Electronic Supplementary Information

A Label-Free Aptasensor for Highly Efficient ATP Detection by Using Exonuclease I and Oligonucleotide-templated Fluorescent Copper Nanoparticles

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Fig. S1. Typical TEM image of oligonucleotide-templated copper nanoparticles.

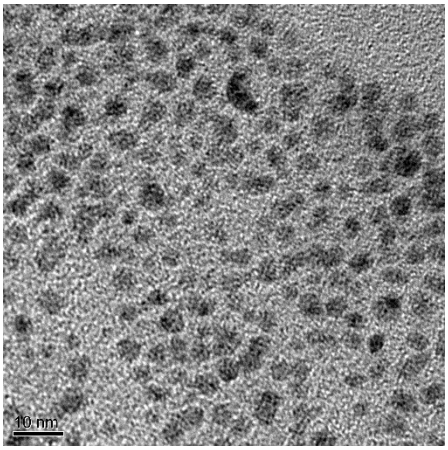

Table S1 Comparision of different methods for ATP determination.

Method	**Range**	**LOD**	**Reference**
MB[1]-based assay	0.8 –80 μM	0.5 μM	[1]
GO[2]-based molecular beacon assay	5 – 2500 μM	2 μM	[2]
AuNPs[3]-based aptamer	4.4 – 132.7 μM	0.6 μM	[3]
UCNPs[4]-based biosensor	0.1 – 0.75 mM	20 μM	[4]
Sandwich-type FRET[5] assay	2 –16 μM	1.70 μM	[5]
]Aptamer–target recognition based aptasensor	62.5 – 2500 μM	1.45 μM	[6]
AIE[6]-active probe	0 – 1 mM	24 μM	[7]
Microfluidic paper analysis	0.5 – 10 μM	1 μM	[8]
GOx signaling trigger	10 – 100 μM	10 μM	[9]
Fe^{3+}- fluorescence carbon dots	0.5 – 50 μM	0.48 μM	[10]
Zn^{2+}-Cysteine capped CdTe QDs[7]	5 – 50 μM	2.07 μM	[11]
Aptamer fluorescence anisotropy sensors	1 – 200 μM	1 μM	[12]
Oligonucleotide-based CuNPs system	1 – 80 μM	0.5 μM	This work

[1]MB, Molecular Beacon
[2]GO, Graphene Oxide
[3]AuNPs, Gold nanoparticles
[4]UCNPs, Upconversion nanpparticles
[5]FRET, Fluorescence resonance energy transfer
[6]AIE, Aggregation-induced emission
[7]QDs, Quantum dots

Reference

[1] S.J. Zhen, L.Q. Chen, S.J. Xiao, Y.F. Li, P.P. Hu, L. Zhan, L. Peng, E.Q. Song, C.Z. Huang, Anal. Chem. 82 (2010) 8432-8437.

[2] Y. He, Z.-G. Wang, H.-W. Tang, D.-W. Pang, Biosens. Bioelectron. 29 (2011) 76-81.

[3] J. Wang, L. Wang, X. Liu, Z. Liang, S. Song, W. Li, G. Li, C. Fan, Adv. Mater. 19 (2007) 3943-3946.

[4] K. Song, X. Kong, X. Liu, Y. Zhang, Q. Zeng, L. Tu, Z. Shi, H. Zhang, Chem. Commun. 48 (2012) 1156-1158.

[5] X. He, Z. Li, X. Jia, K. Wang, J. Yin, Talanta, 111 (2013) 105-110.

[6] Y. Tan, X. Zhang, Y. Xie, R. Zhao, C. Tan, Y. Jiang, Analyst, 137 (2012) 2309-2312.

[7] K. Ma, H. Wang, H. Li, S. Wang, X. Li, B. Xu, W. Tian, Sens. Actuators. B. Chem. 230 (2016) 556-558.

[8] S.-Q. Jin, S.-M. Guo, P. Zuo, B.-C. Ye, Biosens. Bioelectron. 63 (2015) 379-383.

[9] S. Sitaula, S.D. Branch, M.F. Ali, Chem. Commun. 48 (2012) 9284-9286.

[10] Z. Zhan, J. Cai, Q. Wang, Y. Su, L. Zhang, Y. Lv, Luminescence, 31 (2016) 626-632.

[11] F. Shi, Y. Li, Z. Lin, D. Ma, X. Su, Sens. Actuators. B. Chem. 220 (2015) 433-440.

[12] Q. Zhao, Q. Lv, H. Wang, Biosens. Bioelectron. 70 (2015) 188-193.