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Supplementary Information

DNA-Mediated Assembly of Iron Platinum (FePt) Nanoparticles

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Synthesis of trimethylammonium functionalized 7 nm FePt nanoparticles:

$Pt(acac)_2$ (0.5 mmol) was dissolved in benzyl ether (10 mL) and heated to 100 °C in nitrogen atmosphere. Nitrogen flow was maintained throughout the reaction. At this temperature lauric acid (4.0 mmol), dodecylamine (4.0 mmol) and $Fe(CO)_5$ were added. The temperature of the resulting solution was increased to 240 °C and the reaction mixture was incubated at this temperature for 1 h. Then the reaction mixture was heated further to reflux (300 °C) condition for 2 h. It was later allowed to cool down to room temperature and the nitrogen flow was disconnected at this point. The black colored product was precipitated by adding 20 mL ethanol and separated via centrifugation. The precipitate was then dispersed in hexane (10 mL) in the presence of lauric acid (0.05 mL) and dodecylamine (0.05 mL). These particles were re-precipitated by using ethanol (15 mL) and collected using centrifugation. Finally the purified product was re-dispersed in hexane (10 mL).

20 mg of 7 nm FePt nanocrystals from above were taken in 5 mL dichloromethane. To this 60 mg of 10-carboxydecyltrimethylammonium bromide and 60 mg of 11-mercaptoundecyltrimethylammonium chloride, which was synthesized following the reported procedure,[i] in 0.5 mL of ethanol were added. The dispersion was stirred for three days and the resulting black color precipitate was isolated using centrifugation. The product was purified using repeated washing (three times) with mixture of ethanol and dichloromethane (1:10 volume). Finally, it was dispersed in milliQ water.

Trimethylammonium carboxylic acid synthesis:
11-bromoundecanoic acid (7.5 mmol) was dissolved in ethanolic solution (20 mL) of trimethylamine (4.2 M) and stirred for three days. Solvent was removed under reduced pressure to isolate white compound.

NMR (^{1}HNMR, 400 MHz, D_2O): 3.16-3.26 (m, 2H), 3.0(s, 9H), 2.22-2.32(t, 2H), 1.63-1.75(m, 2H), 1.45-1.56(m, 2H), 1.15-1.30 (m, 12H).

Circular Dichroism (CD): CD experiments were carried out on quartz slides for the native DNA and DNA assembled FePt nanoparticles. DNA assembled FePt nanoparticles show denaturation in comparison to the native form of DNA.

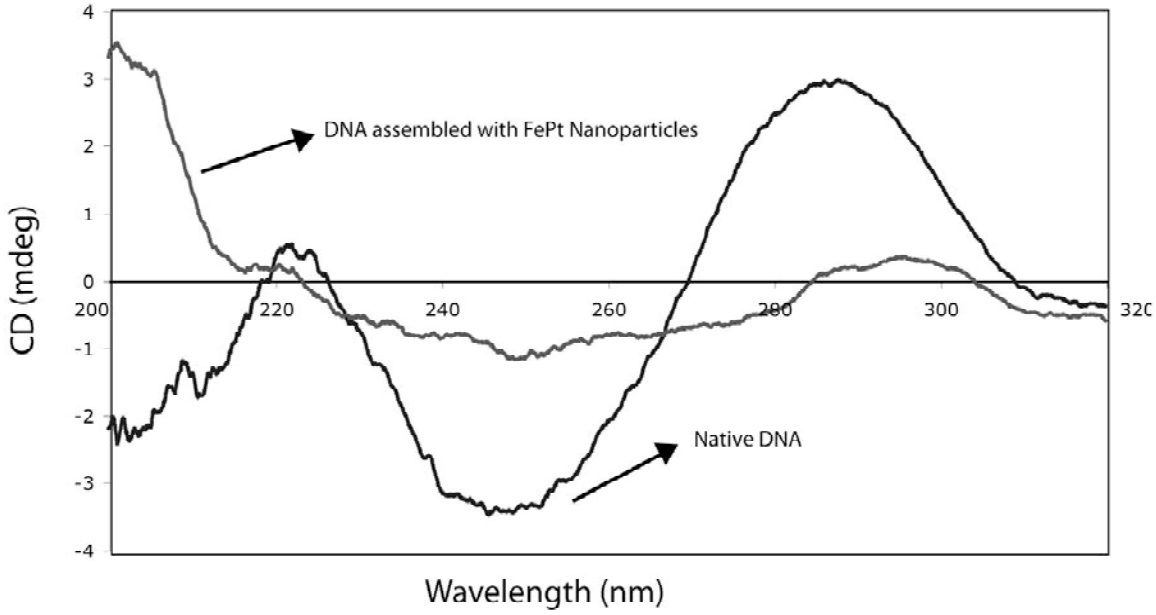

Figure S1: CD spectra for native DNA and DNA assembled with FePt nanoparticles.

i) J. Tien, A. Terfort, G. M. Whitesides, *Langmuir*, 1997, **13**, 5349.