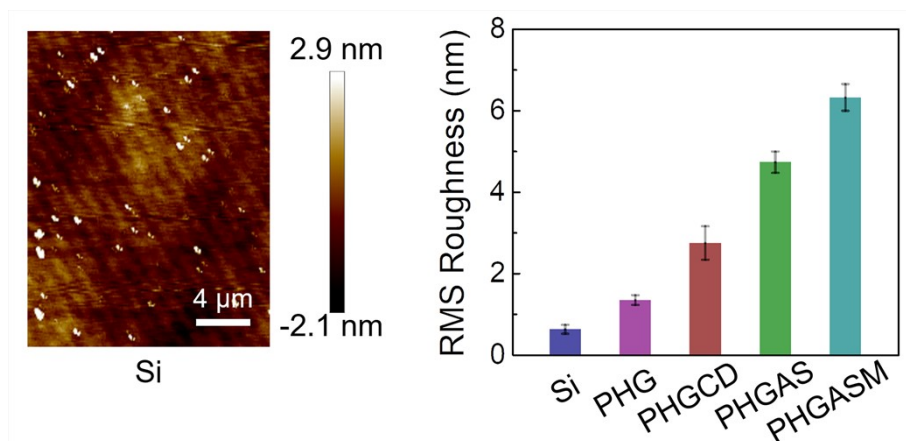


**Fig. S5** XPS spectra comparison for C<sub>1s</sub> and O<sub>1s</sub> high-resolution survey scanning of PHG, PHGCD, PHGAS surfaces.

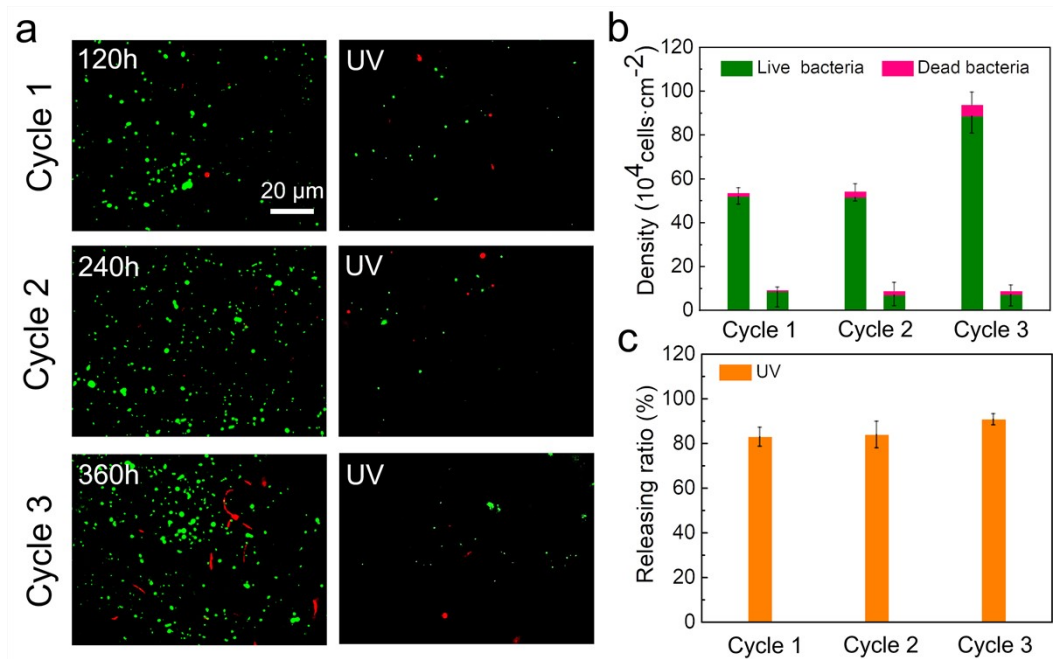


**Fig. S6** XPS spectra comparison for C1s, O1s and S2p high-resolution survey scanning of PHGASM surfaces.

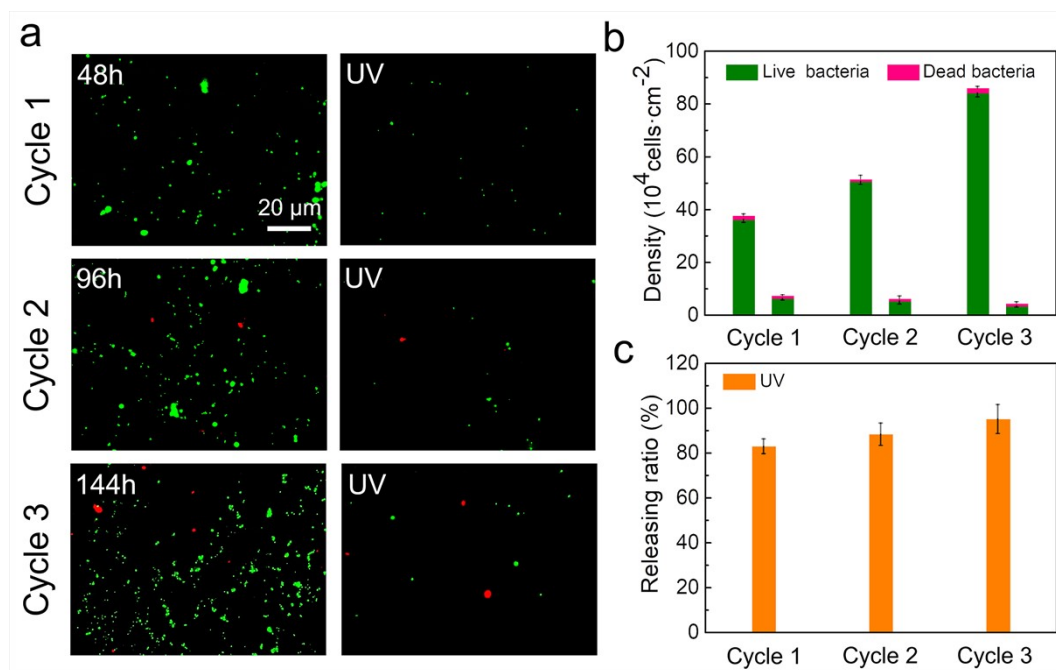




**Fig. S7** Representative AFM images and the corresponding cycle RMS roughness on different surfaces about the Si, PHG, PHGCD, PHGAS and PHGASM surfaces. (Scale bar is 4 μm).



**Fig. S8** Representative fluorescence microscopy and corresponding live/dead cell statistical analysis to show the *E. coli* cyclic releasing properties of Azo-PSBMA/P(HEMA-co-GMA) upon the treatment of 365 nm light irradiation. (Scale bar is 20  $\mu\text{m}$ ).



**Fig. S9** Representative fluorescence microscopy and corresponding live/dead cell statistical analysis to show the *S. aureus* cyclic releasing properties of Azo-PSBMA/P(HEMA-co-GMA) upon the treatment of 365 nm light irradiation. (Scale bar is 20  $\mu\text{m}$ ).