

Electronic Supporting information

Colorimetric Detection of Epinephrine Using an Optimized Paper-based Aptasensor

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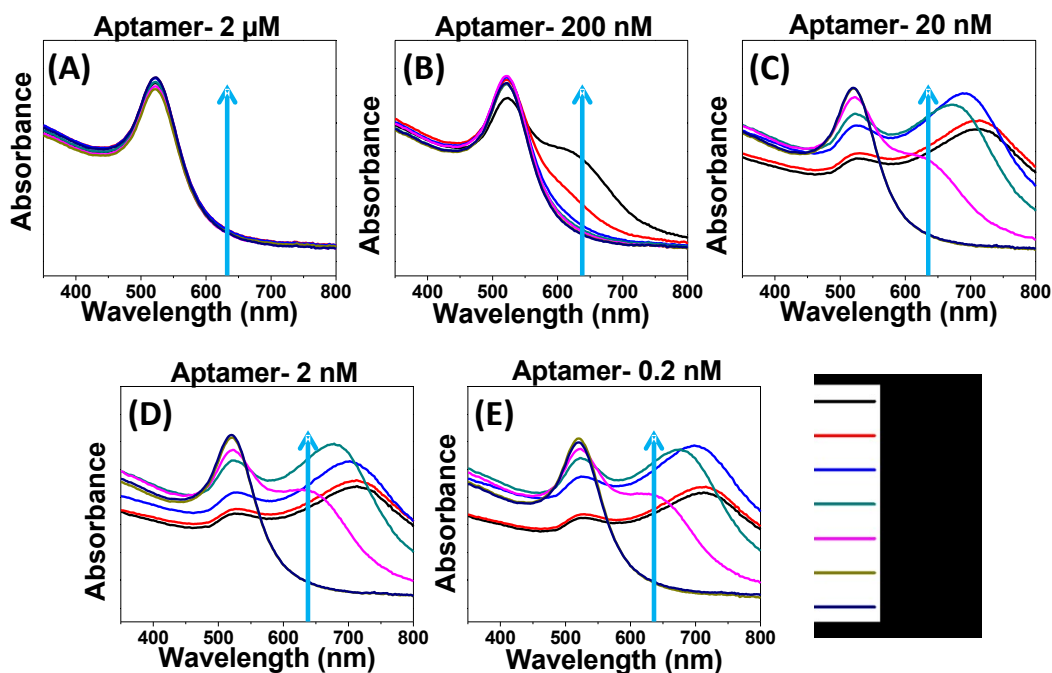


Figure S1: UV-Vis spectra of AuNPs conjugated with different concentration of thiolated aptamers (0.02 nM to 2 μ M) in the presence of Epinephrine (50 ng- 2 μ g). The experiment demonstrates the effect of aptamer and analyte concentration on the aggregation of AuNPs. (A) 2 μ M aptamer concentration causes the gold nanoparticles to be very stable and excess of aptamer in the solution binds to the Epinephrine inhibiting aggregation in the solution. Therefore, no red shift was observed. (B) A slight shift in the peak at 640 nm was seen in the presence of 2 μ g and 1 μ g of Epinephrine when the aptamer is 200 nM. (C, D, E) Similar response was seen for 20 nM, 2nM and 0.2 nM aptamer concentration with an intense shift in the peak at 640 nm. Minimum amount of Epinephrine detected was 200 ng. At 50 ng, the Epinephrine concentration is too low to induce any aggregation in the solution.

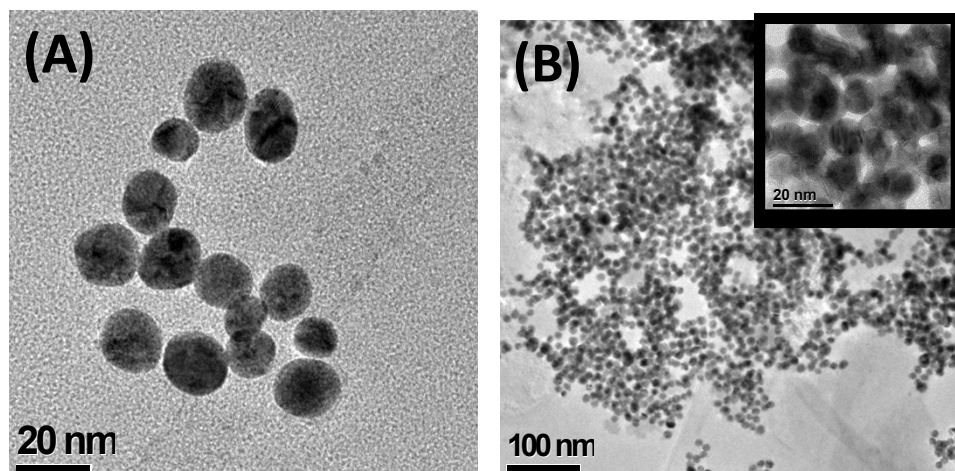


Figure S2: High Resolution Transmission Electron microscope image for (A) uniformly dispersed AuNPs and (B) aggregated AuNPs in the presence of Epinephrine. Inset showing higher magnification with a scale bar of 20 nm.

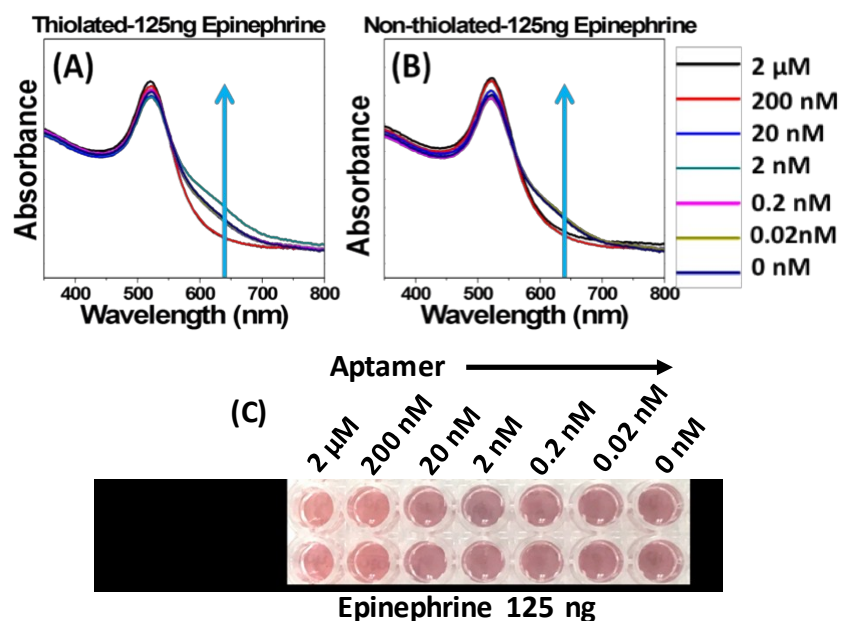


Figure S3: Comparative analysis of thiolated and non-thiolated aptamer at the surface of AuNPs on the sensitivity of the aptasensor. (A) UV-visible spectra for the AuNPs conjugated with thiolated aptamer. The peak for 2 nM aptamer has shown maximum intensity at 640 nm as compared to other concentrations of the aptamer. (B) UV-Visible spectra for the non thiolated aptamers. (C) Visible colour as observed immediately after addition of Epinephrine did not show much colour change as noticeable by the naked eyes.

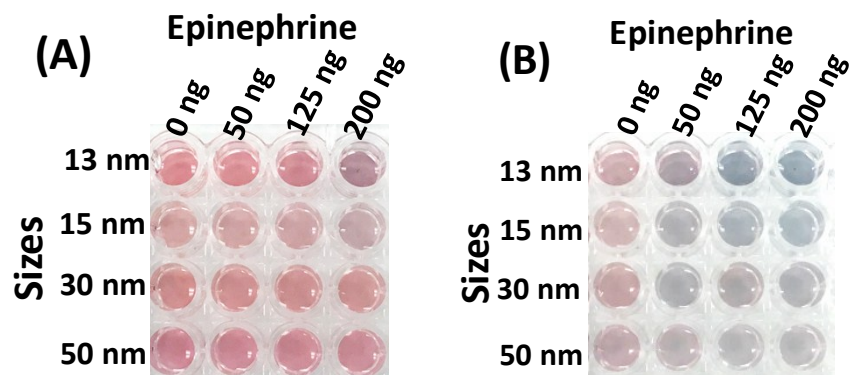


Figure S4: Visible colour change in the solution of different sized AuNPs-aptamer (13 nm, 15 nm, 30 nm, 50 nm) in the presence of different concentration of Epinephrine (50 ng, 125 ng, 200 ng). (A) without salt (B) In the presence of salt (170 mM, 10 μ l). Maximum colour change can be observed for 200 ng for 13 nm AuNPs.