Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary material

Integration of colorimetric and SERS detection for rapid screening and validation of melamine in milk

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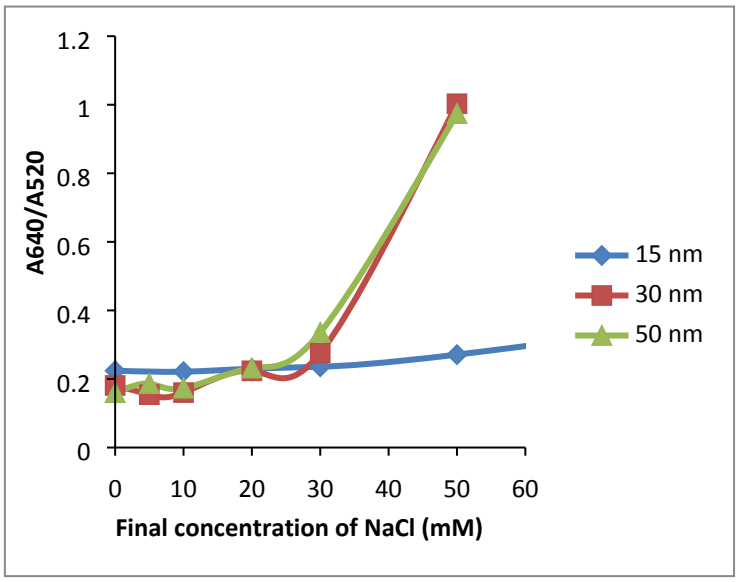

Fig. S1 Optimization of the NaCl concentration. 50 mM was chosen for 15 nm Au NPs, and 30 mM were chosen for both 30 nm and 50 nm Au NPs.

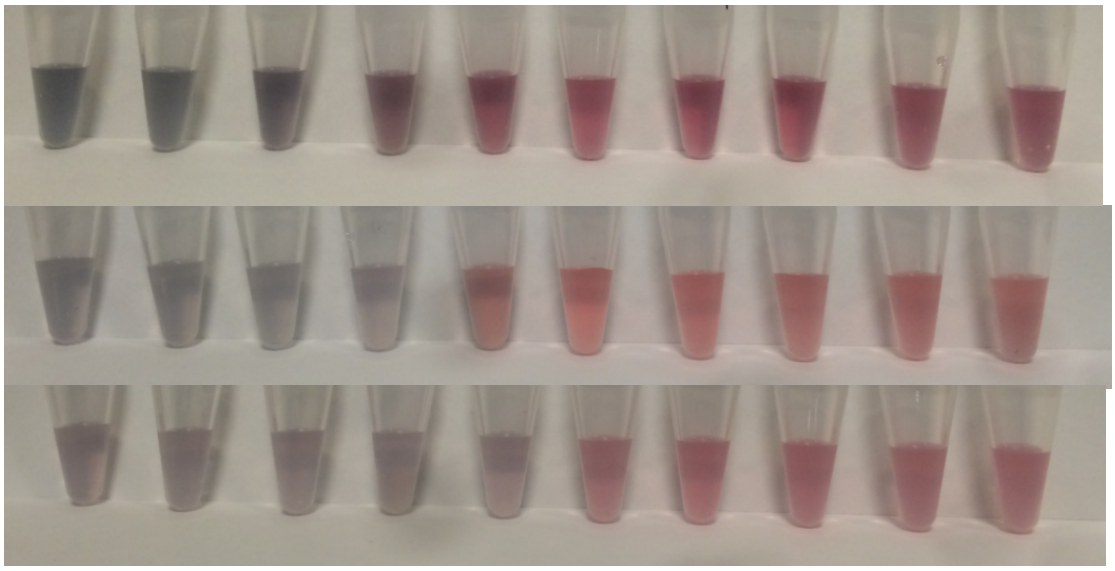

Fig. S2 Visual images of a series of concentrations of melamine in water after adding into Au NPs. From left to right were 10 ppm, 5 ppm, 2.5 ppm, 1 ppm, 0.5 ppm, 0.25 ppm, 0.1 ppm, 0.05 ppm, 0.025 ppm and 0 ppm, respectively. The diameters of the Au NPs were 15 nm, 30 nm and 50 nm

from top to bottom. The same weight concentration of 50 ppm was used, hence there was more Au NPs when their diameters were smaller, causing the darker color of the solutions.

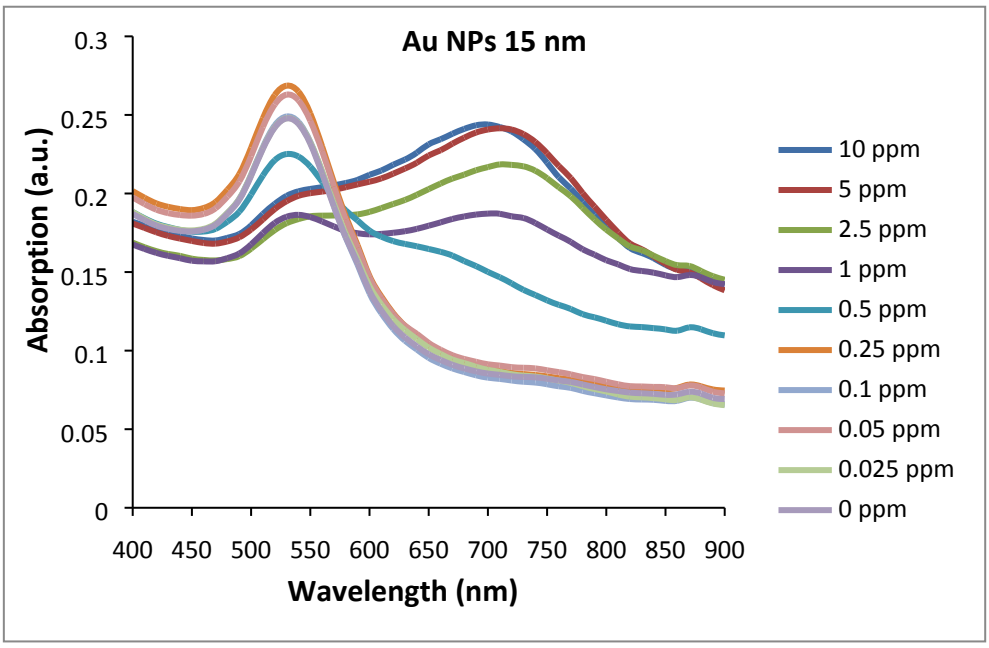

Fig. S3 The evolution of UV-vis absorbance spectra of Au NPs suspension with different concentrations of melamine when the diameter of the Au NPs was 15 nm.

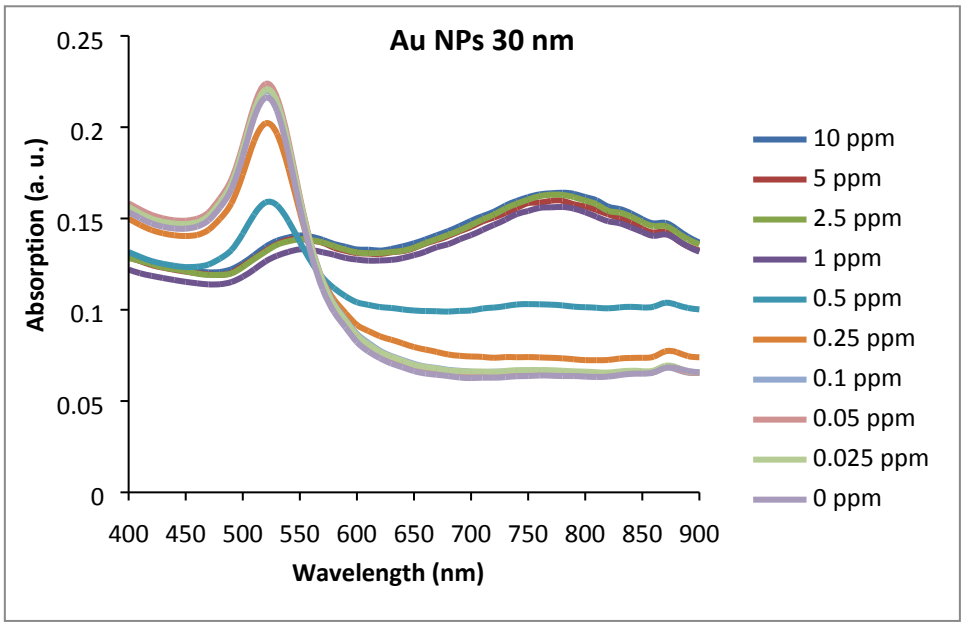

Fig. S4 The evolution of UV-vis absorbance spectra of Au NPs suspension with different concentrations of melamine when the diameter of the Au NPs was 30 nm.

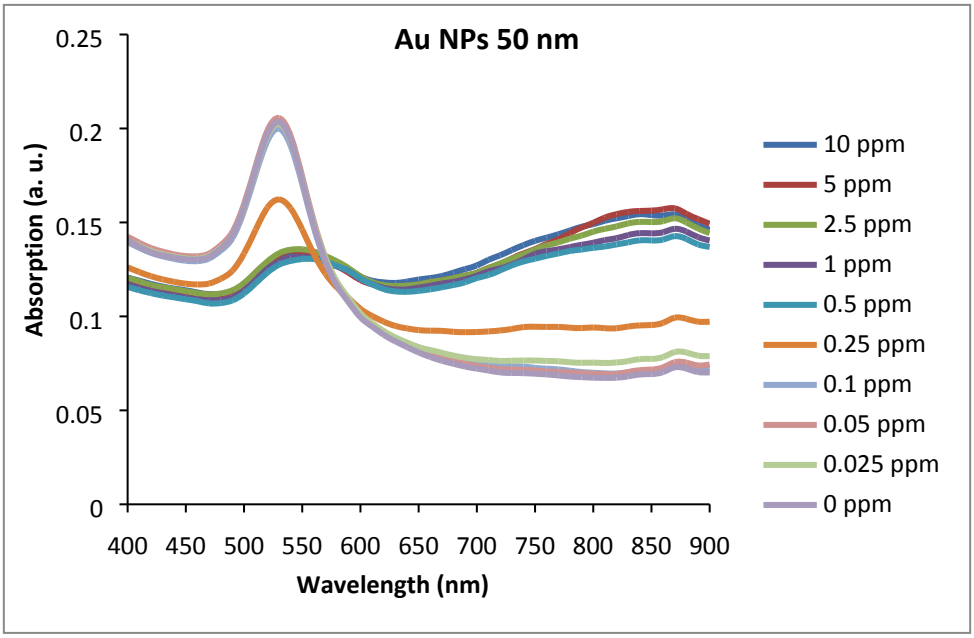

Fig. S5 The evolution of UV-vis absorbance spectra of Au NPs suspension with different concentrations of melamine when the diameter of the Au NPs was 50 nm.

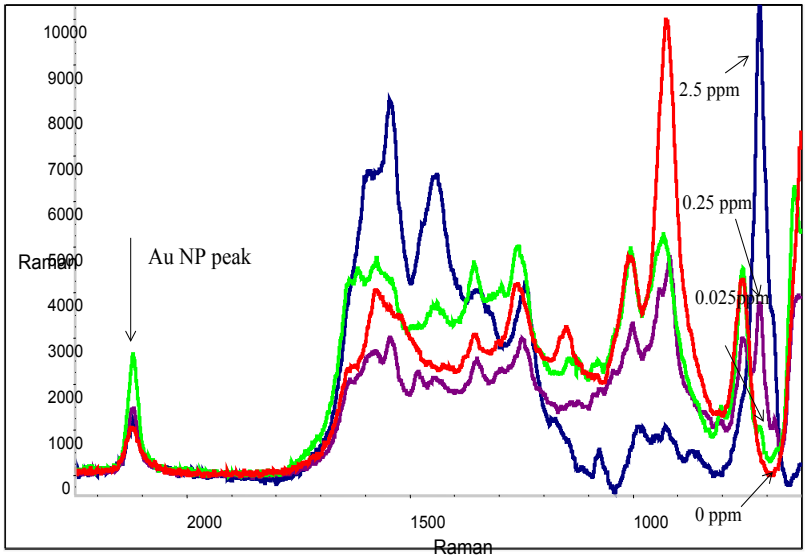

Fig. S6 The measured Raman spectra of different concentrations of melamine in water (0 ppm, 0.025 ppm, 0.25 ppm and 2.5 ppm). The diameter of the Au NPs used was 30nm. The Raman peak of Au NPs was around 2100 cm^{-1}, the Raman peak of melamine in water was around 710 cm^{-1}. In the TQ analyst software, the region for standard normal variate (SNV) calculation was set to from 2000 cm^{-1} to 2200 cm^{-1}. The region for principle component analysis (PCA) was set from 600 cm^{-1} to 800 cm^{-1}.

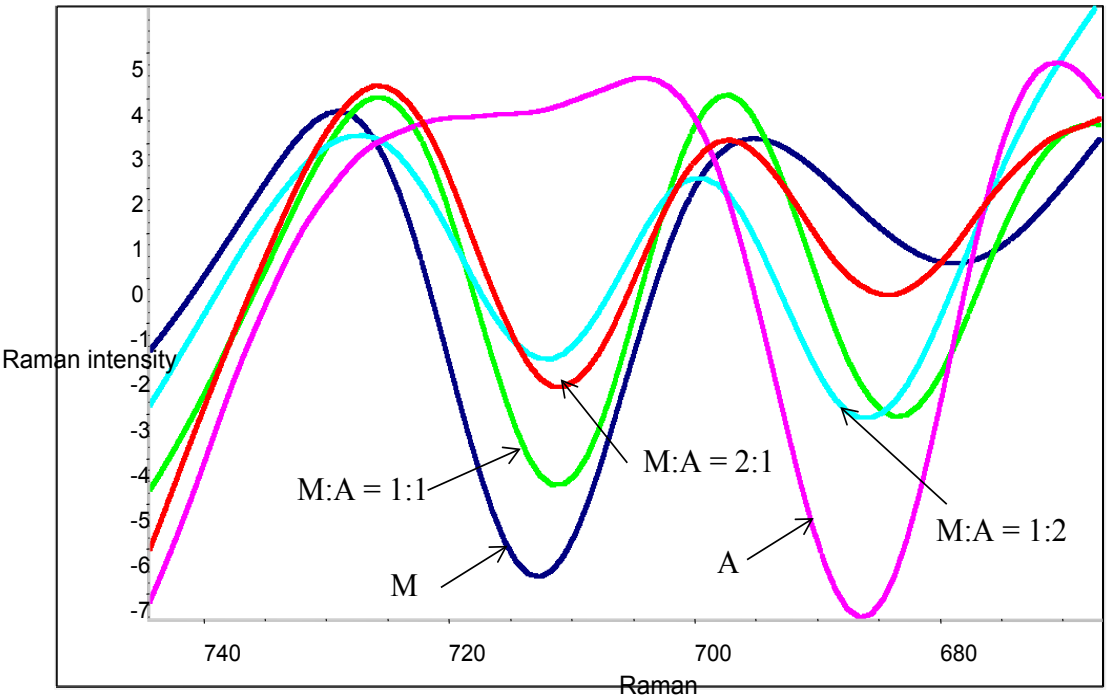

Fig. S7 Statistical spectra for 0.25 ppm melamine, 0.25 ppm acetoguanamine, and mixtures of melamine and acetoguanamine at 1:2, 1:1, 2:1 in water when the diameter of the Au NPs was 30 nm.