Supplementary Material (ESI) for Chemical Communications

LNA Functionalized Gold Nanoparticles as Probes for Double Stranded DNA through Triplex Formation

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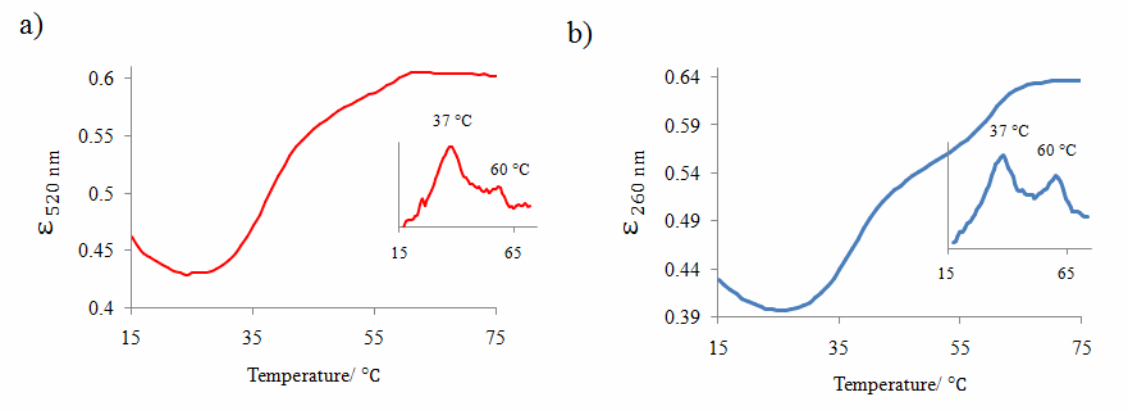
UV-Vis triplex melting curves



UV-Vis triplex melting curves at a) 520 nm b) 260 nm. First derivatives and melting temperatures shown in insets.

Experimental Section

The gold nanoparticles were prepared via citrate reduction of $HAuCl_4$. The concentration of the gold nanoparticles was increased by centrifugation and resuspension to obtain a final concentration of 37.5 nM. HPLC thiol-capped LNA/DNA chimeras with a 20 adenine linker between thiol group and DNA sequence (Eurogentec, Belgium) were added to the aqueous nanoparticle suspension (final concentration of oligonucleotide 3 μM). After 24 hours, the suspension was brought to 10 mM phosphate (NaH_2PO_4/ Na_2HPO_4) by addition of 60 mM pH 7 buffer. Following a further 24 hours, the suspension was brought to 0.1 M NaCl by several additions of 2 M NaCl solution over 48 hours. The nanoparticles were centrifuged to remove excess oligonucleotide and were resuspended in PBS. The final concentration of the LNA/DNA gold conjugates, obtained using UV-Vis spectroscopy, was 10-100 nM.

The nanoparticle assemblies were prepared by mixing the target double stranded DNA (100 nM) with the 2 oligonucleotide probes (1 nM) in 0.5 M PBS buffer, pH 7 at room temperature. The oligonucleotide sequences used are shown in figure 1. Unmodified oligonucleotides were hybridised in a 1:1 ratio (100 nM) in 0.5 M PBS. The melting experiments were conducted by monitoring the change in absorbance at 260 nm and 520 nm, using a Varian CaryWin UV-Vis spectrometer.