

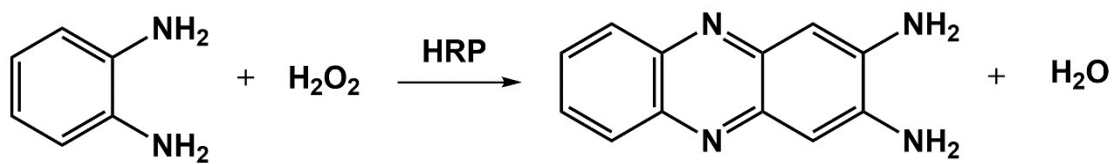
**A silicon nanoparticles-based nanoprobe for fluorescence ratiometric
and visual detection of glucose**

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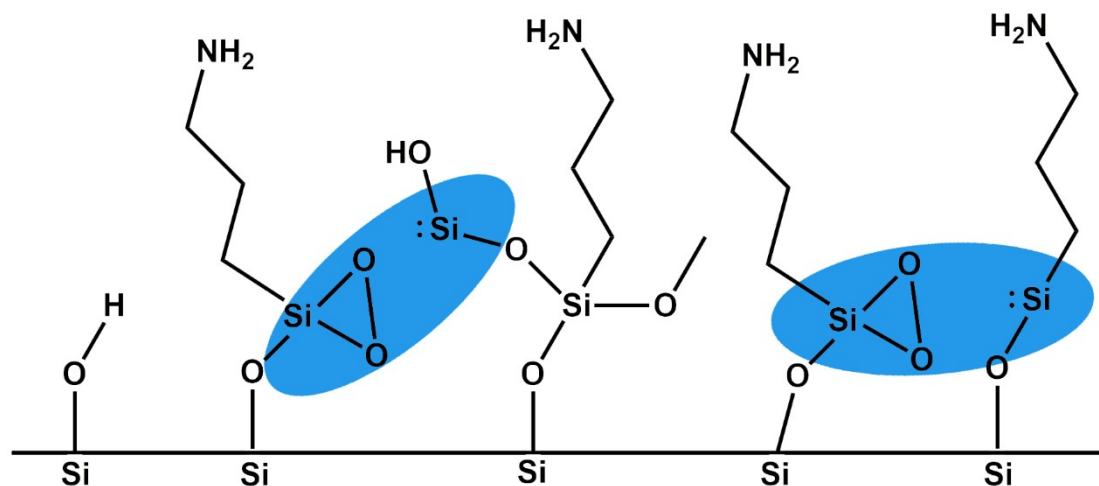
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Scheme S1 The oxidized route of OPD for 2,3-diaminophenazine (oxOPD) with H_2O_2 and HRP.



Scheme S2 Defect pairs generation on the surface of SiNPs (Modified by Ref. [1])

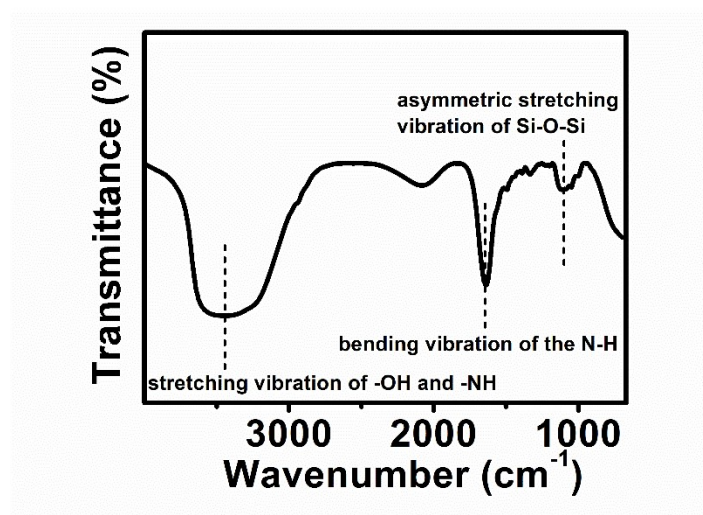


Fig. S1 FTIR spectrum of the SiNPs.

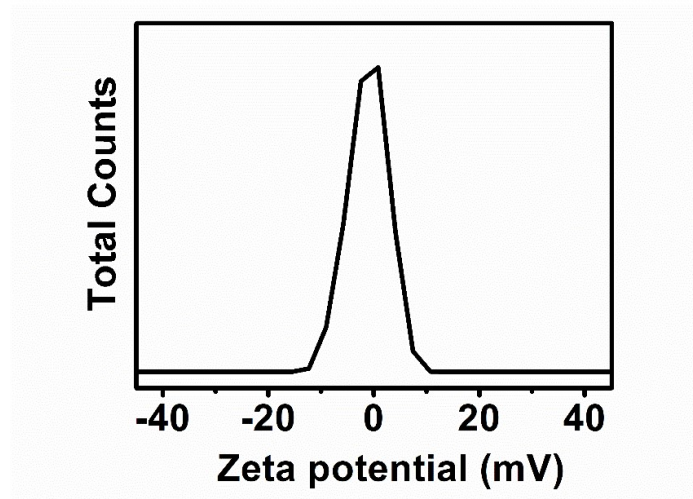


Fig. S2 Zeta potential of SiNPs dispersed in water.

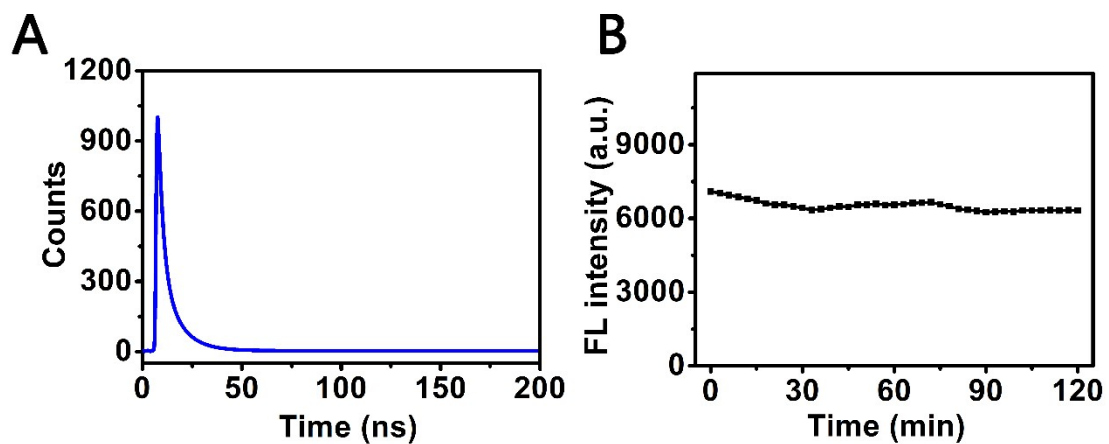


Fig. S3 (A) Fluorescence lifetime decay curves of SiNPs. (B) The fluorescence intensity of SiNPs under excitation of 355 nm with prolonged time.

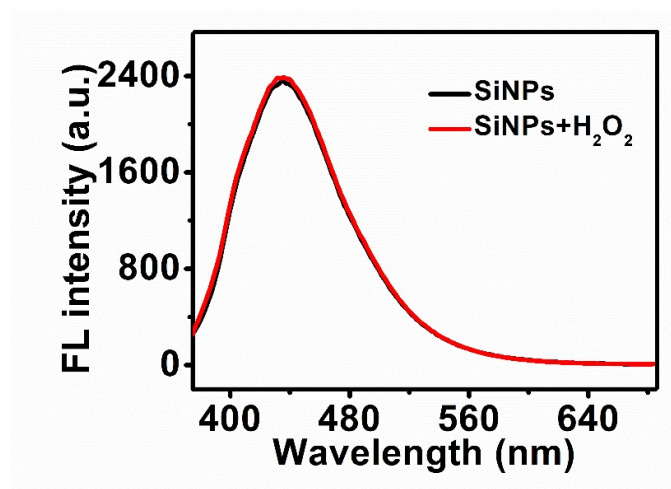


Fig. S4 The fluorescence spectra of SiNPs and SiNPs with H_2O_2 .

Table S1. Comparison of reported fluorescence methods for glucose detection

Detection methods	Detection limit (μM)	Signal output	References
CuNPs	50	turn off	[2]
CdTe/CdS quantum dots- GOx	100	turn off	[3]
Boron-doped graphene quantum dots (BGQDs)	30	turn on	[4]
CuNCs in alginate	32	turn on	[5]
AgNC-GOx/Ag ⁺ -FP	50	turn on	[6]
PNAS-APBA-ARS@Ova-AuNCs	100	ratiometric	[7]
SiNPs/OPD/HRP/GOx	6.8	ratiometric	this work

References

- [1] J. Yoo, S. Han, W. Park, T. Lee, Y. Park, H. Chang, S. K. Hahn and W. Kwon, *ACS Appl. Mater. Inter.*, 2018, **10**, 44247-44256.
- [2] Z. Mao, Z. Qing, T. Qing, F. Xu, L. Wen, X. He, D. He, H. Shi and K. Wang, *Anal Chem*, 2015, **87**, 7454-7460.
- [3] L. Ding, B. Zhang, C. Xu, J. Huang and Z. Xia, *Anal. Methods*, 2016, **8**, 2967-2970.
- [4] L. Zhang, Z. Y. Zhang, R. P. Liang, Y. H. Li and J. D. Qiu, *Anal Chem*, 2014, **86**, 4423-4430.
- [5] S. Gou, Y. E. Shi, P. Li, H. Wang, T. Li, X. Zhuang, W. Li and Z. Wang, *ACS Appl. Mater. Inter.*, 2019, **11**, 6561-6567.
- [6] S. Jiang, Y. Zhang, Y. Yang, Y. Huang, G. Ma, Y. Luo, P. Huang and J. Lin, *ACS Appl. Mater. Inter.*, 2019, **11**, 10554-10558.
- [7] L. L. Wang, J. Qiao, H. H. Liu, J. Hao, L. Qi, X. P. Zhou, D. Li, Z. X. Nie and L. Q. Mao, *Anal Chem*, 2014, **86**, 9758-9764.