Enzyme-guided crystal growing surface-enhanced Raman scattering active Core shell for bisphenol A detection

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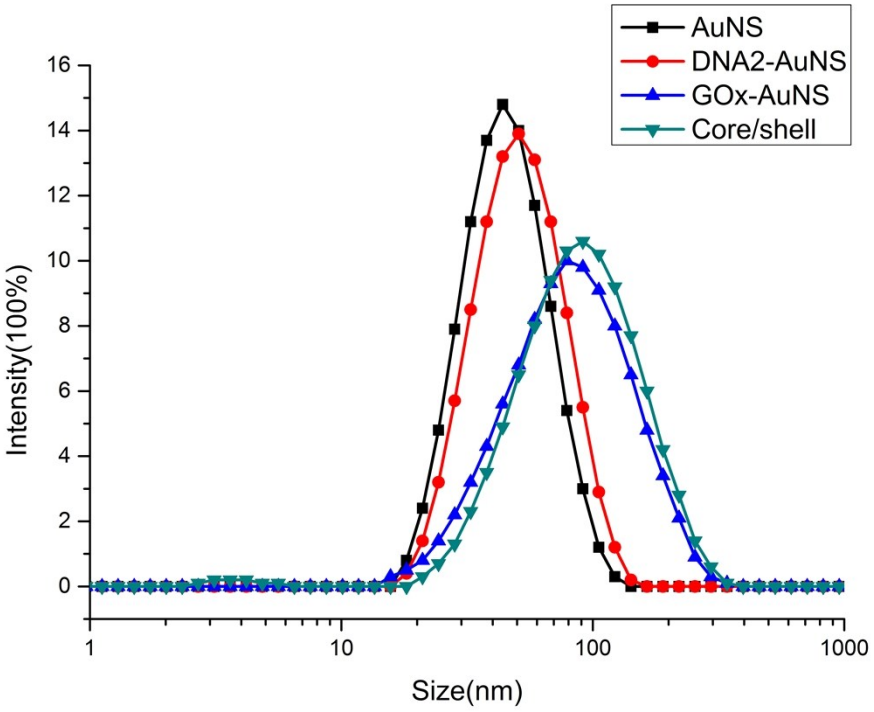

Fig.S1 The dynamic light scattering (DLS) of AuNS at different structures.

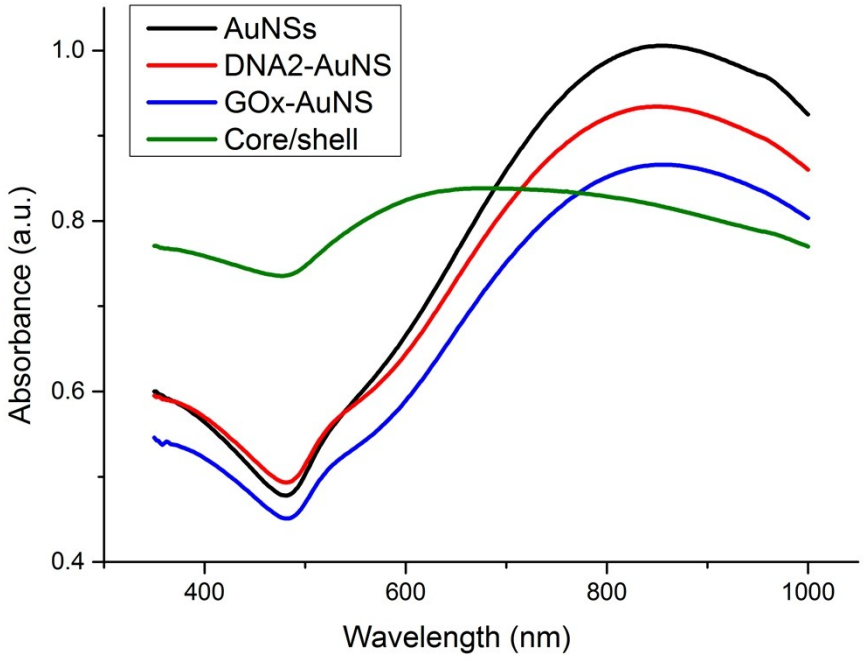

Fig.S2 The Vis-NIR spectra of AuNS, DNA2-AuNS, GOx-AuNS and Core/shell.

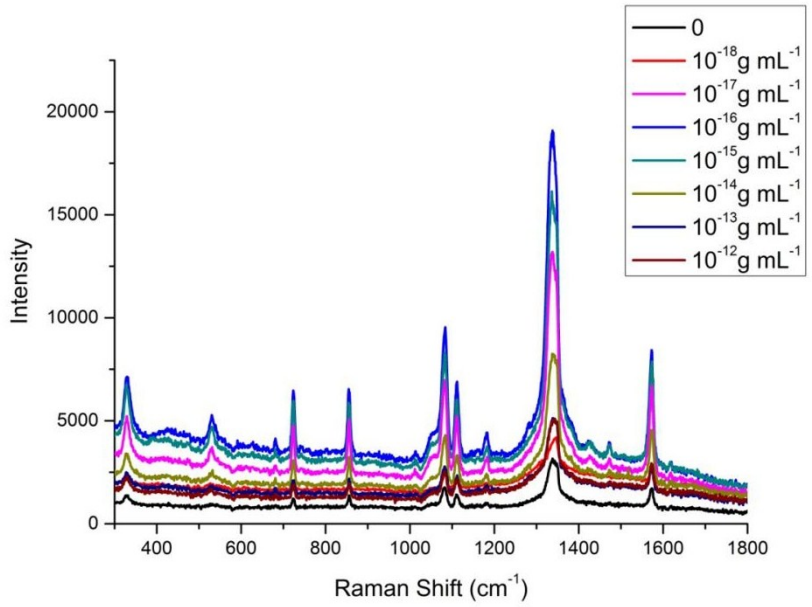

Fig.S3 The SERS intensity of biosensors with the different concentration of GOx.

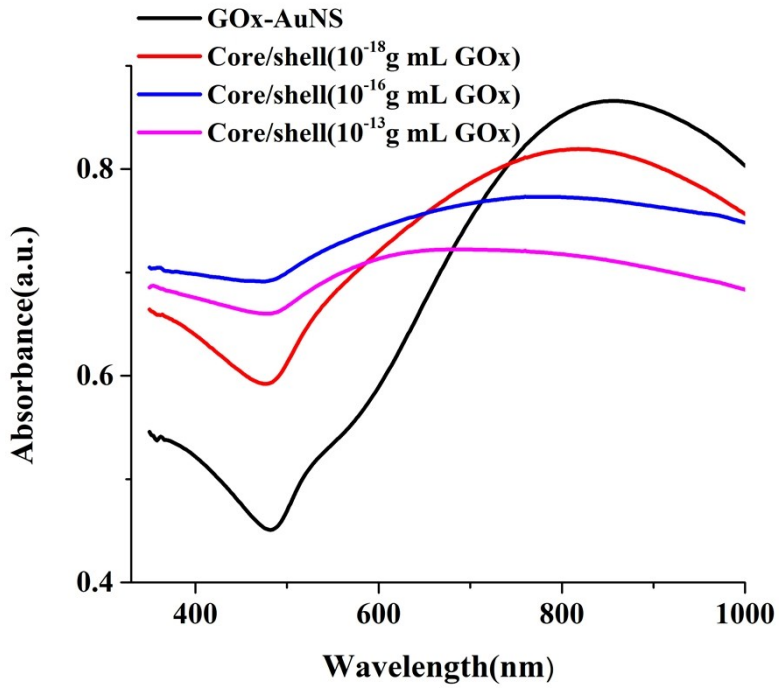

Fig.S4 The Vis-NIR spectra after addition of different concentrations of GOx.

Comments: The Vis-NIR spectra (**Fig. S4**) and TEM images (**Fig. S5**) of the core/shell nanostructures with various concentrations of GOx was characterized. As increasing the concentration of GOx in the range from 0 to 10^{-13} g mL^{-1}, we could observed the surface plasmon resonance band could display gradually blue shift from ~860 nm to ~680 nm along with gradually thickens of the silver shell. As the superimposing effect of the charge transfer and the enhancement of electromagnetic field, the SERS signals could be gradually increased with increasing the concentration of GOx.

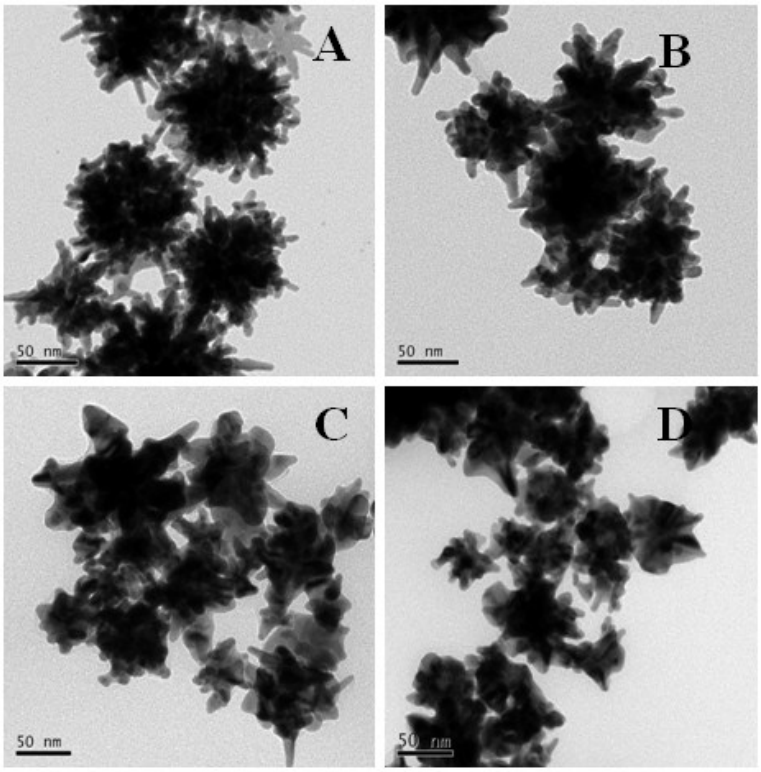

Fig.S5 TEM images of Core/shell structure in the presence of different concentrations of GOx: 0 g mL^{-1} (A), 10^{-19} g mL^{-1} (B), 10^{-16} g mL^{-1} (C), 10^{-13} g mL^{-1} (D).

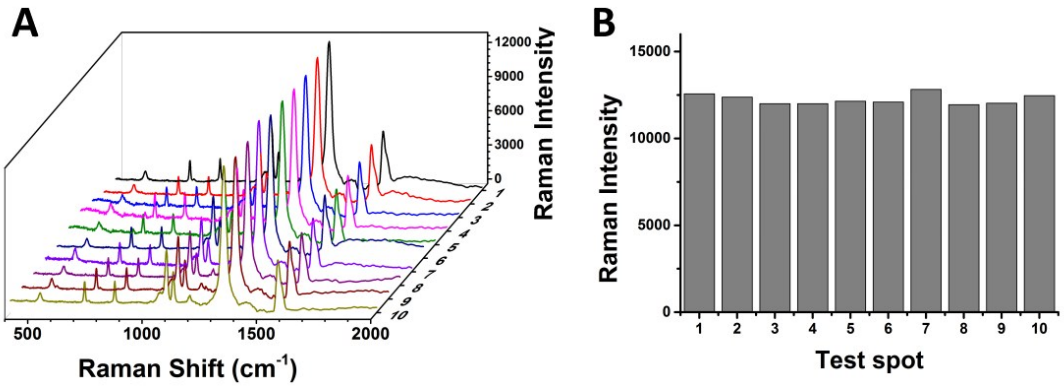

Fig.S6 (A) Reproducibility of the SERS spectra of 4-NTP collected at 10 randomly selected spots on the substrate (10^{-15} g/mL BPA). (B) Signal intensity of the 1339 cm^{-1} line from 4-NTP collected at 10 randomly selected spots on the substrate (10^{-15} g/mL BPA). SERS detection parameters: $\lambda_{excitation}$ = 633 nm, accumulation time = 15 s, laser power = 8 mW

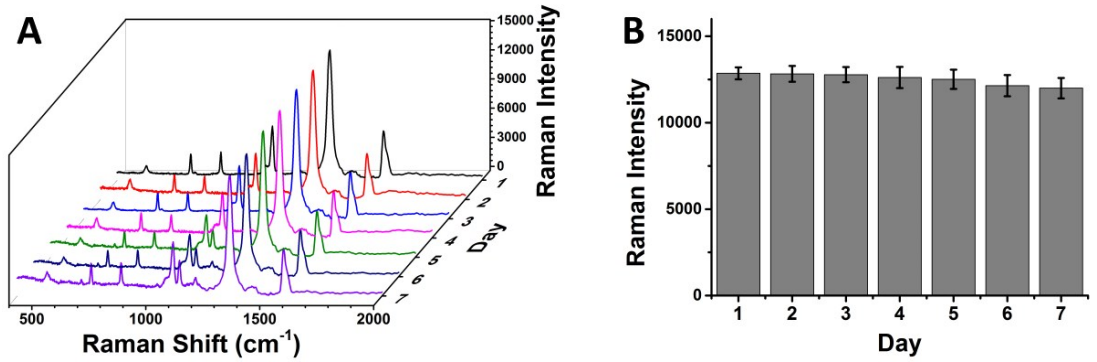

Fig.S7 Stability of the SERS spectra of 4-MBA within 7 days (A) (10^{-15} g/mL BPA). Signal intensity of the 1339 cm^{-1} line from 4-NTP within 7 days (B). SERS detection parameters: $\lambda_{excitation}$ = 633 nm, accumulation time = 15 s, laser power = 8 mW.

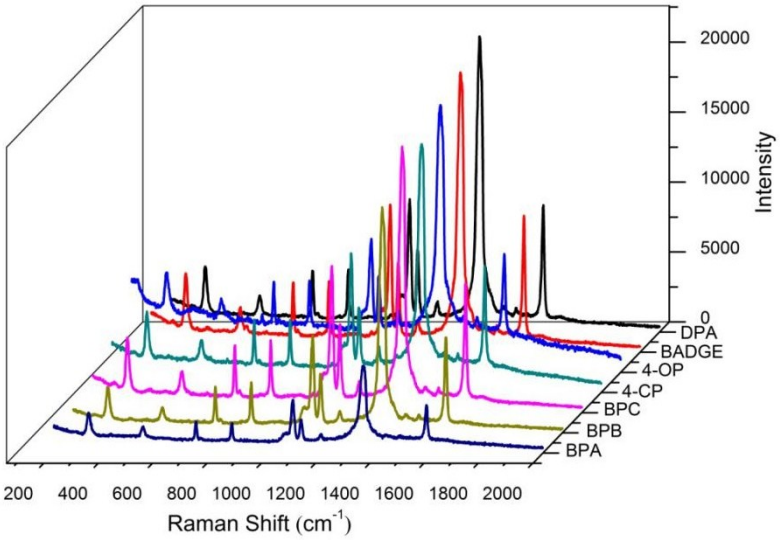

Fig.S8 SERS spectrum of different BPA analogs at the same concentration.

Table S1 Comparison of this work with other methods based on aptamer for detecting BPA

Detection method	Limit of detection	Reference
GC-MS	62 mg kg^{-1}	*Food chemistry, 2017, 232, 501-507*
Fluorescence	6.62×10^{-9} g mL^{-1}	*Biosensors & Bioelectronics*, 2017, 92, 147-153
Fluorescence	9.82×10^{-13} g mL^{-1}	*Chemical Communications*, 2013, 49, 5960-5962
Plasmonic chiral aptasensor	7.99×10^{-12} g mL^{-1}	*ACS applied materials & interfaces*, 2014, 6, 364-369
SERS	2.28×10^{-15} g mL^{-1}	*Biosensors & Bioelectronics*, 2015, 64, 560-565
SERS	5.00×10^{-17} g mL^{-1}	This work

Table S2 Analytical parameters of the proposed method for determining BPA in tap water

Sample	**Linear range (g mL^{-1})**	**Linearity (R^2)**	**LOD[a] (g mL^{-1})**	**RSD[b] (%)**	**RSD[c] (%)**
Tap water	10^{-16}-10^{-12}	0.9901	5×10^{-17}	3.3%	5.7%

[a]LOD for the present method,based on the signal being three times as large as the baseline noise (S/N=3). [b]intraday and n=5. [c]interday and n=5.