Mn-doping-induced hierarchical petal growth of flower-like 3D MOF assembled with black phosphorous nanosheets as an electrochemical aptasensor of human stress-induced phosphoprotein 1

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Table S1

Detection performances from previous methods and this developed aptasensor for the determination of STIP1.

Method	Detection range /ng mL^{-1}	LOD /ng mL^{-1}	Ref.
Raman light scattering sensor	1~40	Not provided	[1]
Fluorescent sensor	1~75	Not provided	[1]
Impedimetric immunosensor	1×10^{-2}~1×10^{3}	1×10^{-2}	[2]
Fluorescence switch of DNA polymerase activity	1×10^{-2}~5×10^{2}	3.4×10^{-3}	[3]
Aptamer-BPNSs/Mn-MOF/GCE electrochemical aptamer biosensor	2×10^{-3}~1×10^{4}	1×10^{-3}	This work

References

[1] F. Chen, Y. Liu, C. Chen, H. Gong, C. Cai and X. Chen, Respective and simultaneous detection tumor markers CA125 and STIP1 using aptamer-based fluorescent and RLS sensors, *Sens. Actuators B-Chem.*, 2017, **245**, 470–476.

[2] J. K. Lee, S. H. Cho, J. H. Lee, H. Y. Ryu, J. G. Park, S. H. Lim, B. D. Oh, C. W. Lee, W. Huang, A. Busnaina and H. Y. Lee, Wafer-scale nanowell array patterning based electrochemical impedimetric immunosensor, *J. Biotechnol.*, 2013, **168**, 584–588.

[3] Y. Huang, H. Li, L. Wang, X. Mao and G. Li, Highly sensitive protein detection based on smart hybrid nanocomposite-controlled switch of DNA polymerase activity, *ACS Appl. Mater. Interfaces*, 2016, **8**, 28202−28207.

Table S2

Detection of STIP1 in practical human serum samples by using this developed aptasensor.

[a] Sample	Spiked /ng mL^{-1}	[b] Detected /ng mL^{-1}	[c] RSD /%	Recovery /%
1	0	Not found	–	–
2	2×10^{-1}	$(1.93 \pm 0.08) \times 10^{-1}$	4.14	96.50
3	2×10^{0}	$(2.07 \pm 0.09) \times 10^{0}$	4.35	103.50
4	2×10^{1}	$(2.09 \pm 0.05) \times 10^{1}$	2.39	104.50
5	2×10^{2}	$(1.98 \pm 0.07) \times 10^{2}$	3.53	99.00
6	2×10^{3}	$(2.05 \pm 0.06) \times 10^{3}$	2.93	102.50

[a] Samples were prepared by 10-fold diluting practical human serum samples with PBS (10 mM, pH 7.4).

[b] All detected results were expressed as the average of six repetitive determinations ± standard deviation (SD).

[c] Relative standard deviation (RSD) was defined as (SD/average) × 100%.

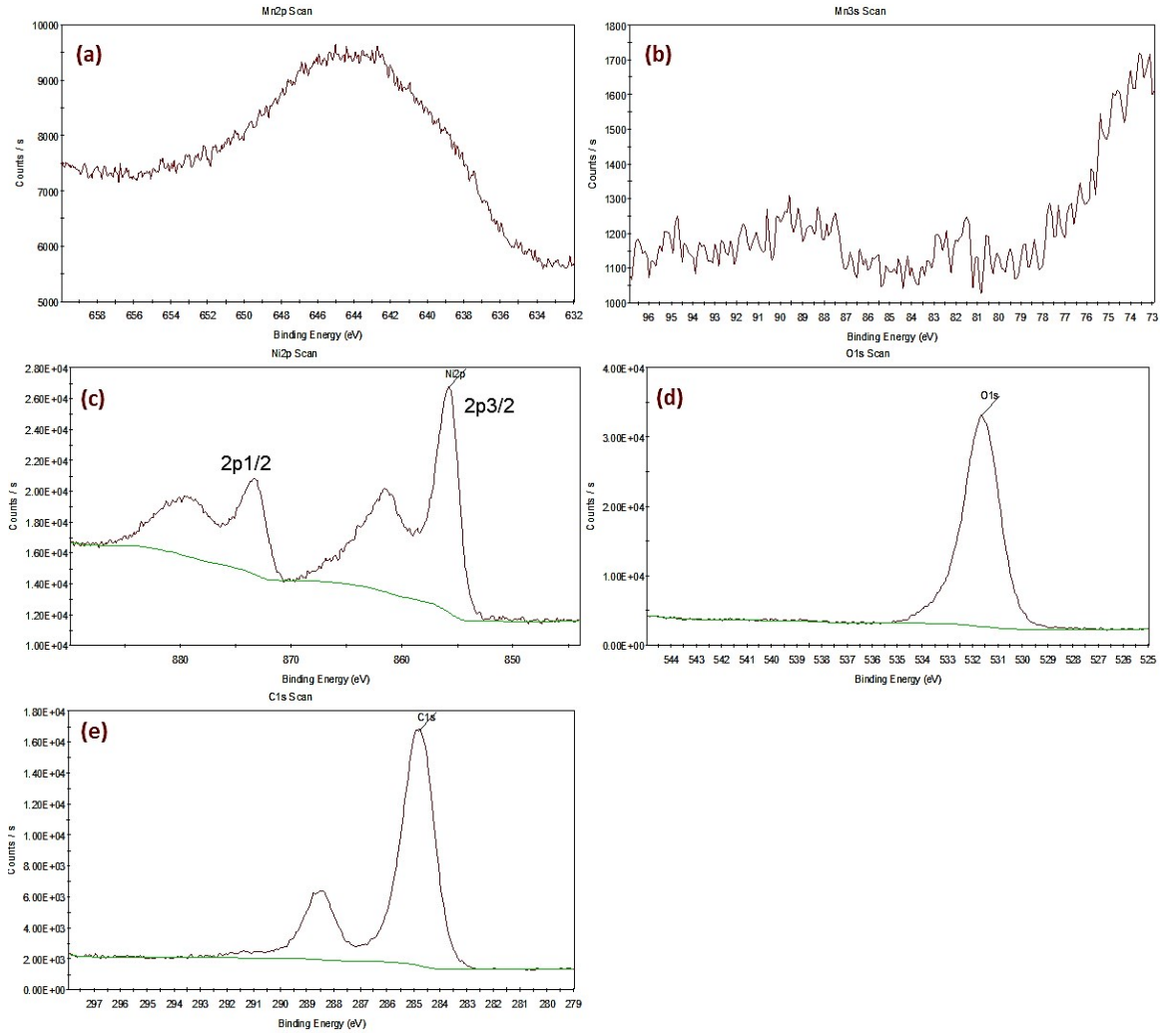

Fig. S1. The high-resolution XPS spectra of (a) Mn2p, (b) Mn3s, (c) Ni2p, (d) O1s, and (e) C1s.

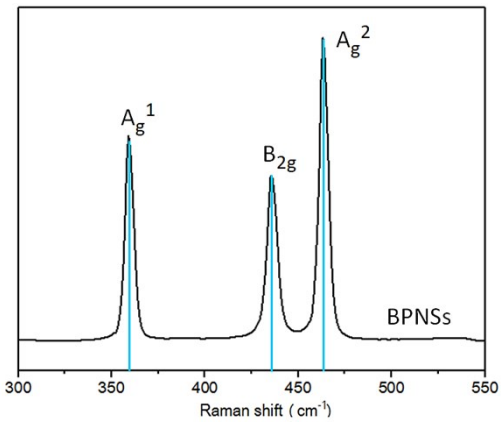

Fig. S2. Raman spectra of the as-prepared BPNSs.