Supplementary Information

Two-dimensional photonic crystal hydrogel biosensor for colorimetric detection of penicillin G and penicillinase inhibitor

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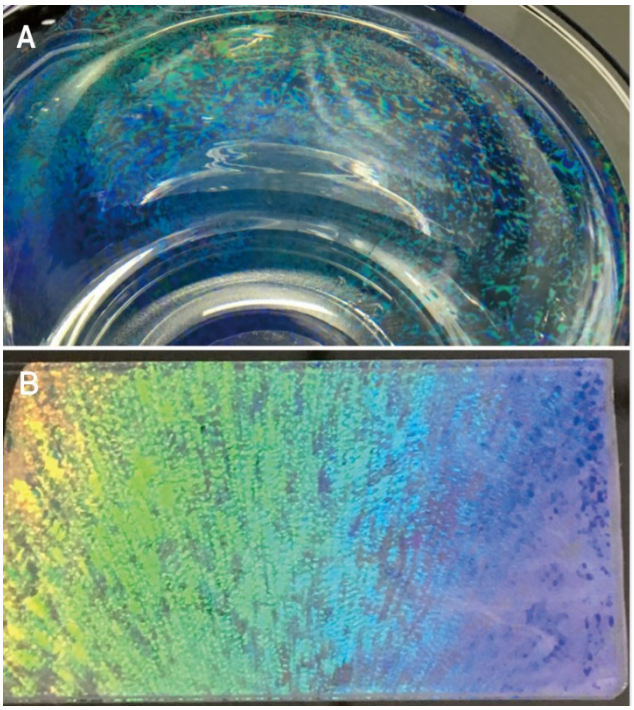

Fig. S1 (A) PS nanoparticles self-assemble into 2DPC array on the water surface. (B) The 2DPC array on a clean glass slide.

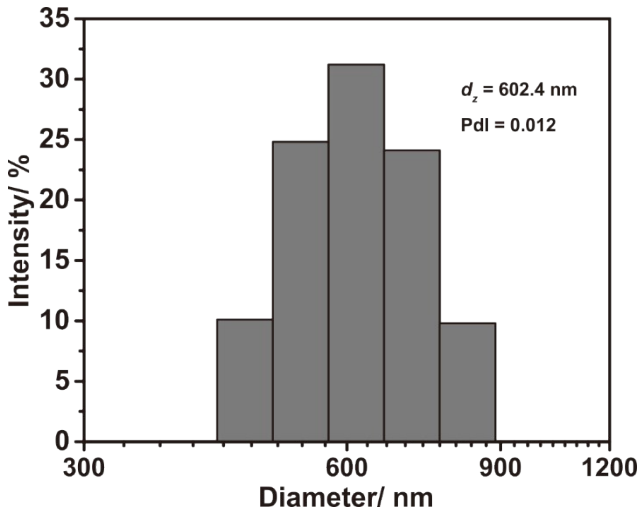

Fig. S2 Particle size distribution diagram of PS microspheres.

Table S1 Biosensors for the detection of penicillin G

Bioreceptor	Sensor array	Linear range	LOD	Ref.
Penicillinase	CNTs/enzyme-lipid LB	10 μM-5 mM	10 μM	1
Penicillinase	Al-p-Si-SiO_2-Ta_2O_5-TMV	0.1-10 mM	50 μM	2
Penicillinase	BSA-GLA-P'nase	3-283 μM	3 μM	3
Penicillinase	Single layer and bilayer PPy-P'nase	7.5-146 μM	0.3 μM	4
Penicillinase	Hybrid nanowire/nanoparticle array	20-310 μM	10.5 μM	5
Penicillinase	Penicillinase modified TMV nanorods	100 μM-20 mM	100 μM	6
Penicillinase	Dendrimer/carbon nanotube	5 μM-25 mM	5 μM	7
Penicillinase	PAH/penicillinase EIS sensor	20 μM-10 mM	20 μM	8
Penicillinase	2DPCCH colorimetric sensor	1 μM - 6 mM	1 μM	This work

References

1 F. A. Scholl, P. V. Morais, R. C. Gabriel, M. J. Schöning, J. R. Siqueira, L. Caseli, *ACS Appl. Mater. Interfaces*, 2017, **9**, 31054-31066.

2 A. Poghossian, M. Jablonski, C. Koch, T. S. Bronder, D. Rolka, C. Wege, M. J. Schöning, *Biosens. Bioelectron*., 2018, **110**, 168-174.

3 F. Ismail, S. B. Adeloju, *Electroanalysis*, 2015, **27**, 1523-1531.

4 F. Ismail, S. B. Adeloju, A. N. Moline, *Electroanalysis*, 2014, **26**, 2607-2618.

5 Z. Li, C. Liu, V. Sarpong, Z. Gu, *Biosens. Bioelectron*., 2019, **126**, 632-639.

6 C. Koch, A. Poghossian, M. J. Schöning, C. Wege, *Nanotheranostics*, 2018, **2**, 184-196.

7 J. R. Siqueira, M. H. Abouzar, A. Poghossian, T. S. Bronder, D. Rolka, C. Wege, M. J. Schöning, *Biosens. Bioelectron*., 2009, **25**, 497-501.

8 M. H. Abouzar, A. Poghossian, J. R. Siqueira, O. N. Oliveira, W. Moritz, M. J. Schoning, *Phys. Status Solid A*, 2010, **207**, 884-890.