

Supplementary Information

Glucose oxidase and Au nanoclusters co-encapsulated metal-organic frameworks using as sensitive colorimetric sensor for glucose based on cascade reaction

Jingtian Chi,^a Manli Guo,^a Chi Zhang,^b Yuanhong Zhang,^b Shiyun Ai,^b Juying Hou,^{*,b}

Peng Wu,^{*,a} Xiangyang Li^{*,a}

^aCollege of Food Science and Engineering, Shandong Agricultural University, Taian, Shandong 271018, P.R. China

^bCollege of Chemistry and Material Science, Shandong Agricultural University, Taian, Shandong 271018, P.R. China

* Corresponding authors:

E-mail: juyinghou@sdau.edu.cn (Juying Hou); wupengguai@163.com (Peng Wu);

xiangyang_l@163.com (Xiangyang Li).

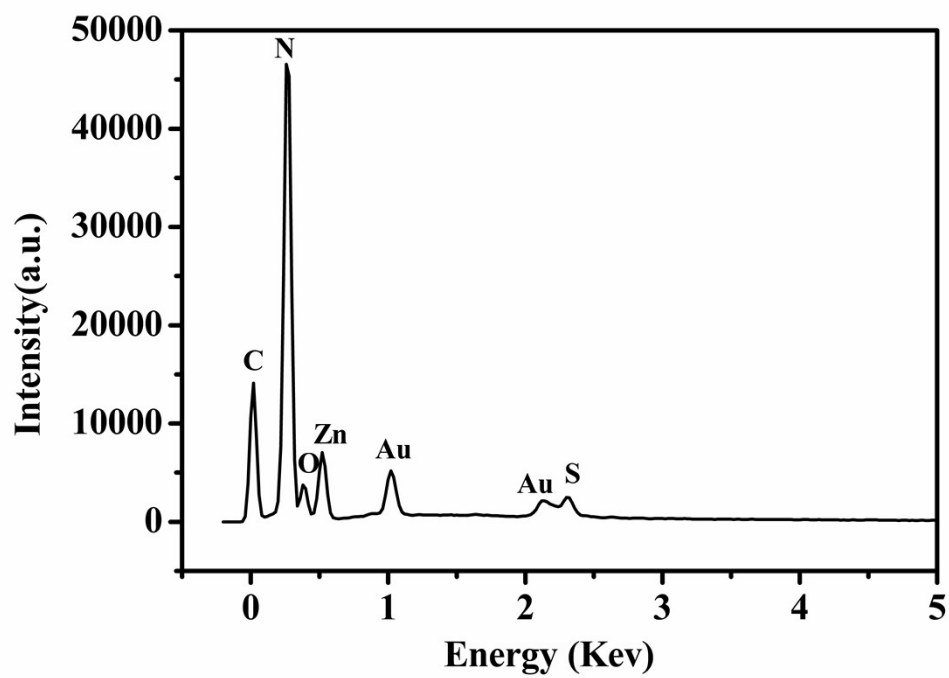


Fig.S1. EDS analysis of GOx&AuNCs@ZIF-8.

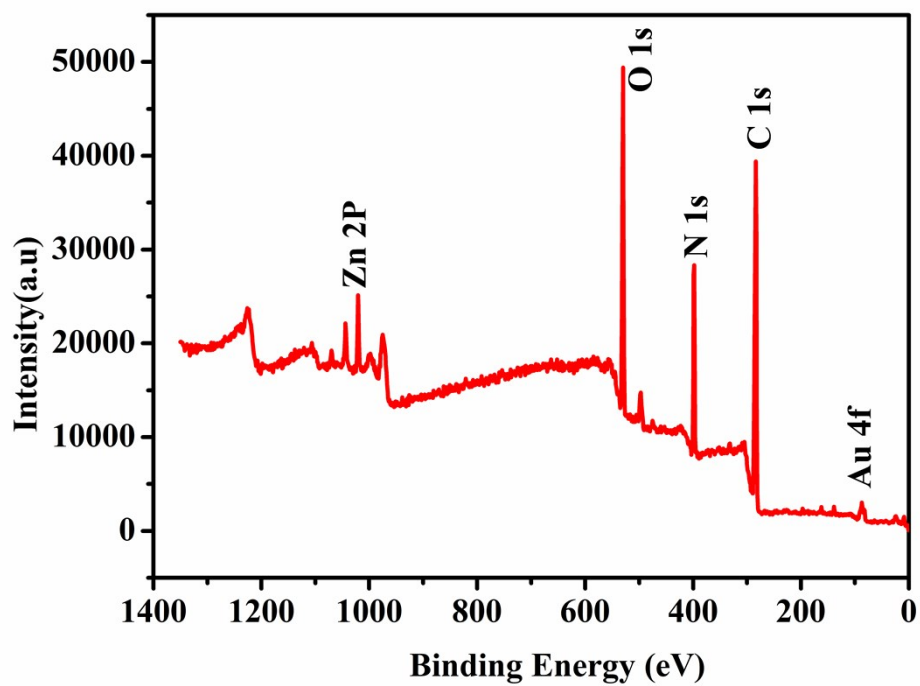


Fig.S2. XPS patterns of GOx&AuNCs@ZIF-8 composite.

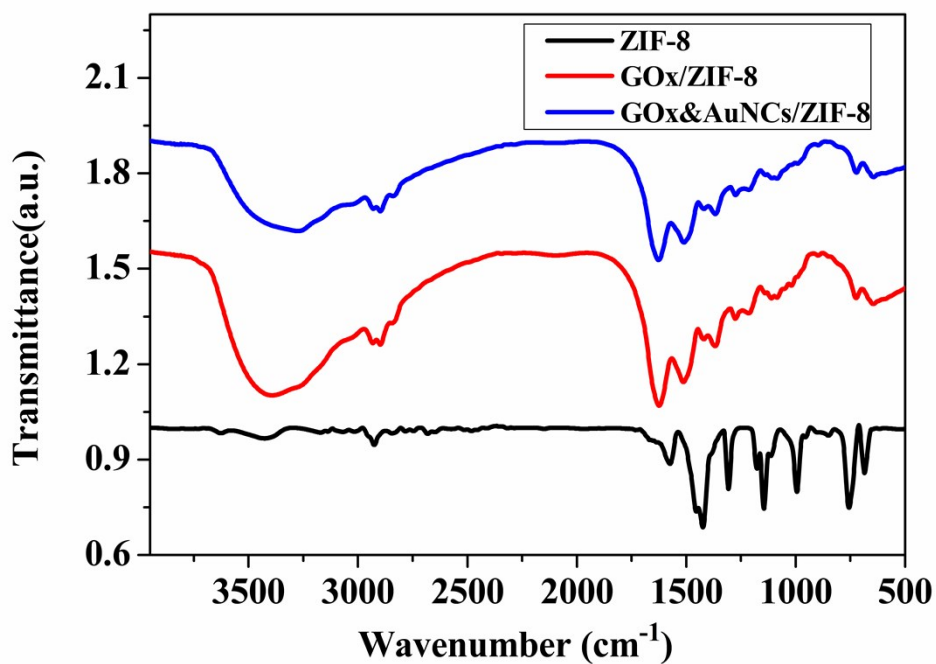


Fig.S3. FT-IR spectrum of ZIF-8, GOx@ZIF-8, and GOx&AuNCs@ZIF-8.

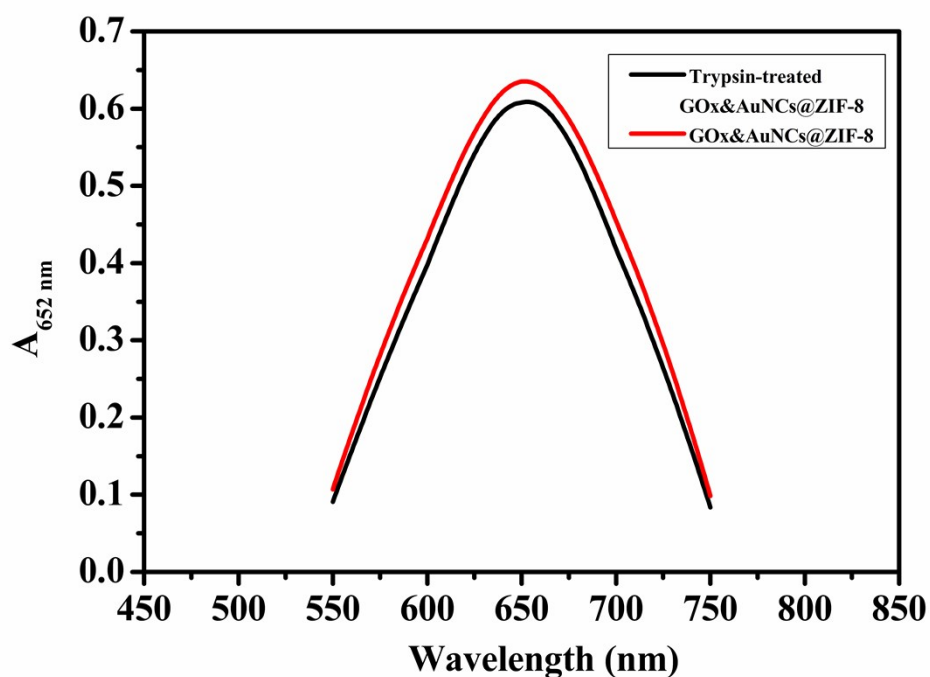


Fig.S4. UV-vis absorption spectrum of oxTMB generated by GOx&AuNCs@ZIF-8 composite before and after incubation with trypsin.

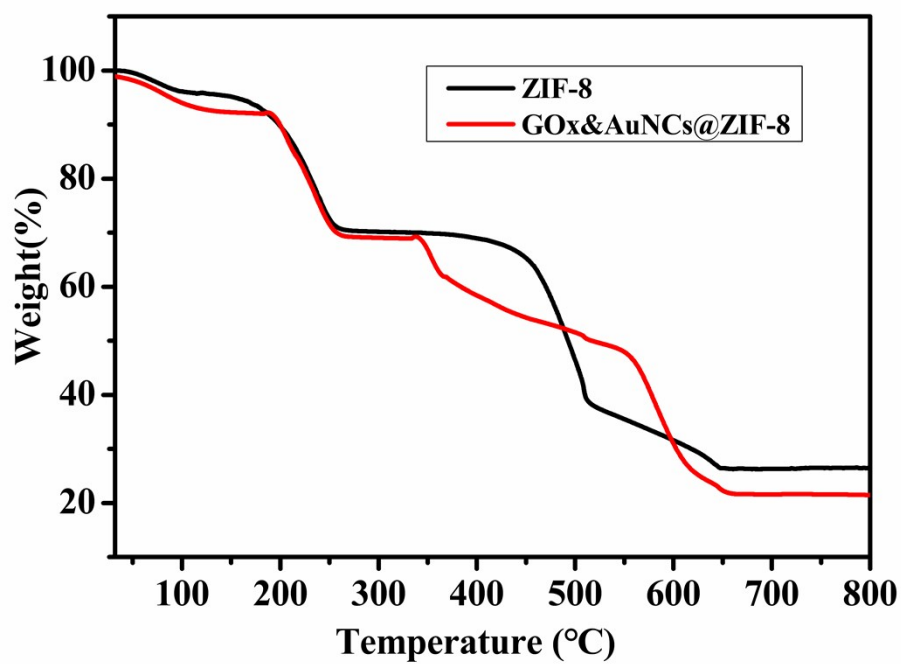


Fig.S5. TGA curves of GOx&AuNCs@ZIF-8 composite and ZIF-8 in air.

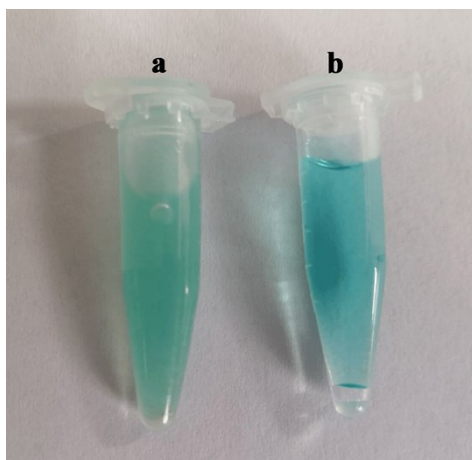


Fig.S6. Corresponding image of GOx&AuNCs@ZIF-8/glucoase/TMB after incubation in the pH 3.0 acetate buffer about 10 min (a) and about 30 min (b).

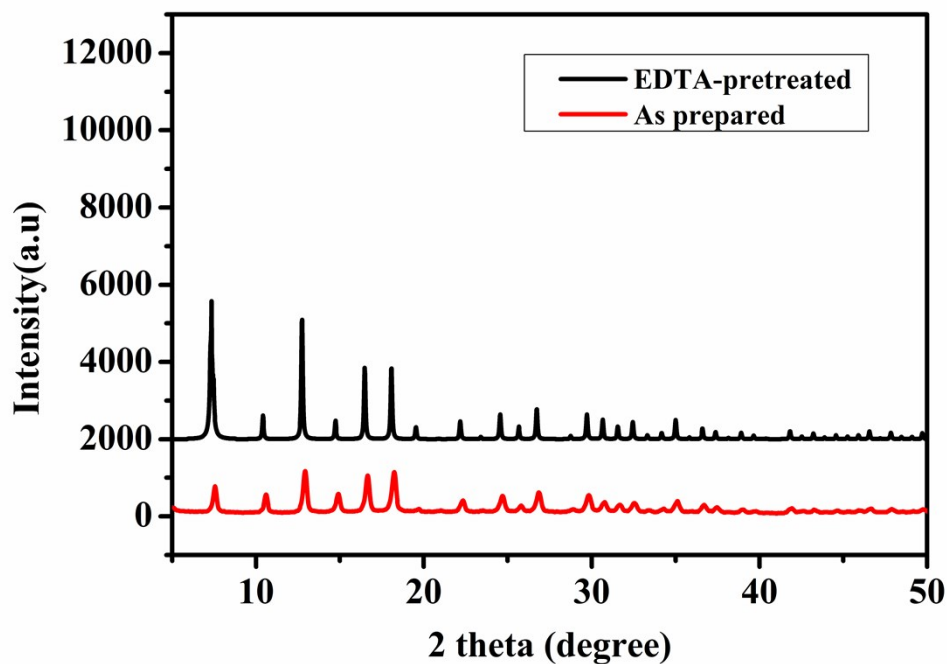


Fig.S7. XRD patterns of GOx&AuNCs@ZIF-8 composites with and without EDTA-pretreatment.

Table S1. Comparison of the apparent maximum reaction rate (V_{max}) and Michaelis constant (K_m) data between GOx&AuNCs@ZIF-8 and GOx/AuNCs.

Catalyst	Substance	K_m (mM)	V_{max} (10^{-8} M s $^{-1}$)
GOx&AuNCs@ZIF-8	TMB	0.4	2
GOx/AuNCs	TMB	0.6	2.4

Table S2. The comparison of linear ranges and LOD for glucose detection of this work with other reported sensors.

Catalyst	Linear ranges (μ M)	LOD (μ M)	Reference
CeO $_2$ /TiO $_2$ NTs	10-500	6.1	1
CoAl-ELDH	50-500	50	2
NiFe-LDHNS	50-2000	23	3
Co $_3$ O $_4$ @CeO $_2$	1-75	1.9	4

GOx&AuNCs@ZIF-8	1-25	0.8	This work
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Table S3. Determination of glucose in real samples using GOx&AuNCs@ZIF-8.

Added (μM)	Serum samples Found (μM)	RSD (%)	Recovery (%)
5	4.65	2.53	93
10	9.14	2.83	91.4
20	20.12	3.06	100.6

References

1. H. Zhao, Y. Dong, P. Jiang, G. Wang and J. Zhang, *ACS Appl. Mater. Inter.*, 2015, **7**, 6451-6461.
2. W. Yang, J. Li, M. Liu, D. H. L. Ng, Y. Liu, X. Sun and J. Yang, *Appl. Clay Sci.*, 2019, **181**, 105238.
3. T. Zhan, J. Kang, X. Li, L. Pan, G. Li and W. Hou, *Sensor. Actuat. B: Chem.*, 2018, **255**, 2635-2642.
4. D. Jampaiah, T. Srinivasa Reddy, V. E. Coyle, A. Nafady and S. K. Bhargava, *J. Mater. Chem. B*, 2017, **5**, 720-730.