Supplementary Material (ESI) for Chemical Communications

SUPPORTING INFORMATION

Sivler Nanoprobe for Sensitive and Selective Colorimetric Detection of Dopamine via Robust Ag-catechol Interaction

EXPERIMENTAL SECTION

Chemicals and Materials.

Silver nitrate ($AgNO_3$), sodium citrate dihydrate ($Na_3C_6H_5O_7$•2H2O), and sodium borohydride ($NaBH_4$) were purchased from Alfa Aesar. Dopamine hydrochloride, and 4-(2-hydroxyethyl) piperazine-1-ethanesulfonic acid (HEPES) were obtained from Sigma-Aldrich. All other reagents were of analytical reagent grade, and used as received. Nanopure water (18.2 MΩ; Millpore Co., USA) was used throughout the experiment.

Instrumentation. The UV-Vis absorption spectra and fluorescence spectra were recorded using a JASCO V-550 UV/Visible and a JASCO FP6500 spectrophotometer (JASCO International Co., LTD., Tokyo, Japan).

Assay procedure. Silver nanoparticles were synthesized by reduction of $AgNO_3$ by $NaBH_4$ in the presence of sodium citrate.[1] In a typical procedure, 100 μL AgNPs was mixed with 300μL of 10 mM HEPES buffer at pH 6.8.10 μL of different concentration of dopamine was added, and equilibrated for 90 min at room temperature before the spectral measurements. UV-Vis absorption spectra were recorded using a Varian Cary 300 spectrophotometer equipped with a 1-cm path length quartz cell, and light scattering spectra were recorded by synchronously scanning the excitation and emission monochromators from 300 to 700 nm (i.e., $\Delta\lambda=0$) using an FP-6500 spectrofluorometer, and TEM images were recorded using a FEI TECNAI G2 20 high-resolution transmission electron microscope operating at 200 kV.

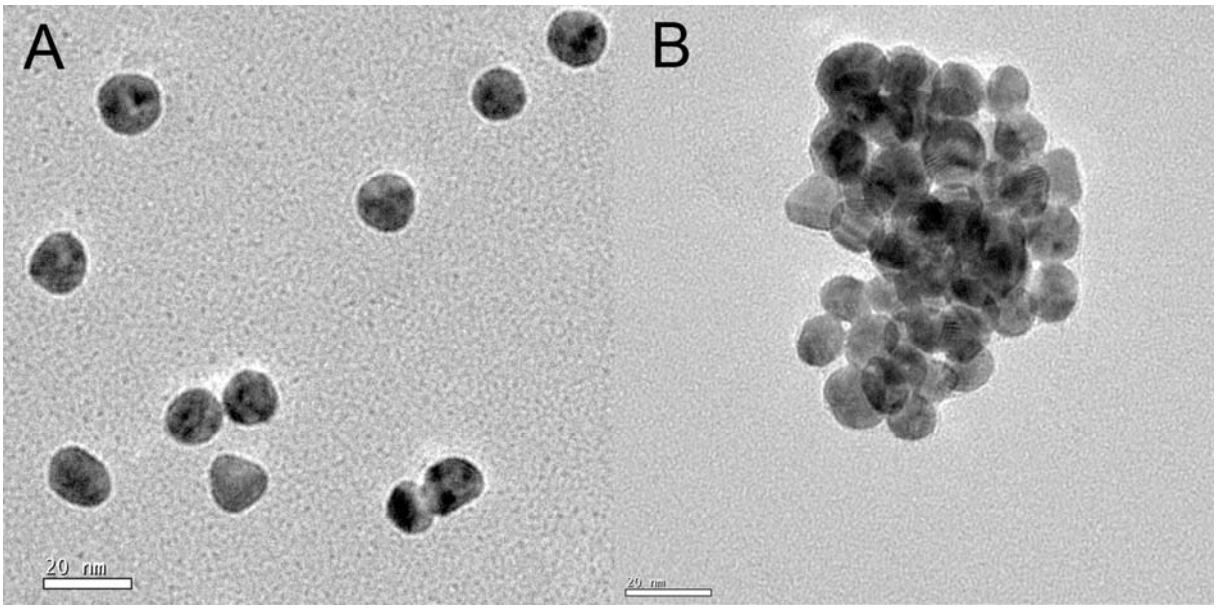

Figure S1. TEM graphs of AgNPs in the absence (A) and presence (B) of 4.0×10^{-5} M dopamine. Scale bars, 200 nm.

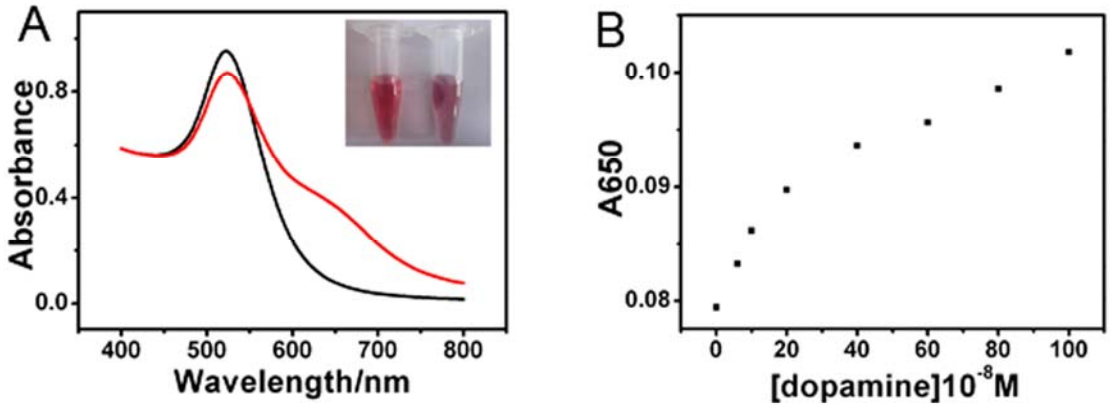

Figure S2. (A) UV-Vis absorption of AuNPs in the absence (Black) and presence (Red) of 2×10^{-6} M dopamine. Inset is the corresponding visual color changes. (B) Plots of the absorbance of AuNPs at 650 nm as a function of the dopamine concentration in the lower concentration range (0–1 μM).

References:

1 R. C. Doty, T. R. Tshikhudo, M. Brust, D. G. Fernig, *Chem. Mater.*, 2005, **17**, 4630.