

Supporting Information

Chirality based sensor for bisphenol A detection

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Characterization of Dynamic Light Scattering

DLS measurements were performed using a Zetasizer Nano (Malvern Instruments, West-borough, MA) in backscatter configuration ($\theta=173^\circ$) at a laser wavelength of $\lambda_0=633$ nm. Measurement protocols used in this study are described elsewhere, and measurements were made over 2 min by collecting no less than 12 runs of submeasurements at a constant temperature of 25.0 °C. No additional purification step was used following the conjugation of Au NPs-Ab, Au NPs-Ag and dimer prior to DLS measurements¹.

Characterization by DLS showed that there was a dramatic change in asymmetric dimer size upon mixing the 10 nm and 20 nm Au NPs (Fig. S2). Assembly induced by molecular recognition between Au NP-Ab and Au NP-Ag led to an increase in hydrodynamic diameter from 37 nm and 50 nm to 78 nm. However, UV/Vis absorption spectra are not sensitive to the assembly of an asymmetric dimer (Fig. S3).

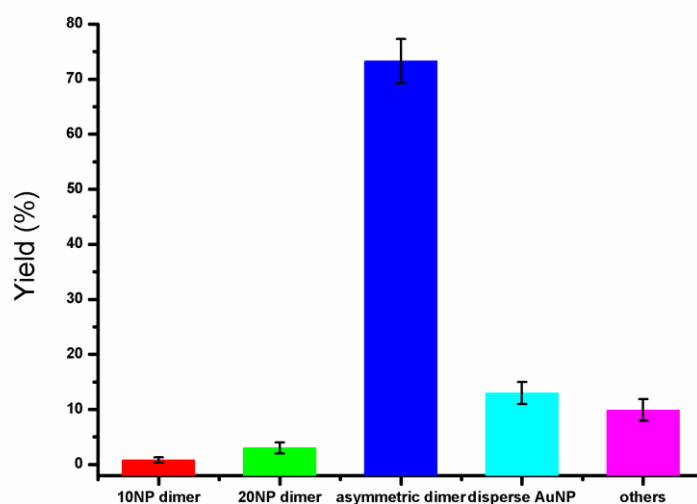


Figure S1. Statistical distribution of different types (10nm Au NP dimer, 20nm Au NP dimer, asymmetric dimer, disperse Au NP and others) in the sensor.

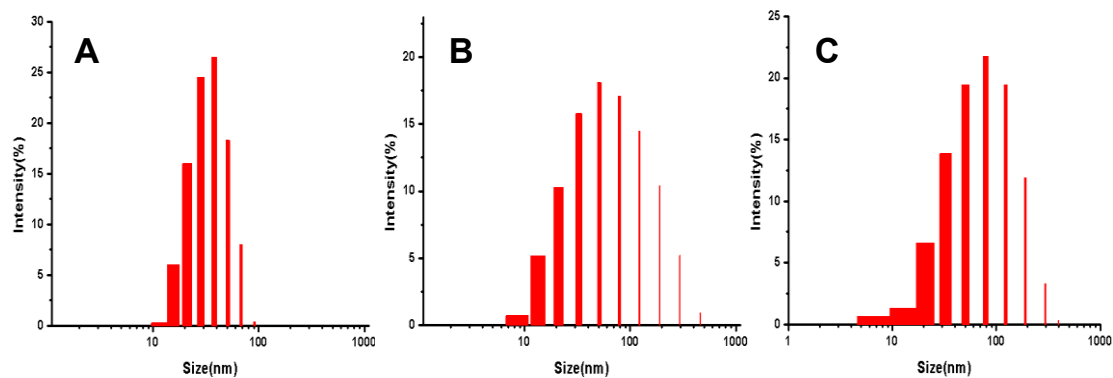


Figure S2. Hydrodynamic diameters of NPs at different states via dynamic light scattering (DLS). Mean average hydrodynamic diameters for (A) coating antigen modified 10nm Au NP and (B) antibody modified 20nm Au NP and (C) assemblies asymmetric dimer.

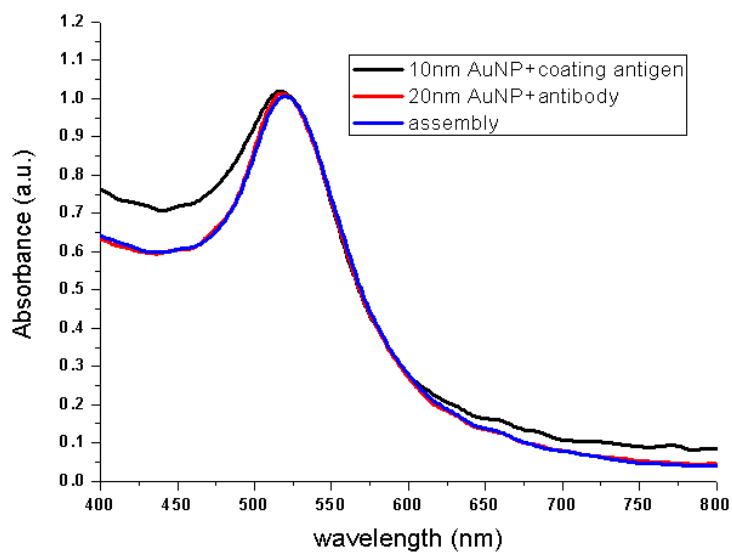


Figure S3. Normalized absorption spectra of 10nm Au NP-antigen, 20nm Au NP-antibody and dimers

Insignificant difference was found in the absorption spectra, a slight red shift was noticed when going from monomers to dimers. Similar red shifts have recently been reported for dimer.²

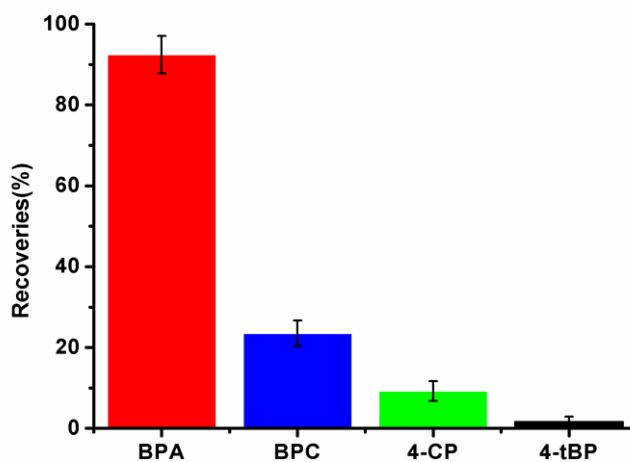


Figure S4. Recoveries of spiked BPA and its analogues in Milli-Q water following chirality sensor, spiked with 1 ng/mL BPA. Peaks orders of the compounds in chirality sensor analysis are: BPC, 4-CP, 4-tBP and BPA.

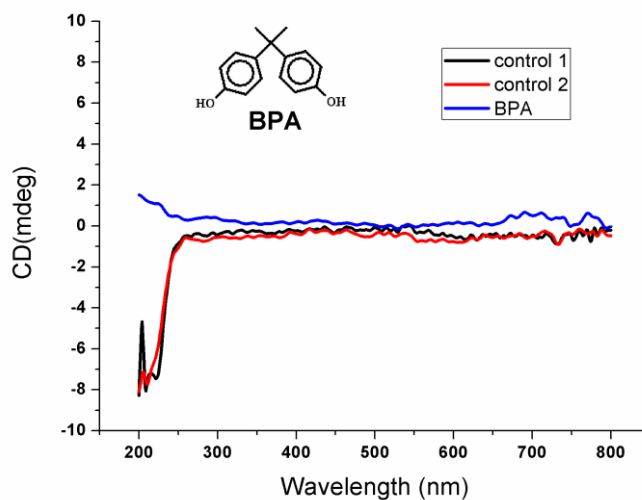


Figure S5. Different types of controls in the sensors. The black line (control 1) is mixture of 20nm Au NP-Ab and 10nm Au NP-BSA, the red line (control 2) is mixture of 20nm Au NP-BSA and 10nm Au NP-Ag, and the blue line is BPA (0.8 mg/mL).

1. D. H. Tsai, F. W. DelRio, A. M. Keene, K. M. Tyner, R. I. MacCuspie, T. J. Cho, M. R. Zachariah and V. A. Hackley, *Langmuir*, 2011, **27**, 2464-2477.
2. X. J. Wang, G. P. Li, T. Chen, M. X. Yang, Z. Zhang, T. Wu and H. Y. Chen, *Nano Lett*, 2008, **8**, 2643-2647.