Anti-VCAM-1 and anti-IL4Rα aptamer conjugated super paramagnetic iron oxide nanoparticles for enhanced breast cancer diagnosis and therapy

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Characterization of SPIONs:

Aptamers with amine functional group at the 5′ ends were coupled with carboxylic acid functionalized PEGylated SPION magnetic nanoparticles by EDC/NHC chemistry. 100mM EDC and 25 mM NHS were used as coupling agent in aqueous medium to link the SPIONs and aptamers. The conjugation of the aptamers on the surface of the PEGylated SPIONs were characterized by IR spectroscopy. The IR vibration frequency of carbonyl group from 1725 cm^{-1} to 1650 cm^{-1} As shown in figure S1. After conjugation, the carboxylic acids were converted to amide and the IR absorption at 1725 cm^{-1} and 1650 cm^{-1} were corresponding to the carbonyl group in the carboxylic acid and amide, respectively [26]. The increase in the intensity at 1650 is the convertion of carboxylic acid to the amide after aptamer conjugation.

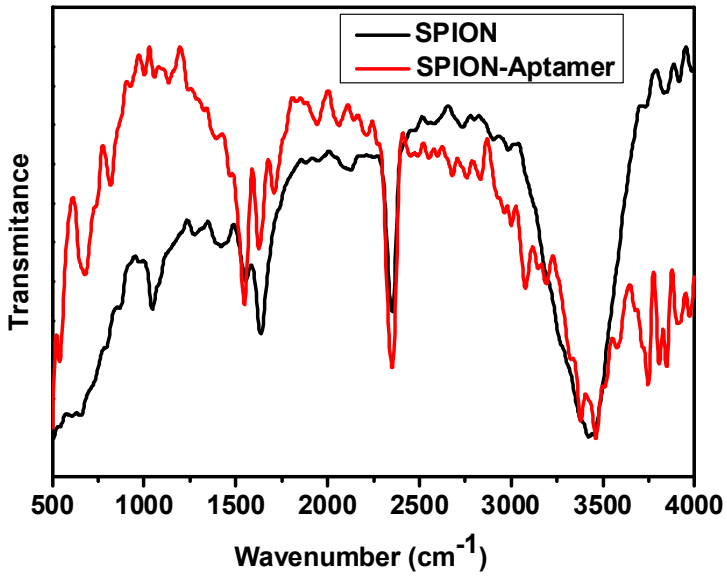

Figure S1: IR spectrum of the SPIONs: The change in the ratio between the intensities of the vibrational frequencies at 1725 cm^{-1} and 1650 cm^{-1} of the SPIONs was observed (i.e. conversion of carboxylic acid into amide).