

## **A phenylboronic acid-based smart photonic crystal hydrogel sensor for colorimetric detection of glucose**

Jingya Wen,<sup>a#</sup> Xi Wang,<sup>a#</sup> Hairong Yu,<sup>ab</sup> Xingbin Lv,<sup>ab</sup> Ting Liang<sup>\*ab</sup> and Changjing Cheng<sup>\*ab</sup>

<sup>a</sup> *College of Chemistry and Environment, Southwest Minzu University, Chengdu, Sichuan 610200, China*

<sup>b</sup> *Key Laboratory of Fundamental Chemistry of the State Ethnic Commission, College of Chemistry and Environment, Southwest Minzu University, Chengdu, Sichuan 610200, China*

\* Corresponding authors.

*Email addresses:* chengcj@swun.edu.cn (C.-J. Cheng), liangting@swun.edu.cn (T. Liang).

# Those authors contributed equally to this work.

ORCID identifiers:

Jingya Wen: 0000-0002-3749-9648

Xi Wang: 0000-0003-2354-2817

Hairong Yu: 0000-0003-4925-2666

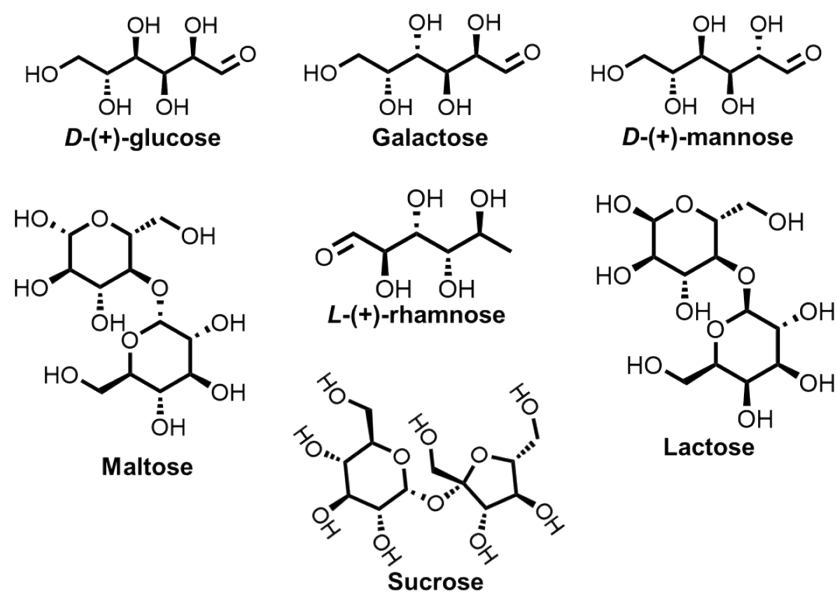
Xingbin Lv: 0009-0004-5582-221X

Ting Liang: 0000-0002-5824-9587

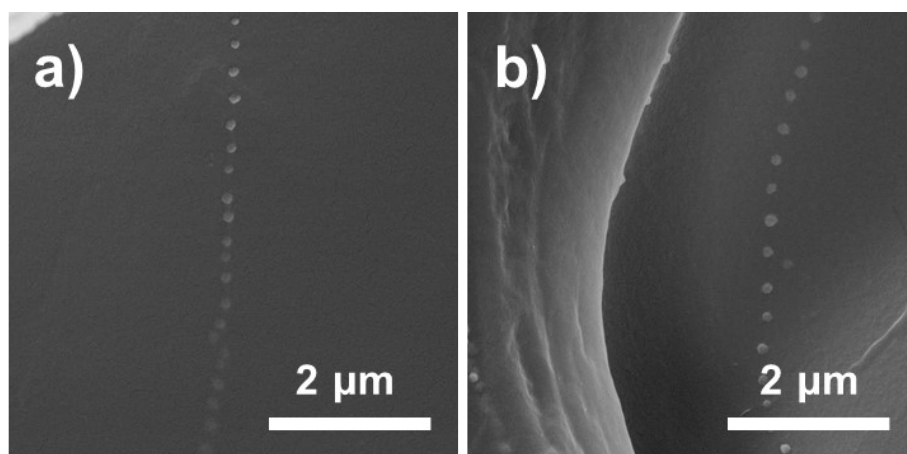
Changjing Cheng: 0000-0002-2065-7240

## Preparation of superparamagnetic Fe<sub>3</sub>O<sub>4</sub> nanoparticles

The superparamagnetic Fe<sub>3</sub>O<sub>4</sub> nanoparticles with a hydrodynamic diameter ( $d_h$ ) of ~127 nm was synthesized according to our recent work.<sup>1,2</sup> Briefly, 2.5 g of PSSMA was dissolved in 40 mL of EG followed by addition of 0.497 g of ferric chloride hexahydrate (FeCl<sub>3</sub>·6H<sub>2</sub>O) and vigorous stirring for 20 min. Then, 3.0 g of sodium acetate trihydrate (NaAc·3H<sub>2</sub>O) was added, and the mixture was stirred for another 30 min to form a brownish-red solution. The solution was transferred into a Teflon-lined stainless-steel autoclave (100 mL) and reacted for 10 h at 200 °C. After natural cooling to room temperature, the black product was collected with a magnet and rinsed with water thrice by ultrasonication, and then dispersed in 20 mL of water for the subsequent use.



**Fig. S1.** Chemical structures of various sugars.



**Fig. S2.** SEM images of the PNAPB PCH with fixed  $\text{Fe}_3\text{O}_4$  particle chains before (a) and after (b) responding to glucose.

### Notes and references

1. L. Pan, Z. Peng, H. Yu, T. Liang and C. Cheng, *New J. Chem.*, 2021, **45**, 16511–16519.
2. J. Wen, H. Yu, T. Liang, X. Lv and C. Cheng, *New J. Chem.*, 2023, **47**, 10236–10244.